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Mauro Agnoletti *Editor*

Italian Historical Rural Landscapes

Cultural Values for the Environment and Rural Development

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Editor

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Cultural Values for the Environment and Rural Development

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Foreword by the Director of UNESCO WHC

Landscape, intended as an expression of the complex interaction between society and nature and the stratification of the processes that accompanied productive transformations in the course of time, is one of the most important categories in the World Heritage List. It was introduced in the system of the World Heritage Convention of 1992 under the qualification of "cultural landscape". This category was used by many states in different continents to identify and designate for protection areas of special beauty and great cultural and spiritual value. Today, there are 66 cultural landscapes in the World Heritage List, located in regions and cultures all over the world. They are a testimony to the importance of landscape for the cultural identities of peoples.

In this context, Italy has a very special and privileged role. Its physical morphology, geographical position and rich history have favored the rise, within a relatively small territory, of a remarkable variety of cultural landscapes of extraordinary beauty, with few parallels elsewhere. The National Catalogue initiative is of great importance for our understanding of the Italian landscape and its conservation. Besides, from the point of view of UNESCO, it stands as an example, even outside of Italy, of a methodology that many states could adopt to improve their knowledge of the nature of their landscape and the issues affecting it, as well as their landscape conservation and management systems.

As the Catalogue clearly shows, landscape is a very vulnerable heritage, exposed to threats arising from international economic and social processes that have witnessed a sharp acceleration over the last decades. The crisis of traditional production systems brought about by the globalization of economic exchanges is certainly not the only threat to landscape conservation, but it is certainly the one producing the most dramatic and irreversible effects. The deterioration of the terraced rice paddies of the Philippines, included in the List of World Heritage in Danger, is only an example among many all over the world of the effects of these processes. Even in Italy, many traditional mountain and hill rural landscapes are at risk today. Urbanization and construction for tourism are posing another serious threat to the landscape. As in many other countries in the world, whole coastal or hill landscapes were completely destroyed just in the last two or three decades.

Italy's engagement in the conservation of its landscape heritage, confirmed by its ratification of the European Landscape Convention, requires a collective effort

that must include public administrations, research and education institutions, and the private sector. Today this innovative instrument, offered to us thanks to an initiative by the Ministry of Agrarian and Forest Policies, stands as an important reference for the development of Italy's national landscape conservation policy, which UNESCO will be able to accompany and use in support of its own task of providing technical assistance at the international level.

Francesco Bandarin

Preface

Italy still boasts a rich heritage of rural landscapes built up over thousands of years; landscapes that, while continuing to evolve, still retain evident testimonies of their historical origin and maintain an active role in society and economy. These landscapes are indissolubly tied to traditional practices handed down from one generation of farmers, shepherds and woodsmen to the next, complex sets of ingenious and diversified techniques that have contributed in a fundamental way to the construction and conservation of our historical, cultural and natural heritage. These techniques were a means to continuously adapt to difficult environmental conditions to provide multiple goods and services, and thereby improving people's standard of living as well as giving rise to landscapes of great beauty. Landscape heritage and the related traditional knowledge are fundamental resources that need to be safeguarded. The speed and extension of the technological, cultural and economic changes that have taken place over the last few decades are threatening landscapes and the rural societies associated with them. Multiple pressures are constraining farmers innovation, this often leads to unsustainable practices, resource depletion, productivity decline, and excessive specialization, placing the preservation of landscapes as an economic, cultural and environmental resource in serious jeopardy. The result is not only an interruption in the transmission of the traditional knowledge required for local landscape maintenance, but also socioeconomic destabilization of rural areas and a loss of competitiveness of agriculture. This work intends to lay a foundation for the identification, conservation and dynamic management of historical landscape systems and traditional practices, in the face of economic, environmental and cultural globalization, climate changes, and inappropriate policies, in view of the creation of a national register of historical landscapes and traditional practices.

Nowadays we are witnessing increasing interest in landscape at the European level, as stated by the European Landscape Convention[1], signed in Florence in 2000, which addresses the deep changes in course in modern society. As Roberto Gambino

[1] The research has received the patronage of the Council of Europe for its contribution to the implementation of the European Landscape Convention. Article 6.C.1 of the convention requires identification and assessment, which states that each party undertakes: to assess the landscapes thus identified, taking into account the particular values assigned to them by the interested parties and the population concerned.

explains, the need to preserve the identity and meaning of places expressed by the current "demand for landscape" reflects a deeper malaise that certainly has to do with globalization processes and their effects: on the one hand, homologation and modernization; on the other, imbalances and inequalities, that need to be addressed.[2] In this perspective, the introduction of landscape as a strategic objective of the national rural policies, reflects a change in the conception of the role of this resource, as well as that of rural territory in general. The role of landscape and its perception has indeed changed over time. Today it is no longer an elite aesthetic and cultural construct, isolated from its socioeconomic context; it has become, instead, an essential element in the definition of an adequate development model for the national rural context.

The prevalence of aesthetic considerations in past conceptions of landscape, as well as the more recent approaches studying and managing landscape with the same scientific tools used for nature conservation, has led to an emphasis on deterioration caused by urban dynamics, industrialization, as well as to criteria for the assessment of landscape quality based on ecological characteristics, reductively understood as its flora and fauna, or as a series of natural habitats. All this has pushed in the background both the strong human print on the Italian landscape and the fact that, while urban expansion certainly played a role in this, the transformation of the rural landscape was largely endogenous, something that few have remarked. While it is evident, as Emilio Sereni explained,[3] 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", it is equally evident that not all agricultures produce good landscapes, especially considering industrial agriculture. Unfortunately, as is confirmed by the data presented in the chapter on vulnerability, ordinary conservation legislation based on nature conservation, protected area systems or landscape restrictions are not only ineffective as a means to preserve the rural landscape, but are instead favoring abandonment and degradation. It is this realization that persuaded all of the scholars who contributed this to research of the need to draw it up, and that it is finally time for the issue to be addressed by agricultural policies. Conserving the quality of a rural landscape, which by its own nature is always evolving, can only be done by setting up a socioeconomic system capable of supporting and reproducing it; hence the decisive importance of strategies and actions undertaken in the framework of agricultural policies. The new guidelines for rural development policies associating them with local development are a major step forward in this direction. The objective is to make the most of all the resources of rural areas, emphasizing the local dimension, the new role of farmers, and the involvement of new actors in the social and

[2] Gambino R., Ambiguità e fecondità del paesaggio, in: Quaini M. (1994), ed., Il Paesaggio fra attualità e finzione, Cacucci, Bari.

[3] Sereni E. (1961), *Storia del Paesaggio agrario italiano*, Laterza, Bari. A broad discussion of Sereni's scientific legacy has been lacking so far. For different possible views, cf. Moreno D., Raggio O. (1999): Dalla storia del paesaggio agrario alla storia rurale. L'irrinunciabile eredità scientifica di Emilio Sereni, Quaderni Storici, n. 100, 89–104.

geographical space designated today as "rural".[4] Important landmarks for the rise of this new vision of rural policies in Europe were the *Rural White Paper* published by the English government in 2000 and the *National Agenda for a Living Countryside* produced by Holland (2004), but a growing interest in landscape is evident in the development of the European Common Agricultural Policies. However, at international level, relevant institutions are today offering important political and scientific opportunities for putting this work into a larger framework. The Globally Important Agricultural Heritage Systems projects managed by FAO is actually developing a similar approach, with the aim to identify rural landscapes all over the world. On the other hand the recent Joint Program between UNESCO and CBD on biocultural diversity is finally recognizing that traditional rural landscapes, especially those having a long history, basically presents not a "natural biodiversity", but rather a biodiversity resulting from the reciprocating influence between man and nature over the time. It is interesting to note that even in the forest sector, usually concentrated on the natural, climatic and economic role of the Forest there is a growing interest in understanding the role of traditional knowledge and traditional landscapes[5]. This evidence suggest a new direction for research, not any longer concentrated in introducing more nature in the countryside or in separating nature from humans considered as a factor of "disturbance" for the ecosystem. There is rather the need to finally integrate man and nature into a different paradigm including environment, society and economy, but also to find good examples of this integration. This research is an attempt to locate this areas and study them as good cases for small scale production strongly linked to their landscapes, as good examples of adaptation to difficult and changing climatic conditions, of biodiversity due to human action, but also for the fundamental role played by farmers in preventing hydrogeological risk. Last but not least, the quality of life of rural and urban population largely depend on the quality of the rural landscapes and it is good news that the National Statistical Agency has finally decided to introduce the quality of rural landscape as an indicator for the well being of the Italian population.

In the local dimension of Italian rural policies, the landscape dimension plays a paradigmatic role, as it corresponds to the transition from individual business or agricultural sectors, to at territorial scale, for which a landscape-oriented approach is undoubtedly more suitable, because of the peculiar characteristics of our country, than an industrial or environmental one, even in a development perspective. Indeed, today the notion that conservation is an obstacle to development in any form has given way to the realization that conservation is instead one of the new faces of innovation in contemporary society. An authentic innovation is one that adds to a store of values slowly accumulated over the ages. Conversely, there can be no

[4] Ploeg J.D. Van Der (2006): Oltre la modernizzazione. Processi di sviluppo rurale in Europa, Rubettino, Cosenza.

[5] The research work on this subject is carried out by the Research Group on Forest History and Traditional Knowledge of the International Union of Forest Research Organization (IUFRO), chaired by the author. See also: Parrotta J.A., Trosper R. L., editors, Traditional Forest- Related Knowledge, Springer Verlag, Dordrecht, 2011.

authentic conservation without the production of new values. In this perspective, the restoration and promotion actions implemented in Italy by the recent National Rural Development Plan (2007–2013) have already introduced instruments by which the Italian regions can begin to modify the orientation of Rural Development Programs to address landscape issues. The reorganization of the Italian ministries, occurred in 2012, has allowed the Ministry of Agriculture, Food and Forestry to take the responsibility of the policies for the rural landscape, this is an important change since the whole Italian landscape was under the rule of the Ministry of Culture. In this new perspective, the current register has offered the background for a new law proposal for establishing the National Register of Traditional Rural landscape and traditional practices, currently under way, as well as the already approved law for the restoration of rural landscape that will be discussed further on in this text. These initiatives marked an important change in Italian history, since rural landscape, as a part of the National Cultural Heritage, has always been managed by the Ministry of Culture, affecting also the legal framework concerning planning, management and conservation of rural landscape.

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Part I
Scientific Approaches and Research Findings

Chapter 1
Italian Historical Rural Landscapes: Dynamics, Data Analysis and Research Findings

Mauro Agnoletti

1.1 The Need for a Register

One of the first questions that the scientific committee needed to answer when proposing this research to the Italian Ministry of Agriculture Food and Forestry, was why we needed a national register of the rural landscapes, in these difficult times of economic and social crisis, that seems to pose more urgent matters in the political agenda. Several different answers could be given to this question, since several different reasons induced a large group of scholars working in different domains to undertake this work.[1] Let me just point out a significant and fairly obvious one. After over half a century of an industrial agriculture which has deeply transformed our countryside, after decades of Common Agricultural Policy (CAP) which have placed our land and environment under extreme pressure, it has become urgent to draw a balance and provide a general assessment of what remains of one of the most diverse and aesthetically compelling landscapes in Europe and the world, and one of the richest in agricultural biodiversity. On the other hand, it is worth noting that since the end of the 1980s Common Agricultural Policy has started to limit and regulate the use of land and its agricultural transformations by means of milk quotas and set-aside plans—that is, putting the less productive land to rest. The same is being done today in viticulture, as well.

Although these decisions are presently being called into question, partially or totally, we should not overlook the fact that this is a caesura of historical significance. The race to unlimited productivity has come to an end almost 20 years ago. Although the logic of industrial agriculture remains unmodified—even after having contaminated the environment with chemical pollutants and destroyed woods and

[1] I wish to thank Piero Bevilacqua, one of the members of the scientific board, for permission to use the text of his chapter "Perché un catalogo", in M. Agnoletti, *Paesaggi rurali storici. Per un catalogo nazionale*, Bari: Laterza, 2010, from which the present introductory chapter is taken.

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pastures for centuries to free up new land for intensive exploitation—today a supernational authority is invoking and imposing limitations on the agricultural use of land. Thus, like other countries in the Old Continent, Italy now finds itself within a supernational normative framework which regulates, limits and manages the evolution of agriculture according to a general political project. Solitary actions by agricultural entrepreneurs manipulating the land for their individual needs are thus becoming less and less conceivable. So today the evolution of the agrarian landscape appears to be occurring increasingly in the context of large-scale continental planning with an active involvement of the affected social groups, local populations in general, and public opinion. This general vision, which is now finally able to detect the increasingly evident connections between strictly productive agricultural activities and the environment, the landscape and biodiversity, induces us to regard our countryside no longer merely as a productive resource, but as a complex system of functions and values.

In this regard, it is worth remembering that one of the indirect effects of industrial agriculture itself—in spite of often irreversible damage inflicted on traditional landscapes—was to reduce the used agricultural surface, leaving extensive areas unexploited and, thus, fixed in their traditional characters, although these are not always well preserved. As Giuseppe Barbera[2] recently wrote: "Over the last 60 years, Italian agricultural landscapes have followed two routes, that of abandonment and that of specialization. The former led to degradation, landslides and fires, especially in mountain areas; in some cases, where the environment was not excessively compromised, to a return to nature. The latter led to the prevailing of monocultures in the most fertile areas: simplified and homogeneous systems and landscapes, often composed of a single plant species, where . . . mixed cultivation was eliminated, dismissed as a useless leftover of the past in an agriculture designed to pursue only economic ends".

Finally, it is also important to mention that the European Union explicitly designates landscape as one of the original assets of the Old Continent, to be regulated and protected (in the European Landscape Convention of 2000 and in several other subsequent legislative acts). Since the institution of the Natura 2000 Network under the Habitat Directive (EC Directive 92/42) at the end of the last century, the issue of the protection of individual natural sites, biodiversity, and birds appears increasingly inseparable from that of the protection of traditional agricultural realities, land management systems, and the landscape. Likewise, since the year 2000 Rural Development Plans engaging the various states of the Union and their regions have been providing a new stimulus to the conservation and promotion of the historical features of our rural landscapes. Thus, in the face of these multiple and converging impulses, it appears ever more urgent to undertake a survey aimed at drawing up a vast inventory of the historical legacy we have inherited in the countryside and rural areas, comparable to a register of unique and non-reproducible artistic heritage (Fig. 1.1).

[2] Barbera G., 2007, *Tuttifrutti. Viaggio tra gli alberi da frutto mediterranei, fra scienza e letteratura.* Mondadori, 2007, pp. 105–106.

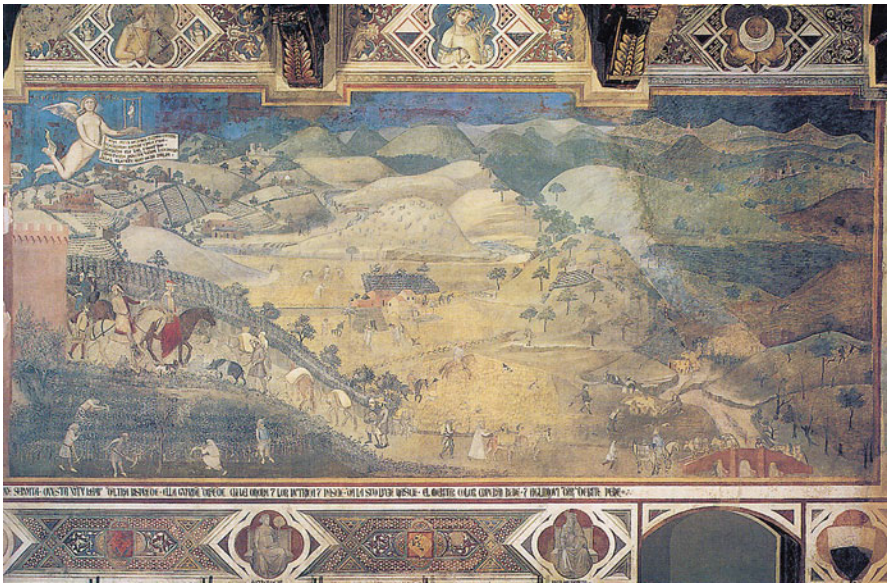

Fig. 1.1 *The Effects of Good Government on the Country* is a fourteenth-century painting by Ambrogio Lorenzetti (Siena, Palazzo Comunale). Most of the landscapes described in the register originated in the Middle Ages, a period when the Italian "Bel Paesaggio" started to be represented by many artists and described by foreign travellers. The notions of "good government" and *bel paesaggio* evoke careful management of the countryside, as opposed to its abandonment and reverting to a wilderness after the fall of the Roman empire. Fine-grained landscapes with the appearance of gardens became widespread in this period, especially in central Italy, thanks to the sharecropping system. Fields usually had high numbers of trees and hedges, resulting in what is known as "mixed cultivation".

The reason why we need a register, first of all, is because we need to take a census. Our rural landscape is an elaborate and inseparable heritage of historical, artistic and natural beauties. As such it should be preserved, insofar as this is possible, as an integral whole. This is why we need an inventory, even a summary and exemplificative one, of the extension, characteristics, variety, distribution etc. of Italy's landscape; an inventory providing a "living map" of the most significant articulations of this boundless heritage.

As one can easily imagine, a register can facilitate active protection and promotion; for example, by indicating areas that are more degraded that others and where more adequate and stable environmental and agricultural balances need to be restored. At the same time, it makes possible public support to traditional agriculture, especially in inland hill and mountain rural landscapes that still retain their historical value as sanctuaries of agricultural biodiversity and preservers of the hydrogeological balance. Finally, the register has an evident cultural value. It will end up in citizens' hands, promoting a higher degree of awareness in their enjoyment of the multiple resources offered by our landscape.

Fig. 1.2 1:250,000 map of the Italian territory resulting from an interpretation of Corine Level 4 data. The map highlights the result of the abandonment of the mountains and the polarization of the landscape, which today appears divided between forest areas (in *green*), prevalently located in mountain areas, and agricultural areas (in *beige*). Although the adopted scale overemphasizes the phenomenon, socioeconomic dynamics have indeed undermined the historical integration between woods, pastures and agriculture, reducing the complexity of Italy's landscape mosaic and biodiversity by favoring, instead, simplification and structural homogeneity. (The map was produced by the "Carta degli aspetti paesistici d'Italia" project of the Department of Environmental and Forest Science and Technology of the Faculty of Agricultural Studies of the University of Florence, directed by Prof. Orazio Ciancio. Cf. Agnoletti 2010, cit.)

It goes almost without saying that this register could also stand as an important cultural bastion from which to begin to defend with more energy and civil rigor that in the past our landscape heritage from the incessant vandalic aggressions of the infinite host of a certain "development" model. Understanding our landscape with its natural and historical peculiarities, as a result of specific events and original technical approaches, and a repository of culture and knowledge deeply stratified and sedimented through time, should help to make our land, as it were, "sacred": an immense site of rural archaeology, which cannot be modified or manipulated without a general consensus. All who reject a culture that only grants value to things when they are transformable into commodities, when they can generate immediate profit, may find reasons for commitment in the defense of the Italian agricultural landscape (Fig. 1.2).

This register intends to highlight and document the historical character of the Italian agricultural landscape. Actually, the term "historical" in itself is not especially significant semantically. All areas that have been anthropized for a few decades can be legitimately said to have a historical footprint. But the landscapes of Italy, as we well know, reach back far beyond this minimal threshold. What distinguishes the complexity of the historical character of the Italian peninsula's landscape—even compared to other European landscapes that were anthropized in ancient times—is the multiplicity and stratification of the footprints left by so many distinct civilization on our countryside. We only have to think of the changes determined by land reclaiming works carried out by Greek settlers, Etruscans, Romans and Arabs. In the course of time, these same civilizations provided such an incomparably vast contribution to our agriculture, in the form of new plants species, cultivation techniques, plantation and land delimitation methods, water collection and use, and buildings and land works that the historical character of our landscape acquired a special value compared to that of other European countries. We should also not forget that, just as a landscape merges in an original synthesis the beauty of a site or plantation with the historical character of its use and manipulation for economic purposes, the buildings scattered in our countryside, immersed in the most diverse habitats, are at once documents of past agrarian civilizations and artistically valuable constructions, aesthetically prestigious works, admirable for their magnificence and the genius of their builders. I am thinking of the many courtyard farmhouses (*cascine*) scattered around the Po River Plain, the *casali* and farmhouses of the hills of Tuscany, Umbria and Marche, and the rock buildings and *masserie* of southern Italy, Sicily and Sardinia.

The Roman *centuriationes* and the geometric layout of so many roads and areas—as well as invisible works that often escape immediate detection and which archaeological research has begun to discover only recently—are also an integral part of our agrarian landscape, as they are in some farmlands elsewhere in Europe; although in Italy their variety and richness of form is without parallel. We only need to think, to mention a significant example, of the check dams on hills and mountains by which the Romans harnessed the upper courses of torrents and thus remodeled the land. Some of these—like the check dam of Lugnano in Teverina, in Umbria—have continued to perform their function of protecting land stability down to this day[3]. But our landscape holds in its bosom an infinite number of buildings and structures which in some cases are themselves artistic heritage worthy of specific protection: for example, Roman aqueducts, and bridges, roads, canals, cisterns, fountains and wells from various periods. Rural architecture itself, an expression of multiple forms of organization of agricultural life, offers a rich and varied repertoire, as I observed above: open and closed-design *cascine*, farms, villas, *casali*, *masserie*, mills, barns, cellars, oil mills, stables, pigsties etc. Of course, this kind of heritage is not recorded in the present catalogue. Its inclusion would have involved a much vaster scope for our research, whose costs of publication would hardly have been sustainable. Here we have focused, instead, on the more strictly agricultural aspects of the Italian landscape.

[3] Bevilacqua P., Sull'impopolarità della storia del territorio in Italia, in P. Bevilacqua and P.Tino (eds), *Natura e società. Studi in memoria di A. Placanica,* Donzelli Roma 2005.

Last, but certainly not least, is another decisive aspect of the originality of the Italian agrarian landscape. Emilio Sereni distinguished our landscape by defining it as vertical compared to the horizontality dominating other European landscapes characterized by extensive plains. Indeed, terraces and various ways of growing crops on hill slopes have given our agriculture a remarkable "vertical" physiognomy. There is no doubt, however, that the uniqueness of our rural landscapes depends on the incomparable variety of the natural habitats that the Italian peninsula houses in its bosom. From the Alps to Sicily, a continuous diversity of climates, rainfall regimes, morphologies, soil composition, and plant varieties forced the various agrarian civilizations that settled the peninsula to express their space-modeling and settlement-planning cultures in a variety of forms. This variety, however, also presented them with the opportunity to draw on an incomparably rich biological heritage of plants—a legacy of centuries of contributions by different and sometimes distant agronomic cultures—to make the most of the climatic and environmental variety of the peninsula. It is this centuries-long, incomparable history that we wish to give a testimony of by presenting some of the most significant Italian sites that survived the Great Transformation of the twentieth century.

1.2 Modes of Investigation

Our research is not meant as an exhaustive overview of Italy's landscape heritage. Rather, it intends to contribute to the development of a methodology for the identification and classification of landscapes of historical interest, and, at the same time, to provide a preliminary sample of the substance and state of the country's landscape heritage. This will hopefully be a first step in the drawing up of a true comprehensive inventory of the Italian rural landscape, on the desirability of which there appears to be a wide consensus today among both scholars and agricultural policy makers[4]. We decided not to focus on the strictly environmental features of Italian rural landscapes—climate, geomorphology, vegetation—since these have been examined in depth in existing literature. We strove, instead, to take a more detailed look at the structure and organization of rural landscapes. Thus, we did not focus on ecological and naturalistic aspects, nor aesthetic ones, although these are also mentioned in the individual area descriptions. Rather, we adopted as our landmark Emilio Sereni's pioneering work (1961), which examined the "forms" impressed by man on the natural substrate, but left open the question of their characterization and conservation at the national scale. Our purpose was to carry forward Sereni's work by combining traditional historiographies of agriculture, forestry and, more in general, the landscape with approaches highlighting the material elements of landscape structure, as

[4] The Italian Ministry of Agriculture, Food and Forestry have financed the research through the working group on landscape, established in the framework of the National Plan for Rural Development 2007–2013. The Working Group on Landscape is chaired by the author. The activities of the WG concern the development of strategies and actions for landscape policies, research activities, publications, organization of conferences and workshops.

found in important studies by European scholars, especially English ones such as Oliver Rackham,[5] and also in some remarkable investigations conducted in Italy by work groups led by Diego Moreno on the agropastoral sector and Pietro Piussi on forests[6].

Our project's board of advisors gathered scholars with competences in the domains of history, geography, agrarian and forest science, and architecture. Coordinators were nominated for one or more regions, each of whom selected collaborators to conduct investigations at the local scale. About 80 researchers from 14 universities thus contributed to the catalogue, as well as some professional studios and independent researchers. An international committee of experts was formed to assess the work. Some foreign institutions were also involved in the project, including the Committee for Cultural Heritage and Landscape of the European Council, the European Society of Environmental History (ESEH), and the International Union of Forest Research Organizations (IUFRO; Fig. 1.3).

One of the methodological problems we had to deal with in the initial stage of our research was the definition of its spatial and chronological scale. As regards the chronological scale, no limits were set. The origin of the landscapes under investigation was traced as far back as available sources allowed. As regards the spatial scale, we decided to analyze areas with extensions between 500 and 2,000 ha, large enough, that is, to include management units such as the typical Italian sharecropping farm or the latifundium, and to encompass spatial relationships between land uses, in consideration of the importance of the spatial scale in UNESCO parameters for world heritage sites. In the area descriptions, we decided to indicate only the geographical coordinates of the center of each area, leaving the construction of a GIS database to a later stage. The main reason for this was the difficulty, which I will discuss further on, of accurately determining the geographical boundaries of areas with non-contiguous cultivated zones.

Each area was illustrated in a separate descriptive text. The information provided in the individual area descriptions was then summarized in the texts that appear in the present book. Although the area descriptions were based on a common template, due to the many different competences of the scholars involved in the research, there were differences in individual sections of each description. The collected information was hence homogenized to make the published descriptions of equal length and make sure they contained the same kind of data, also to the purpose of making them more easily comparable. It is important to specify that the photographs in the present book are meant as an accompaniment to the text, but are not themselves the object of the catalogue. They are meant as a support to the descriptions, not having been

[5] Rackham, O., 1986, The history of the countryside, J.M. Dent & Sons Ltd., London.

[6] Moreno D., 1990, Dal documento al terreno, Il Mulino, Bologna; Piussi P., 1996, Continuità e trasformazione del paesaggio forestale: problemi e metodi della storia ecologica dei boschi. Istituto Internazionale di Storia Economica "F.Datini", Atti della XXVII Settimana di Studi: L'uomo e la Foresta, secc. XIII–XVIII, Prato 8–13 Maggio 1995, edited by S. Cavaciocchi, Collana Atti delle settimane di studi ed altri convegni n 27, Firenze.

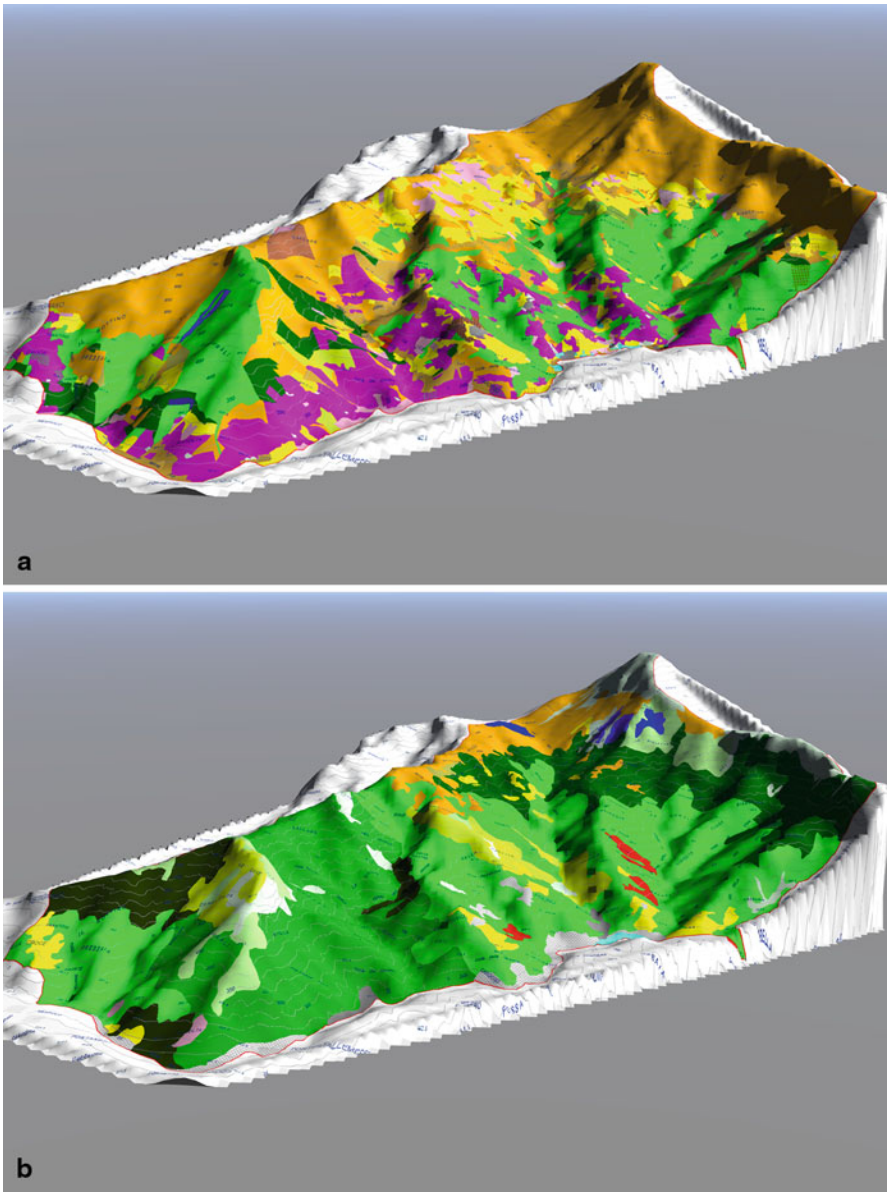

Fig. 1.3 The two maps show the land use of Pania della Croce Mountain (Tuscany) in 1832 and 2002. Woodlands are marked in *green*, arable land in *yellow*, vineyards in *violet*, and pastures in *orange*. 67 land-use classes organized in 618 patches are recorded in 1832 in an area of 1,000 ha. In 2002, woodland covers most of the area, the land uses are down to 18 and the landscape patches to 84. The increase of woodlands and the reduction of cultivated land is the result of abandonment of the mountain by the local population. The reduction of landscape diversity also entails a strong reduction of biodiversity, especially biocultural diversity. The areas marked in *red* indicate landslides resulting from the interruption of the management of terraced cultivations

taken with the highlighting of aesthetic parameters in mind. This reflects the general approach followed in this work, which is to highlight mostly the historical character of landscapes in connection with aspects such as aesthetic quality, typical products, tourism, and biodiversity. For this last parameter, in consideration of the importance today of linking historical dynamics to the theme of biodiversity, I refer the reader to Diego Moreno and Roberta Cevasco's essay, and to Tiziano Tempesta's essay for another crucial aspect, viz., that of economic value.

In the initial phase of the project, we sent out requests for collaboration to all the departments of agriculture, urban development and culture of the Italian regions, to the presidents of autonomous provinces, and to the Superintendencies of Architectural and Landscape Heritage. We received replies from 14 out of 20 of the regions we had contacted, although there were significant differences in the quality of their subsequent collaboration. In some cases, for example in Valle D'Aosta and the autonomous province of Bolzano, the local administrations took the task of singling out areas suitable for selection wholly upon themselves; in others, such as that of Lombardy, the investigation was carried out as a close collaboration between the department of urban planning and the university. In other cases, our coordinators were able to draw directly on data previously gathered in studies conducted by regional governments for their own land planning purposes. Significantly, this phase of the project again highlighted the insufficient integration of urban planning and rural development, two sectors that more often than not work independently of one another in spite of the fact that they are managing the same resource. The question is dealt with in Alberto Magnaghi's essay, which illustrates the problematic of the planning of rural landscapes, a pressing issue today, especially since landscape plans today are drawn up in observation of the guidelines of the Cultural Heritage Code. Requests for collaboration were also sent to the superintendencies of landscape heritage depending from the Ministry of Cultural Heritage, but from these rarely received a reply. By the end of the first 12 months of the project, about 135 areas had been singled out. The number of areas per region in the present volume varies from a minimum of 4 to a maximum of 8, which were the limits we set for local researchers in their choice of representative areas. We tried to reduce the effect of differences in the relative abundance of historical landscapes between one region and the other by carefully employing selective criteria.

1.3 The Major Transformations of the Rural and Forest Landscape of Italy from its Unification to the Present Day

For the reader to fully understand not only the situation "photographed" by our catalogue, but also the urgency of such an investigation, I need to briefly go over the evolution of the Italian rural landscape since the country's unification, not so much in terms of socioeconomic changes, but rather as regards land use, which gives a measure of the dramatic changes that occurred in this period. It is undoubtedly a limited time frame, considering the remote historical origins of the Italian

landscape. However, as environmental historians have shown, this is the period when the abundance and intensity of changes at the global level occurred with a speed that had no precedent in the history of human civilization, and Italy is no exception.[7] At least until the second postwar period, much of the country's rural landscape was still strongly influenced by traditional agro-silvo-pastoral models developed during the previous century, and sometimes going all the way back to the Etruscan period and Greek civilization. The following decades, however, witnessed deep transformations. Due to demographic growth and the expansion of agriculture into mountain areas, the rural landscape attained the peak of its development in the decades between the late nineteenth and early twentieth century. The resulting landscape was one of great complexity, enhanced by the stratification of the prints left by so many civilizations on the land, and the country's complex orography and climatic variability. In the second postwar period, however, we observe a gradual simplification and homogenization of the rural landscape that can be analyzed in terms of its effects on its two main components: woods and crops.[8]

1.3.1 The Evolution of Agricultural Surfaces

The image of rural Italy at the time of the country's unification is one of great complexity. Adaptation to different and difficult local conditions, as well as differences in economic and social structures, had diversified the national territory over the centuries. Except in a few limited areas in the country, the history of Italian agriculture had been one of continuous and laborious adaptation to a difficult natural environment, mostly made of mountains and high hills, originally covered with impenetrable forests and extensive marshes, to create favorable conditions for agriculture. The result was an extraordinary landscape whose value has been recognized by Western culture at least since the sixteenth century. At the end of that century, Michel De Montaigne, going through the Garfagnana in Tuscany, observed in amazement that the land was cultivated and terraced from the foot of the mountains to their summit, appearing to him as a garden[9]. Those who followed in his wake echoed his admiration, from Grand Tour travelers of the eighteenth and nineteenth centuries—who were impressed not only by Italy's monuments but also by its rural and forest landscape—down to present-day tourists.

Morphological differences, farming systems, settlement patterns and local styles of rural buildings placed their distinctive stamp on the landscape of rural areas. The main agricultural systems, such as those revolving around local types of farmhouse—the Lombard *cascine*, sharecroppers' farms and farmhouses, the farmhouses of the

[7] McNeill J.R. (2000): Something New Under the Sun, W.W. Norton, New York.

[8] Agnoletti M. (2010): Paesaggio rurale. Strumenti per la pianificazione, Edagricole-Gruppo 24 Ore, Milano.

[9] Trechmann E.J., 1929, The diary of Montaigne's journey to Italy in 1580 e 1581, Harcourt, Brace and Co.

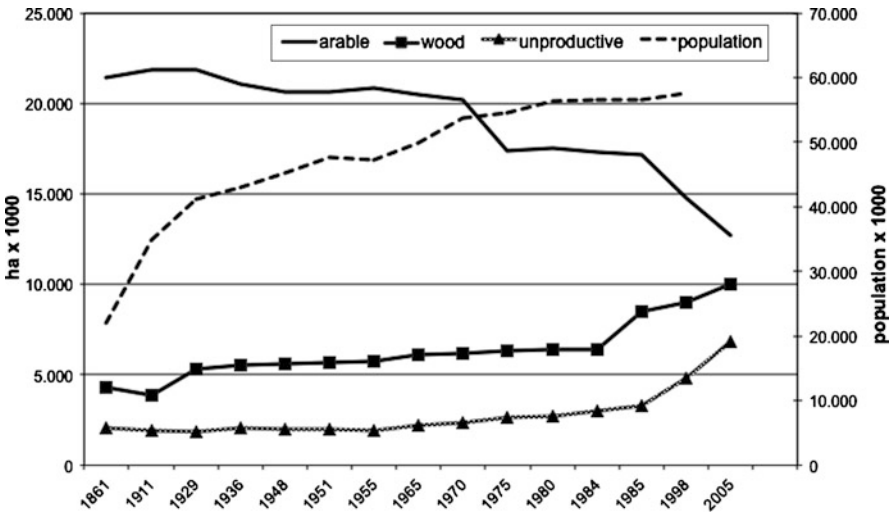

Fig. 1.4 Evolution of agricultural, wooded, and unproductive surfaces and of the Italian population from 1861 to 2007. One can observe the strong reduction of agricultural surfaces, about 10 millions ha, and the increase of woodland about 6.5 millions ha. Since 1920, the speed of farmed land loss is about 100,000 ha/year; the increase of woodland is about 75,000 ha/year; urbanization (2000–2010) is about 8,000 ha/year. (Agnoletti M. 2010, cit.)

grain-growing latifundia of Maremma, the Roman *casali*, or the *masserie* of southern Italy—are the most visible manifestation of a much more complex reality. In spite of Italy's great variability, however, there were some common traits, such as the extension of arable land with a prevalence of cereal cultivation. Italy's vast "bread lands" (*terre da pane*) reflected a strong orientation of agricultural production towards self-consumption and maintained their prevalence in the agricultural landscape until the 1960s, even in mountain areas. Another unequivocal sign of the importance of production for self-consumption was multiplicity of crops and mixed cultivation, as well as the presence of extensive terracing providing horizontal surfaces to allow crops to be sown in acclivitous areas, an enlightening example of ingenious adaptation to difficult environmental conditions to solve the food problem. In this context, agriculture in the post-unity period appears as the country's main economic motor, and displays strong continuity going back several centuries (Fig. 1.4).

From the twentieth century onward, the percentage of the population employed in agriculture, which used to comprise almost the total working force, slowly began to decline under the impulse of great socioeconomic changes. Today, the sector employs only 4 % of the working population and its share of the GNP is equal to ca. 3 %. These changes, however, occurred with different speeds and intensities in different parts of the country. The trend established itself much earlier in the industrial regions of the Northwest, where between the two wars workers employed in agriculture were already down to 35 % of the total working population. In the rest of Italy, the tipping of the scales between the primary and the secondary sector only

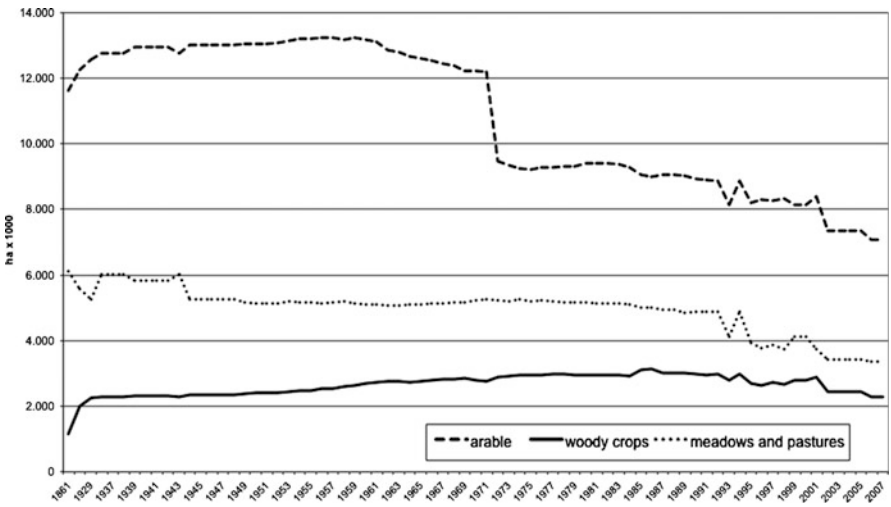

Fig. 1.5 Variation of the surface of fields, woody crops, meadows and pastures, 1911–2007. (Agnoletti 2010, cit.)

occurred on the morrow of the Second World War. Accordingly, landscape transformations of different areas of the country followed different timelines. As shown by the graph on the evolution of agricultural and forest surfaces, the importance of cropland makes it a dominant element in the Italian landscape, down to the present day. Nevertheless, today it has lost millions of hectares to the expansion of woods and unproductive surfaces, a category which also includes urban areas. In their turn, agricultural surfaces have undergone internal transformations that have changed the landscape fabric. From the second postwar period onward, available data show a sudden decrease of agricultural surfaces, the symptom of a transformation reflecting the dominant role of socioeconomic factors in the Italian landscape. The increase of unproductive and urbanized surfaces, on the one hand, and the increase of forests, on the other, are just different facets of the same problem, namely, the abandonment of agriculture. They are the result of an epochal transformation of our landscape that took place in just 100 years, and which has gone largely unnoticed. From 1920 to 2010 the rate of abandonment of farmed land is about 120,000 per year, the increase in forest land is about 70,000 per year, including burned forest areas, while in the last 10 years urbanization is advancing at a speed of 16,000 ha every year (ISTAT) although Corine shows a different figure. Therefore, the changes affecting cultivated land are by far the most important ones in terms of land use change. It is also worth reflecting that the scenarios of increasing temperatures due to global warming, are not going to generate the same land use changes occurred for direct socioeconomic reasons in the last 100 years (Fig. 1.5).

Within agricultural surfaces, the most significant reduction was of arable land, followed by that of meadows and pastures. The decline of grain-growing has special significance and symbolic relevance in a country that fought a “battle for grain” in

the 1920s. The decrease of grain field surface was only partially compensated by increases in productivity, so that today Italy imports most of its grain. Various factors intervened in bringing about this deep mutation of the rural landscape. Among these, especially worthy of mention are demographic evolution, the spread of important technological innovations such as chemical fertilizers and pesticides, and mechanization, which ended up favoring rather than limiting the exodus from the countryside. The employment of mechanical farming equipment, which considerably reduced labor requirements, along with the country's industrialization contributed to the abandonment of many cultivated surfaces, beginning with marginal mountain and high-hill areas. This evolution went hand in hand with a change in the structure of farming businesses, whose number declined sharply, although the average surface per farm has not changed much, a distinctively Italian trait that contrasts with the trend in countries like Spain or France. The low-to-middle size typical of sharecroppers' holdings and family-run farms has given way to a growing gap between large and small farms. An increasing trend to use externally hired rather than resident labor is breaking the bond between farmers and their holdings. From the 1970s onward, changes made to the Common Agricultural Policy (CAP) to limit surpluses favored the spread of non-food crops such as soy, colza and sunflower; vast industrial monocultures that have accentuated the simplification of the agricultural mosaic and are now facing a crisis.

In the second half of the twentieth century, along with the reduction of cultivated surfaces, there were radical changes in crops, livestock, and the activities of the agricultural sector. One of the most significant phenomena was the internal transformation of agricultural surfaces, with a trend towards specialized cultivations. This transition regarded all the typical sectors of agricultural and food productions. New cultivation techniques were introduced to increase productivity and product quality; a quality, however, in which the landscape and its specific environmental contents played no role. Wine, olive, vegetable and citrus-growing, as well as livestock and dairy farming, have all been impacted by these new trends, which have led to an intensification of production that is often incompatible with landscape quality. Slope-wise planting has replaced terraces. Tree rows, mixed cultivations and widely-spaced cultivations have made way to intensive specialized cultivations with reduced labor costs. Mixed cultivations, allowing up to four crops on the same plot of land, are actually one of the best examples of adaptation to reduced availability of cultivated land, producing more than a monoculture. Today they are often presented as new techniques for sustainable agriculture, but in Italy they existed since Etruscan times, about 750 B.C. (Fig. 1.6).

In the years of postwar reconstruction, Italian agriculture adopted a development model aimed at maximizing production to meet the internal food demand and compete on foreign markets. At first, the policies of the European union had the same objective. However, today this "battle for production" has been lost. The sector has proved unable either to meet the national food demand or to compete on international markets in terms of quantity. Over the last decades, the fate of both the grain and livestock businesses has depended on the changing moods of CAP funding rather than on the free market. The livestock industry, in particular, has become almost entirely independent of meadow and pasture resources, once abundant in the Italian landscape

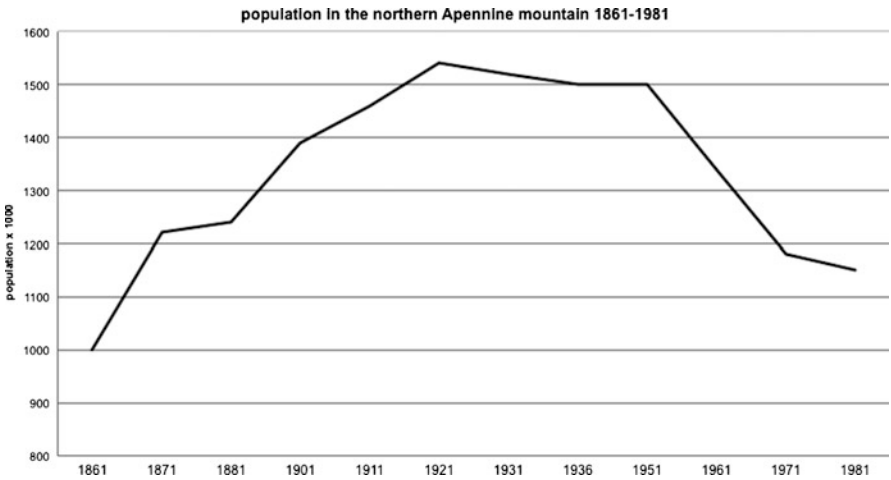

Fig. 1.6 The demography of the northern Apennines areas between 1861 and 1981, shows a first period with a strong population growth, characterized by the extension of fields and pastures on the mountains. After 1950 we observe a fast decrease of the population, occurring during the industrialization of the country, while abandonment is dominating the countryside

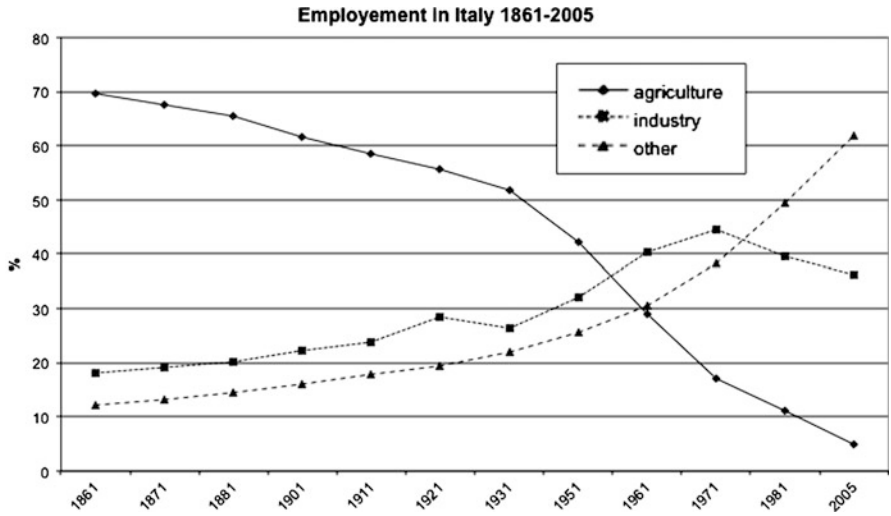

Fig. 1.7 The reduction of the importance of agriculture is reflected by the continuous decrease in the number of workers leaving the countryside to get better jobs in the industrial areas of the country

and much reduced today. In the context of this "imperfect" market, influenced by the orientations of the CAP and external global phenomena, the need and opportunity have arisen to associate product quality with landscape quality, to take advantage of an added value that the competition cannot reproduce, and, at the same time, implement low-intensity agricultural models more compatible with environmental quality and revive extensive livestock farming methods (Fig. 1.7).

Table 1.1 Statistics on land cover changes in Italy from 1990 to 2000 as recorded by the Corine satellite system, promoted by the European Environmental Agency

Land cover, CLC Level 2	2000 (km^2)	1990 (km^2)	2000–1990 (km^2)	(2000–1990)/1990 (%)
Residential urban areas	10,819.60	10,315.70	503.9	4.88
Industrial and commercial areas, and infrastructure	2,631.90	2,377.90	254	10.68
Mineral extraction, construction and dump sites; artificial and abandoned areas	565.1	514.7	50.4	9.79
Artificial non-agricultural vegetated areas	299.6	281.1	18.4	6.56
Arable land	83,121.90	83,760.60	− 638.7	− 0.76
Permanent crops	21,780.00	21,871.20	− 91.2	− 0.42
Permanent pastures	4,475.30	4,552.20	− 76.9	− 1.69
Heterogeneous agricultural areas	47,075.60	47,702.90	− 627.3	− 1.31
Forests	79,025.60	78,190.40	835.2	1.07
Areas with shrub and/or herbaceous vegetation	36,685.90	36,969.50	− 283.6	− 0.77
Open spaces with little or no vegetation	11,112.30	11,065.00	47.2	0.43
Inland wetlands	159	158.50	0.6	0.36
Coastal wetlands	531.80	532.30	− 0.4	− 0.08
Inland waters	2,186.20	2,175.10	11.1	0.51
Marine areas	945.50	947.90	− 2.4	− 0.26

As I mentioned above, urban expansion partially accounts for the increase of unproductive surface in our country. Urban growth is often branded as the main enemy of the rural landscape, something on which there is usually a broad agreement among the general public, farmers and environmentalists. While it is true that the permanence of agriculture acts as a barrier against urban expansion, it is equally true that the most significant changes in the rural sector are due to abandonment, on the one hand, and endogenous changes that are not as obvious, but much more in-depth and enduring, on the other. Urban surface, according to the most up-to-date European mapping system (Corine Land Cover 2000), does not exceed 5 % of the total surface of Italy. It is true, however, that scattered urbanization eludes Corine. The Italian Ministry of Agriculture, Food and Forest Policies hence resolved to establish a new category of rural area labeled *poli urbani*, including areas still classified as rural, but with high settlement densities. Table 1.1 details surface extensions for the five first-level CLC classes in 2000 and 1990. As one can see, agricultural areas are the prevalent category in terms of total surface, but also the category that changed most significantly, with a 1,434 km^2 decline. In relative terms, instead, the class that evolved the most from 1990 to 2000 is that of artificial surfaces, with a 6 % increase. Extending the analysis to the second level of Corine, the land-use class that expanded the most in absolute terms is that of wooded areas (by over 800 km^2). Interestingly, over 900 km^2 of shrublands and herbaceous areas evolved into woods. Within the class of artificial

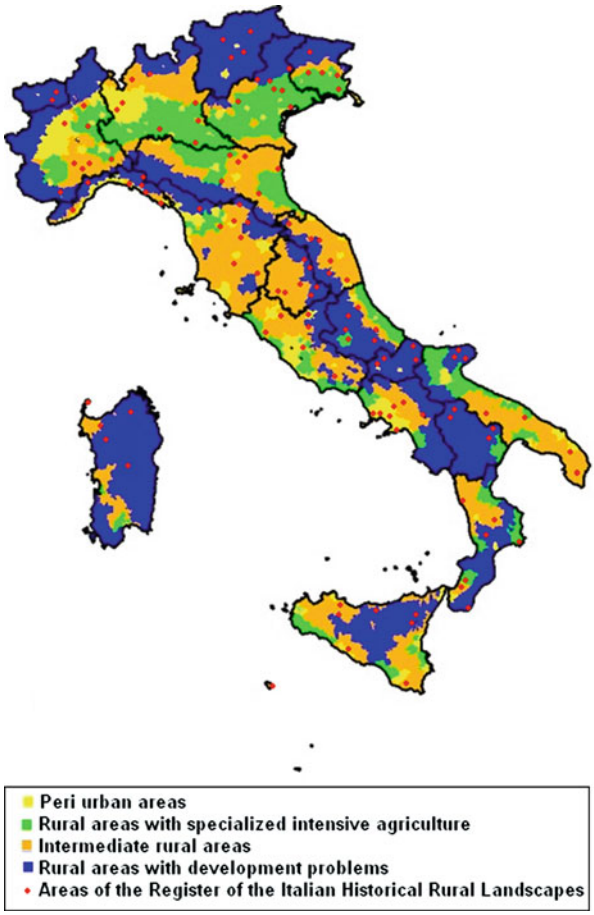

Fig. 1.8 map showing the different levels of rural development in Italy with the location of the historical landscapes surveyed. The forested areas, mostly placed on the mountains, correspond to the less developed parts of the country. Extension: periurban 8.8 %; specialized agriculture 20.3 %; intermediate 29.1; areas with development problems 41.8 %. The number of farmers in the areas with development problems and in periurban areas is the same, in spite of the very different extensions of these areas

areas, although urban areas for residential purposes have expanded the most in absolute terms (over 500 km^2), in percentage terms the largest expansion was that of industrial, commercial and infrastructure areas (10.68 %). This bears witness to the strong impulse to urbanization over the last years, whose visual impact on the general public is higher than that of changes in agriculture, since these can only be perceived by a trained eye, capable of interpreting changes in the rural landscape mosaic. In other words, while the great majority of the public can perceive the higher aesthetic quality of a Tuscan farmhouse compared to a suburban condominium, not all can appreciate the difference between a mixed cultivation and an industrial monoculture. This is why the solution of Italy's "rural landscape question" depends on the degree of cultural maturity of its society and on its understanding of landscape evolution (Fig. 1.8).

1.3.2 The Evolution of Wooded Surfaces

The Italian forest landscape can be historically interpreted as the result of changes brought about by human beings to the natural vegetation, following a well-defined historical sequence of culturally determined landscapes. The beauty of Italian forest landscapes was celebrated by Grand Tour travelers as much as that of the country's rural landscapes. Stendhal and Shelley were impressed by the splendid, dense chestnut groves extending down the slopes of the mountains around the Como lake almost to its banks. Edward Lear describes with admiration groups of huge oaks, as well as the incredibly diverse landscapes he encountered during a journey to Calabria in 1847, which he contrasts with the "forests dense as carpets" and "monotonous expanses of greenery" found in other countries[10]. Like its agricultural landscape, the wooded landscape of Italy today appears simpler and more homogeneous than in the past. Its diversity is presently mainly a matter of specific composition rather than spatial arrangement. This is partially a result of the presently clear-cut separation between the woods and agriculture, after many centuries of integration. The natural substrate of the Italian forest landscape was modified long before the Roman period, but the general public is largely unaware of our forests' historically determined character. This is partly due to the scientific trends of recent years, which have seen a prevalence of environmental approaches in the study and management of forests, constantly looking for "natural areas" to be protected; a quest that fails to take adequate account, however, of centuries of human influence. The truth is that the actions of human beings in historical and protohistorical times constantly modified the ecosystem. Identifying truly "natural" landscapes in Italy is thus not an easy task.[11] The last few decades have witnessed a trend in forest studies to relegate the historical reality of wooded landscapes in the background in favor of a naturalistic interpretation. This of course has affected management policies and led to conflicts with farmers and livestock breeders. Significantly, this research highlights many cases of woods that are losing their historical characteristics due not only to abandonment of traditional practices, but also to management policies aimed at transforming them into more natural formations.

The statistics in Table 1.1 show that in the period between the unification of Italy and the years immediately preceding World War I there was a significant reduction of Italian forests, mainly due to the expansion of agricultural land and pastures as a consequence of increasing demographic pressure in mountain areas. One of the interesting elements highlighted by the graph in Fig. 1.1 is the relationship between forest surface and demographic trends. As we can see, from the unification of the country to ca. 1910, demographic growth went hand in hand with a shrinking of the wooded surface. This is a typical landscape trend in developing countries, where the woods give way to pastures and fields to meet the urgent food demands of a growing

[10] Lear E. 1964. Edward Lear in Southern Italy: Journals of a landscape painter in southern Calabria and the kingdom of Naples, London, William Kimber, 1964.

[11] Moreno D. (1988): *Il paesaggio rurale fra storia e attualità,* Monti e Boschi, n 1, 3–4.

population. In spite of some not negligible problems in the data-recording criteria, it seems certain that from the 1920s onward there was a stable reversal in this trend, with a more than twofold increase of forest surface, although accurate statistics are not available.[12] Thus, in this period the ratio between population and woods extension changed, since the latter continued to expand independently of demographic growth; an indication that Italian society's food supply no longer depended on the availability of cultivable land. The 1920s thus marked the end of the last phase of surface reduction in the history of Italian woods, which had seen several expansion and reduction cycles from the Roman period onwards. The new expansion was the result of the gradual abandonment of mountain and high hill areas, a trend that is already apparent during the two world wars (1918–1939) and became unstoppable in the second postwar period. The secondary, post-cultural forestation process affected all of the country's regions, especially those where the abandonment of agriculture and animal husbandry was more intense, even extending to lower altitudes. This led to a gradual reduction of the pre-existing landscape mosaic, a strong and often uncontrolled increase of wild fauna, and a strong decrease of cultivated land. Today, Italian agricultural products are grown on much smaller surfaces, thanks to yield increases. Above all, however, the country imports them massively from abroad, a model it shares with Europe, North America and other industrialized countries, including some in Asia. All these countries have been experiencing for years a gradual growth of forest surface, a concomitant shrinking of agricultural surface, and growing recourse to external resources.

Along with the reduction of agricultural surface, to which it is indissolubly tied, reforestation is one of the most important phenomena to affect the Italian rural landscape in the last century. The expansion of the woods from 10 % of the national territory in 1920 to the present 34 % has changed the face of whole regions. This statistic, however, also partially reflects changes in the notion of "woods". The new forest inventory of 2007 regards as "forest formations" populations of trees or shrubs meeting all three of the following requirements: a surface larger than 5,000 m^2; a foliage cover percentage higher than 10 %; and an area width higher than 20 m.[13] The inventory includes the following categories: woods and other wooded areas; prairies, pastures and uncultivated land; sparsely vegetated areas; lumber farms, isolated groves and linear formations (tree rows). The land classified as "woods" accounts for 83.7 % of the total forest surface, "other wooded areas" for 16.3 %. According to this new classification, the forest surface of Italy is about 10,528,000 ha. Clearly, however, the above criteria also gather under the heading "woods" shrub and areas that are actually pastures or wooded pastures with trees or shrubs. These would require distinctive management approaches to adequately preserve their role in the landscape.

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[12] Different criteria for the classification of wooded surfaces can lead to very different results. The National Forest Inventory of 1985 (IFN) estimated Italy's wooded surface at 8,302,000 ha. In the same years, the ISTAT estimated it at 6,822,000 ha, and the FAO at more than 10,000,000 ha. Cf. Agnoletti M. (2005): Osservazioni sulle dinamiche dei boschi e del paesaggio forestale italiano fra il 1862 e la fine del secolo XX, Società e Storia, n. 108, 377–396.

[13] Ministry of Agricultural, Food and Forest Policies, Inventory of Forests and Carbon Reserves, http://www.sian.it/inventarioforestale/jsp/home.jsp.

Among landscape changes induced by forestation, the almost threefold increase of woods in Sicily and Emilia Romagna is especially remarkable. The Italian territorial districts with the higher percentage of land surface classified as "woods" are: Alto Adige, Trentino, Friuli Venezia Giulia, Liguria, Tuscany, Umbria, Abruzzo, Calabria and Sardinia. The most densely wooded regions are Liguria and Trentino, with a respective cover percentage of 62.6 and 60.5 %, while the less wooded regions are Puglia (7.5 %) and Sicily (10 %). "Other wooded areas" are constituted by 58.0 % of shrubland, with a large component of Mediterranean maquis and shrubland. If we consider the sum of all the surfaces classified as "woods" in the inventory, however, the most wooded region in Italy is Sardinia, because here "other wooded areas", that is sparsely treed areas and areas with shrub vegetation, mainly used for grazing, are the most extensive in Italy. The "woodland" of this region thus abounds with features classified as "low woods", "low density woods", "shrubs", making it very distinctive among Italian landscapes. This is a very interesting example of the unsuitability of the traditional concept of "woods" to a situation where wooded or treed pastures, maquis and pollarded groves—a vegetation perfectly adapted to the needs of the local economy—dominate the landscape, rather than woods intended as continuous and clearly bounded cover. Typically, this kind of vegetation is seen as a deterioration of "natural" vegetation, intended as tall woods, and is hence frequently steered to evolve in that direction.

Forestation is advancing in Italy at a rate of ca. 70,000 ha per year, including the loss due to fires, which is also indicative of the rate at which agricultural surfaces are being abandoned. The advance of woods contributes to reducing the landscape biodiversity of complex rural landscape mosaics, at such a rate that in Tuscany about 45 % of biodiversity has been lost since the nineteenth century, especially in the mountain areas[14]. This biodiversity, as indicated by studies of the Tuscan landscape monitoring system on some mountain areas in the region, arose from a great variety of land uses that have given way to a homogenization and banalization of the landscape[15]. It is true, although not always, that the expansion of woods can increase biodiversity as a result of the increase of the number of tree species. Concomitantly, however, there is a decrease in herbaceous species associated with meadows and pastures, and in animal species populating cultivated habitats, as well as a reduction of diversity at the landscape scale. Almo Farina provides a significant testimony of this trend. His research indicates that the replacing of olive groves with woods has determined a reduction of avifaunal diversity[16]. From a landscape perspective, it would be much more desirable to have less woods, but better managed, with a higher

[14] Agnoletti, M., 2007, The degradation of traditional landscape in a mountain area of Tuscany during the 19th and 20th centuries: implications for biodiversity and sustainable management. Forest Ecology and Management 249 (1/2).

[15] Agnoletti M. (2002): Il paesaggio agro-forestale toscano, strumenti per l'analisi la gestione e la conservazione, ARSIA, Firenze.

[16] Cf. Farina A. (1993): *Bird fauna in the changing agricultural landscape.* In landscape ecology and agroecosystem (eds.) Bunce R.G.H., Ryszkowski L., Paoletti M.G., Lewis Publishers, 159–167. Cevasco R. (2007): Memoria verde, nuovi spazi per la geografia, DIABASIS, Reggio Emilia.

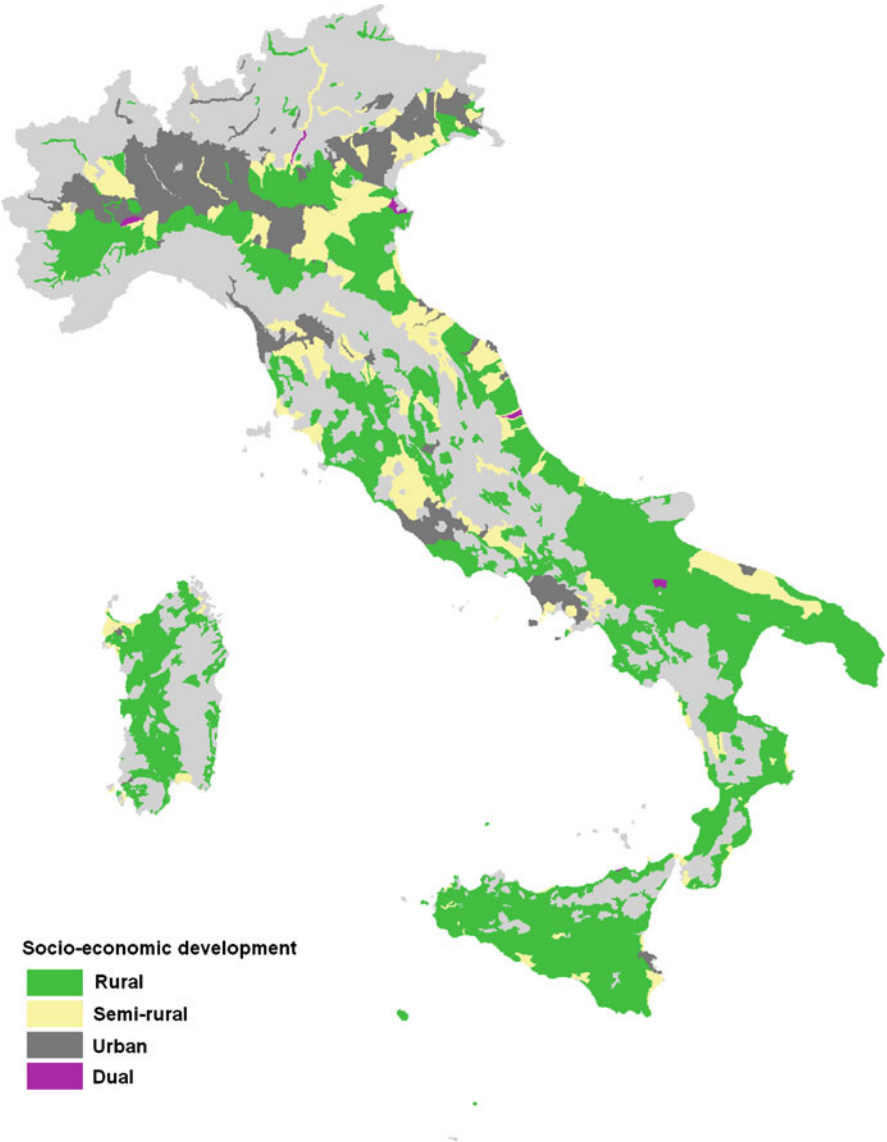

Fig. 1.9 In prevalently agricultural areas (see map on Fig. 1.2), the development model is no longer entirely rural. There are now vast zones with diffuse urbanization and semi-rural settlement patterns becoming more and more important. All this emphasizes the many functions of the rural landscape and the value assigned to it today, adding to the difficulty of adequate planning, but making it all the more necessary

level of spatial diversity, but we can say that the most endangered biodiversity is exactly the biocultural diversity addressed by the joint program between UNESCO and CBD, which is the right way of assessing the biodiversity due to traditional landscapes (Figs. 1.9, 1.10, 1.11, and 1.12).

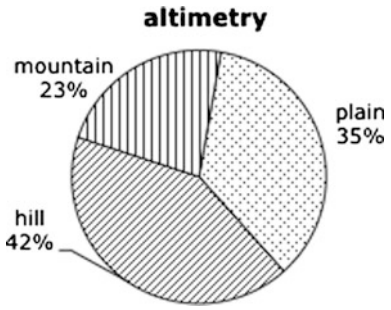

Fig. 1.10 The altitudes of the areas indicate prevalent locations on hills (41.6 %), reflecting the dominance of hills in the Italian landscape, followed by plains (23 %) and mountains (35 %). The reason is the scarcity of historical landscapes on the mountains, mostly affected by abandonment and reforestation, as well as on the plains, where industrialization of agriculture and urban sprawl, have degraded traditional landscapes

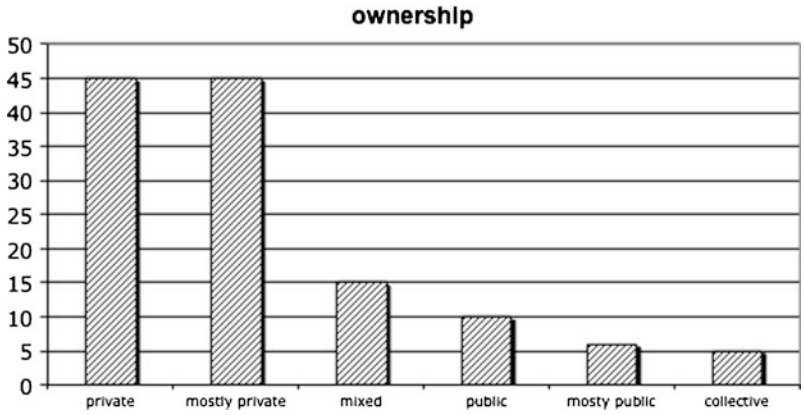

Fig. 1.11 The prevalent form of ownership in the catalogued areas is private property, but most areas show mixed situations that make planning more complex

1.4 Landscape Significance and Landscape Types

The criterion of "significance" employed in our selection of areas is not wholly patterned after the criteria in the UNESCO convention, which select sites proposed for inclusion on the basis of "exceptional universal values", indicating a broad range of elements to be taken into consideration. In the present reearch, instead, the emphasis is on the *national* value of landscapes, although the heritage value of some of the sampled areas undoubtedly transcends the national boundaries. By "significance" we mean here the set of "values" expressed by a given landscape, and, above all, the "historical persistence" of the local agricultural fabric. The deep changes the Italian

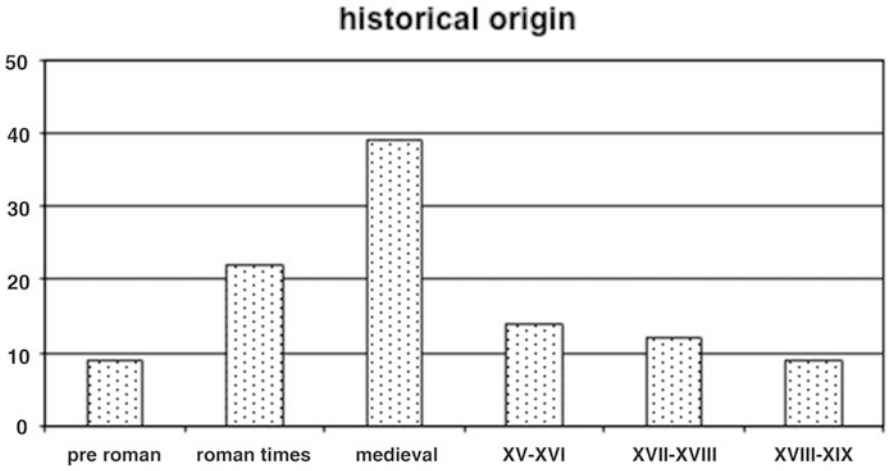

Fig. 1.12 The catalogued landscapes show remarkable historical persistence, and still feature crop management systems and cultivation practices going more than 2,000 years back, such as mixed wine-growing

rural sector went through have enhanced the special value of historical landscape forms that have shown strong resiliency. We left the case-by-case evaluation of significance to the specific competence and individual cultural sensibilities of our local investigators, who were prompted for further elaboration after the first draft of the area descriptions was completed.

One of the first questions the scientific committee had to deal with was the meaning to be assigned to the expression "historical landscape", a key concept for the definition of the criterion of "significance" employed to select the areas. Every landscape has a history. As Bevilacqua explains the use of the expression "historical landscape" could hence appear semantically inappropriate, or even misleading, without further specification. We hence looked at the work conducted on rural landscapes by some international institutions, most notably the UNESCO World Heritage Convention, the FAO and the IUFRO.

As regards the UNESCO World Heritage List, the catalogued landscapes certainly belong in the "cultural landscape" category, being the result of the combined work of human beings and nature, as defined in Article 1 of the convention regarding the category "continuing landscapes".[17] These are defined as still vital landscapes playing an active role in society, associated with traditional lifestyles and, although continuously evolving, retaining conspicuous testimonies of their historical evolution. This is a definition that well suits the historical evolution of Italian rural landscapes, and by contrast highlights a certain inadequacy in the formulation of Law 1497 of 1939, which protected "... beautiful views regarded as natural pictures", a definition that appears to leave out of consideration historical forms of

[17] For further information on this subject, see Fowler P.J. (2003): World Heritage Cultural Landscapes 1992–2002, UNESCO, Paris.

agriculture as a product of human work. It is worth noticing that at least a decade earlier the American geographer Carl Sauer wrote: "A cultural landscape is fashioned from a natural landscape by a culture group". Culture is the agent, the natural area is the medium. The cultural landscape the result".[18] This definition comes much closer to capturing the significance of the Italian landscape. In Italy, it took another half a century before Sereni gave a definition of the concept of landscape where the role of agriculture and history was finally made clear: "The form that man, in the course of, and for the ends of, his productive agricultural activities, consciously and systematically imposes on the natural landscape".[19]

I certainly do not mean to summarize in these two short quotations the whole debate on the concept of "rural landscape", but only to signal a certain inadequacy of the legislative and, in part, scientific landscape-managing instruments developed in Italy, which tend to overemphasize a naturalistic approach vs. a historical one, both in the domain of cultural heritage and in that of environmental conservation.

The traditional concept the UNESCO document refers to is taken up again in the FAO's project "Globally Important Ingenious Agricultural Heritage Systems" (GIAHS), whose aim is to promote traditional agricultural practices and the landscapes associated with them at the global level.[20] Actually, the notion of the association of traditional knowledge and landscapes was already contained in the "Agenda 21" document produced by the UN Environment and Development conference at Rio de Janeiro in 1992, and has hence been circulating for quite some time, notably in connection with the concept of sustainability, although little has been done about this issues. The FAO project specifies that traditional practices provided a fundamental contribution to the world natural and cultural heritage, as well as the biodiversity of rural areas. They reflect the evolution of humanity in its relationship with the natural world, and not only have produced landscapes of great beauty, but also a variety of services and products, and food security and a good standard of living. These are agro-silvo-pastoral landscapes, typically found in densely populated areas, are significant at the global scale and must hence be preserved. FAO's project, developed in the year 2000, was followed in 2003 by one of the Ministerial Conference for the Protection of Forests in Europe (MCPFE), which is slowly working at introducing these same values in the concept of "sustainable forest management". Although these values form the third pillar of Sustainable Forest Management at the European level, no policy-orienting resolution to promote them has been adopted by member countries so far, vs. many on ecological and economic values[21].

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[18] Sauer C. (1925): The Morphology of Landscape, University of California, Publications in Geography 2, 2.

[19] Sereni, 1961, cit.

[20] See the FAO website: http://www.fao.org/nr/giahs/en/.

[21] Agnoletti, M. et al., (2007): Guidelines for the implementation of social and cultural values in sustainable forest management, a scientific contribution to the implementation of MCPFE—Vienna resolution 3, IUFRO Occasional Paper N.19.

In view of the above considerations, we decided to regard as historical landscapes those characterized by the use of traditional practices, although methodological distinctions regarding the definition of "traditional" induced us to develop a parallel research project, financed by the Ministry of University, specifically devoted to traditional landscapes.[22] According to the guidelines of this project, landscapes are "traditional" when they have been established in a given territory for a long time, even many centuries, and appear to have stabilized, or to evolve very slowly. They are generally maintained with practices and techniques requiring few external energy inputs, whether in the form of mechanization and irrigation or of chemical fertilizers and agro-drugs. Their crop fabric is characterized by long historical persistence and a strong connection with the local social and economic systems that produced them. Their stability, or slow evolution, is evidence of harmonious integration of production, the environment and culture in a given area or region[23]. As a consequence, our selection criteria were not restricted to the permanence in a landscape of traditional practices determining its historical character. We employed the concepts of "significance" and "integrity" also included among the UNESCO criteria, but added that of "vulnerability" to emphasize the risk factors for each of the described areas (Fig. 1.13).

Our data are not the result of a systematic inventory, and hence have no statistic value. The purpose of this first sampling was only to single out some example of the most significant Italian landscapes. All the selected areas retain valuable vestiges of their historical origin (see Fig. 1.7). In many, crop continuity goes back at least 2,000 years, as in the case of the *alberata aversana* or the centuriated areas of the Po River Plain, although the crop fabric has often changed. The catalogued landscapes frequently show strong connections with the historical events that determined the evolution of local socioeconomic conditions and the main forms of holding management. Thus, sharecropping gave rise to polycultural mosaics, latifundia to extensive agriculture, and land reclaiming to regular farmland grids. The persistence of landscapes of Etruscan, Greek or Roman origin bears witness to the strength of the rural print left by these civilizations, which survived not only the barbaric invasions but also the recent and possibly more violent impact of the industrialization of agriculture. From a technical point of view, the influence of ancient agriculture appears independent of the land ownership system. Ancient techniques have survived through the ages down to our day, when sharecroppers and latifundists no longer exist, but the cultivation methods they employed are still in use. Most of the recorded landscapes date from the Middle Ages. This bears witness to the fecundity of the revival of Italian agriculture in this period and its role in shaping the landscape and identity of much of the national territory. On the other hand, our catalogue also includes more recent landscapes attesting to the slow development of traditional agricultural techniques, which have been forging landscapes well into the contemporary age, and in part still

[22] The project is coordinated by Prof. Giuseppe Barbera, a member of the catalogue's board of advisors. The definition is the one proposed by the coordinator in the text of the project.

[23] Cfr.: Antrop M. (1997): The concept of traditional landscapes as a base for landscape evaluation and planning. The example of Flanders Region Landscape and Urban Planning 38 (1997) 105–l17.

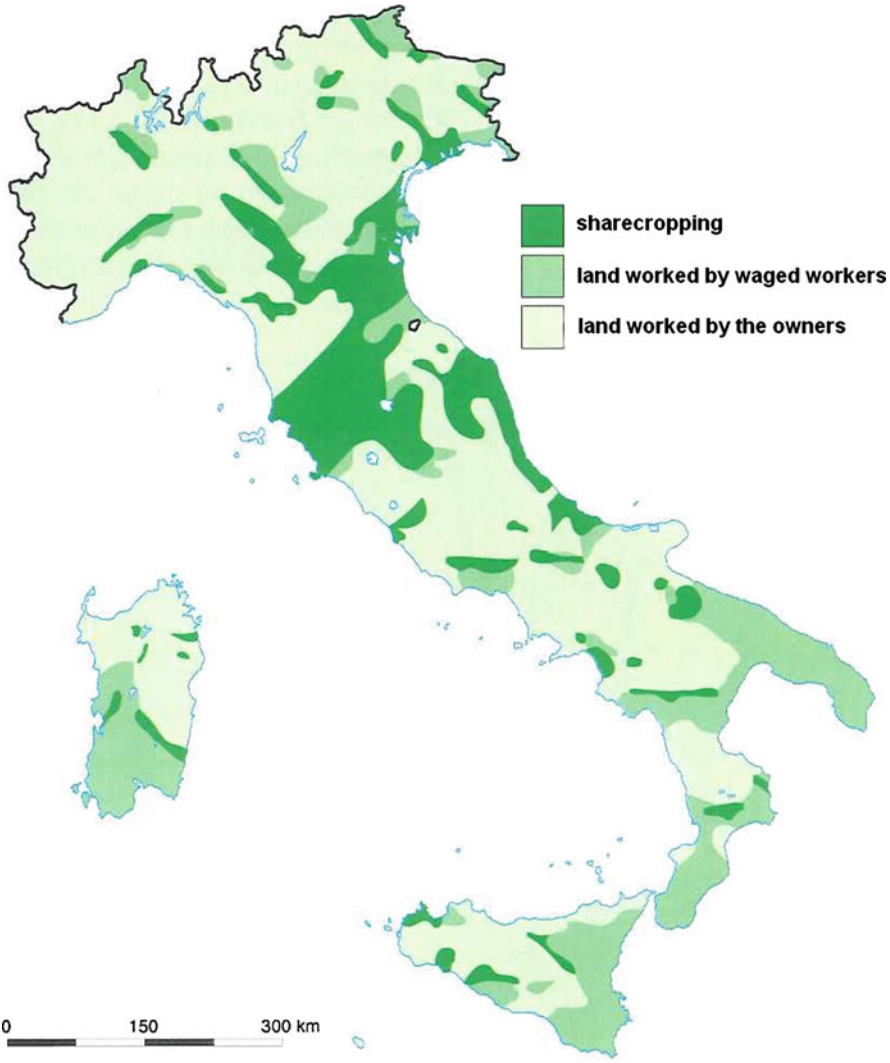

Fig. 1.13 Agrarian contracts played an important role in shaping the Italian rural landscapes**.** The share crop system was usually associated to fragmented fine-grained landscapes, on the contrary, latifundium usually relates to extensive cultivation and coarse grained landscapes. The map shows the situation in 1960 when the share crop system was still active. This also explains the survival of many landscapes from the middle age when the sharecrops system originated. (Grillotti di Giacomo M.G., 2000. Atlante Tematico dell'Agricoltura Italiana, Società Geografica Italiana, Roma.)

endure thanks to their remarkable adaptation to local environmental characteristics (Fig. 1.14).

Our study was carried in such a way as to allow us to analyze the different landscape categories found in the selected areas, organizing the data on different

Fig. 1.14 The *panteschi* gardens on the island of Pantelleria (for this study area, see the Sicily chapter), are an important instance of FAO's Globally Important Agriculture Heritage Systems (GIAHS), partly because they are an example of adaptation to a hot climate. Inside each of these circular dry-stone buildings a single citrus tree is planted, which grows without needing any irrigation thanks to the microclimate created inside the garden. If planted outside, the tree would soon succumb to the windy and dry climate of the island

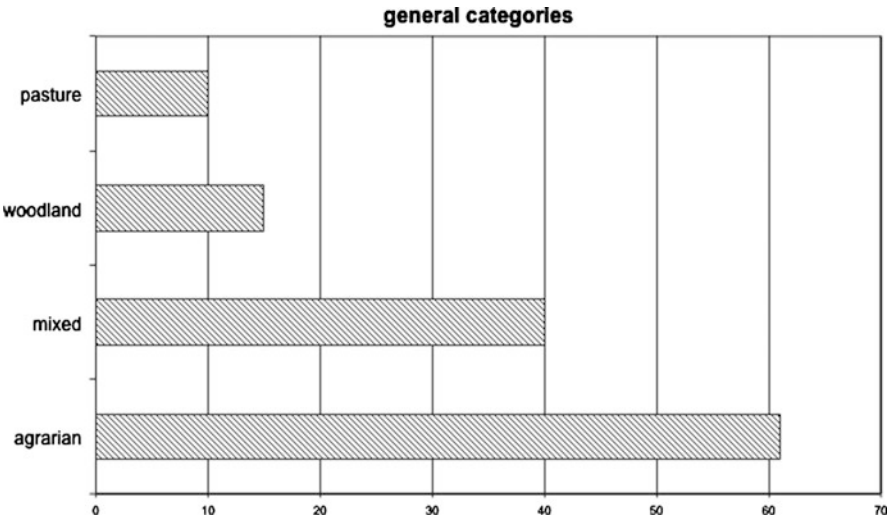

Fig. 1.15 Number of areas in each general category of rural landscape

hierarchical levels. As one can see (Fig. 1.15), among the catalogued areas there is a prevalence of agricultural landscapes, followed by mixed landscapes with polycultures, wooded landscapes, and pastures. This result partially depends on

the higher degree of complexity of the historical agricultural landscape. However, it also reflects the difficulty of finding woodland areas still retaining their historical characteristics, due to the dropping of wood management in the last century and the gradual loss of their integration with the agricultural and pastoral activities that once helped to diversify them. As to pastures, they are fewer in number due both to their significant decline and to their lower variety compared to agricultural and forest landscapes. The mixed landscapes characterized by polycultures recorded in the catalogue confirm that elaborate agricultural mosaics of small-scale cultivations still persist in many Italian regions, not just on small farms, but also on separately managed holdings belonging to large farms.

As regards categories of crops, in most of the selected areas vineyards are the main crop, followed by olive and grain. This is typical not just of the landscape of Italy, but of that of the Mediterranean as a whole. To quote Fernand Braudel, everywhere in the Mediterranean "can be found the same eternal trinity: wheat, olives, and vines, born of the climate and history; in other words, an identical agricultural civilization, identical ways of dominating the environment".[24] This statement eloquently summarizes the value of such landscapes, which in Italy assume special significance in the light of the importance of mixed cultivation, which places immediately after the first three in terms of frequency. This form of cultivation, typical of central Italy, is among those that most embody that beauty of the Italian rural landscape that made such an impression on many foreign scholars. Henri Desplanques, a French geographer, wrote that the agricultural landscapes of the hills of the Tuscan-Umbrian-Marchigian area were constructed as if with "no other concern than beauty" in mind (Fig. 1.16).[25]

1.4.1 Viticultural Landscapes

Wine-growing spread in our country from the East along two parallel routes, one from the north through the Alps, the other from the south by way of the Mediterranean Sea.[26] In the area of Greek colonization vines were cultivated as low trees, or on dry stakes, while in Etruscan territory vines were raised high up and eventually bound to trees, such as maple, poplar or elm. As Sereni explains,[27] the latter was by far the most widespread in Italy, probably even before the Etruscan period. Indeed, in the Po valley *labrusca* was the term designating wild grape whose long vines wove into the foliage of elms, maples and poplars. The training of vines on trees, mentioned by several Latin authors, was widespread from the regions crossed by the Po River to the Capuan countryside. It was later referred to as "Gallic-style" wine-growing, with reference to an origin in Cisalpine Gaul, where the Gauls had

[24] Braudel F. (1986): Civiltà e imperi del Mediterraneo nell'età di Filippo II. Einaudi editore, Torino.

[25] Desplanques H. (1977): *I paesaggi collinari tosco-umbro- marchigiani.* In: I paesaggi umani, Touring Club Italiano, Milano.

[26] Fregoni M. (1991): Origines de la vigne et de la viticulture, Musumeci, Quart.

[27] 1961, Cit.

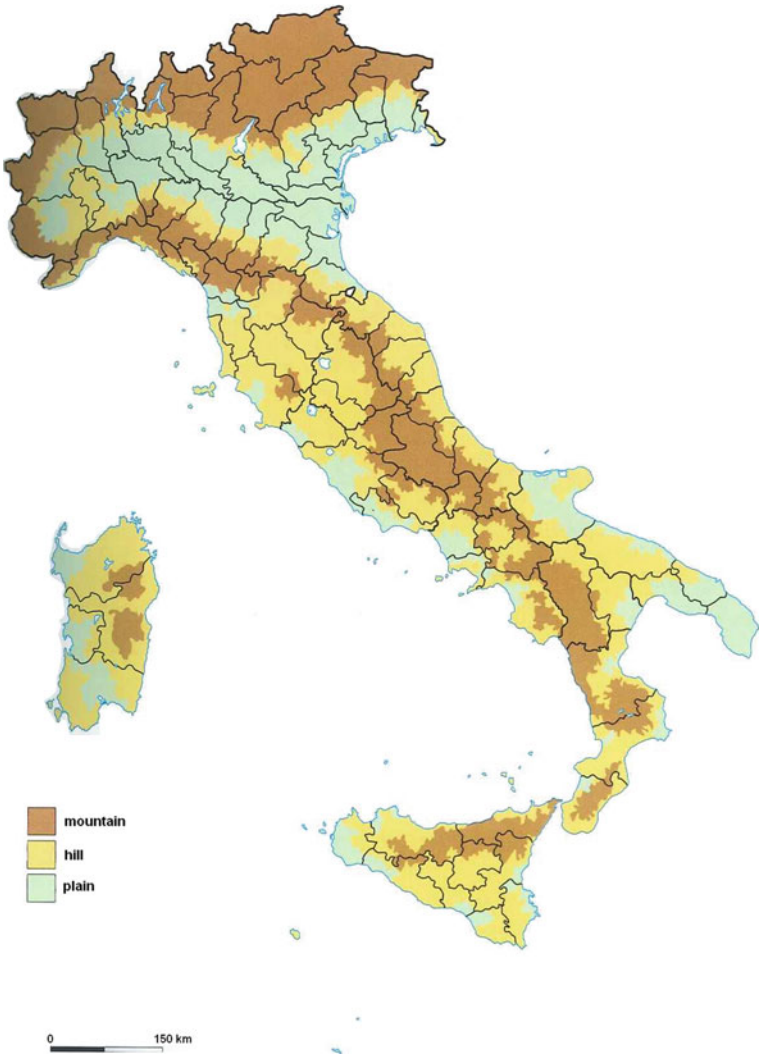

Fig. 1.16 Map showing the three elevation belts of Italy—mountains, hills, and plains—and the boundaries of the Italian Provinces. (Grillotti, cit.)

replaced the Etruscans. On the contrary, the shrub vine, low-stemmed or trained on a dry stake, was mainly grown in the south of Italy. Its original propagation area coincided with that of Greek colonial penetration, but it was found all over the Mediterranean, as well as in northern France, Germany and certain mountain zones, and, in general, in areas with hot and dry summers. This eventually became the prevalent system, although the use of dead supports, that is of wooden stakes, apparently first reached northwest Italy from the Greek colony of Marseilles. The two systems undoubtedly reflect different growing traditions, and their variants produced

equally different landscapes. However, they were also developed as an adaptation to different environmental conditions. In the northern Italian plains, the priority was to keep the vines raised above the humid soil and as exposed as possible to the rays and warmth of the sun. In arid areas and on the mountains, instead, they were kept low to allow them to absorb the heat of the dry soil. These two systems were the ancestors of a myriad of different cultivation systems. In fact, few plants have known such a high number of pruning and growing systems as vine, which, along with different land shaping systems, resulted in great landscape variety. In Italy, the number of vine-growing systems was still described as "boundless" in oenology treatises of the 1950s. Their description was simplified by classifying dividing them as either "long pruning" or "short pruning" systems, subdivided in their turn in low, middle and tall.[28] The shrub vine, being rather low and varying only in the number of shoots produced by each plant, called for a relatively lesser variety of growing methods. These include the two-branched Puglian system and the pollarding of vines in Calabria and Sicily. "Spurred cordons", also classified among short-pruned vines, employing poles and later wire have given rise to further systems.

As regards vines trained on trees, instead, a very vast range of methods exists. Pergolas, canopies, radial layouts, the Pozzuoli system, single or double-row layouts, and monocultures resulted in incomparable landscape diversity enhanced by the combining of wine-growing with other crops in mixed cultivation systems. Until the second postwar period, the training of vines on trees was still included among the normal wine-growing systems described in agriculture treatises, which distinguished between "high" systems—sometimes defined as "grandiose" by 1950s agronomists—and mid-height systems. Different methods of pruning live supports resulted in very elaborate and ingenious shapes, such as are still observable in Tuscany today, where the side branches of maples are caused to grow horizontally to hang the vines from them. In the Marche, instead, "festoons" of vines drawn from one maple to the next were often used, a system also found in the countryside of Verona. Every province of Emilia had its own system for training vines on trees (*alberata*), frequently employing elms, with two or four main branches (in the latter case known as *cavazzi*) in Romagna, later replaced by pergolas, also on elm trees, which in their turn could be simple or double. The *alberate* of Aversa, in the Campanian plain extending from Volturno towards Naples, were especially renowned. These were large structures employing poplars as tall as 20 m, on which the vines were trained in superimposed festoons as high as 10–12 m above the ground. This type of landscape is documented by one of the areas in Campania selected for the present catalogue. The system took advantage of the great fertility of the soil and was often combined with several other crops. The pruning methods employed for the live supports are so various that they would deserve separate treatment, as would the pergolas found all over Italy, for domestic use as well as agriculture, with an especially high number of variants in Trentino (Fig. 1.17).

Considering their important role, among other things, for biodiversity, it is worth dwelling on the vine-supporting trees themselves. The dissemination of these species

[28] Dalmasso G. (1954): Vitilcoltura pratica, Hoepli, Milano.

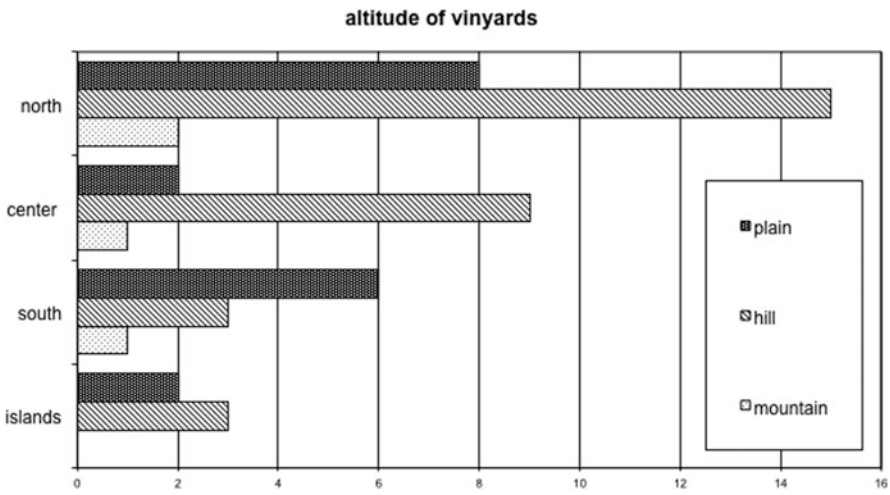

Fig. 1.17 Unlike the north and center, and the islands, in the south we find a prevalence of historical vineyards in the plain. This is hardly surprising, because the moving of viticulture from the plains to the hills is reported as a recent phenomenon in some areas of central Italy

in Italy partly reflects the natural composition of the country's woods, but even more their role in agriculture. Latin authors mention the use of species such as cornel, ash and hornbeam, as well as maple, elm and poplar. In the 1950s, agronomists still advised to choose trees that were not too bulky and would not compete with the vineyards for light, air and soil. Species with taproots were hence preferred, as these would seek nutrients deeper in the soil than the roots of the vines; also, species with not too dense foliage and that would tolerate the very radical pruning required by the various growing methods. One of the most widely used species ever since antiquity was undoubtedly the field maple (*Acer campestre*), a very rustic and hardy tree, employed especially on dry soils in Tuscany, Romagna and Marche. The elm (*Ulmus campestris*), instead, was more common in the *alberate,* tree rows of the plains of Emilia and Romagna, but was also employed in Umbria and Campania. It offered the advantage of yielding leaves that made savory forage for cattle, but required fresher soils. Unfortunately the Dutch elm disease decimated the Italian elm population. This, along with the disappearance of *alberate*, has made it especially rare in the countryside. Other species used for vine training include the ash (*Fraxinus excelsior*), in Latium, Umbria and less frequently in Veneto, especially on hills and poor soils. The willow (*Salix alba*) was used just about everywhere in fertile and cool plain areas. Mulberries (*Morus alba*) were commonly used for vine-training in the countryside of Treviso and Udine, although their dense foliage made them less than optimal. That is why in "radial" viticultural systems they were grown very high to keep their shade off the vines. Another popular live support was the black poplar, typical of the *alberate* of Campania, but also used in Tuscany.

A subject that has an interesting bearing on the relationship between wine-growing and the forest landscape is that of dead supports. Historically, the most widely

employed supports were wooden poles and reeds. These were replaced from the 1950s onward by concrete poles and then the iron rods used today. Whenever possible, the poles were produced on the farm itself, which is one many facets of the close bond between woodland and agriculture found in much of the Italian rural world. Poplar or willow poles were used in the Po River Plain, but chestnut poles were preferred wherever coppice woods of this species were available. The woods were cut in rotations from 4–5 to 9–12 years to produce poles, earth anchors, and innumerable other assortments. Farm account books provide detailed reports on the quantities and qualities of the chestnut assortments used in viticulture. In some Alpine regions, poles of forest pine were used. Larch was also used, especially in Trentino. It is an excellent wood, with a high resistance to harsh weather conditions, and very valuable. Equally excellent is oak wood, rarely used for poles, due to its usefulness for other purposes. In this broad range of species it is not surprising to find assortments obtained from heather shrubs. The problem of wooden poles is that they do not last as long as concrete or iron ones; however, they are certainly better adapted to the landscape and forest economy.

Over the last 30–40 years, Italian viticultural technology has evolved at a prodigious rate. This transformation has resulted in a qualitative improvement of the wine, the rise, or resurgence, of many wine-growing areas, and the success of Italian quality wines on the national and international market. The new technical advancements involved not only an improvement of wine-making processes, but also a reorganization of cellars, the developing of new machinery, and new growing methods. This evolution did not leave much room, however, for a valorization of landscapes and local cultural identities. In the case of vineyards, there appears to be a contradiction between the constant and almost obsessive use of terms such as "quality" and "local" to seize larger shares of the market and the fact that the main added value, the local landscape, is rarely invested in by wine-growing businesses. There has been a disproportionate increase in the extension of vineyards and great publicity for wine areas, wine routes, etc., which consists more often than not in invitations to visit industrial monocultures as can be found elsewhere in the world, apart from differences in land morphology or in local architectural features such as castles or historical farms. As stated in the 2001 "Regional Plan for the Renovation and Conversion of Vineyards" of the Tuscany regional government, the commercial value of local wine is largely determined by cultural and landscape values; that is, the image of the production area as perceived by the consumer. This image must hence not be degraded, at the cost of losing the only value that competitors cannot reproduce. Indeed, all the most important investigations on the subject indicate a growing awareness among consumers of the importance of landscape quality.[29] Fortunately, there are also some positive examples. These include the terraced viticulture of the Alps and Liguria, where some wine-growers partly renovated the local terraces with dry-stone walls, and introduced new forms of vineyard organization based on ancient practices, but combined with innovative methods. These wine-growers have also revived mixed wine-growing.

[29] Tempesta T. (a cura di) (1997): Paesaggio rurale e agro-tenologie innovative. Una ricerca nella pianura tra Tagliamento e Isonzo, FrancoAngeli, Milano.

These examples prove that there is no imperative to bow to the dominant model and grow wine in the globalized landscape generated by this model. While traditional practices were abandoned for economic reasons, cost-effectiveness may not be the most effective way to compete on the market. Shrewder entrepreneurs, not just those who love the landscape, understand that competitiveness today depends on the overall quality supplied to the consumer, and this quality can only be ensured by typical products and the landscapes in which they are produced.

1.4.2 Olive Landscapes

The olive tree has contributed to the Mediterranean landscape at least since the fourth millennium B.C.,[30] both in its wild form (*Olea europea* var. *sylvestris*, Oleaster) and in its domestic one (*Olea europea* var. *sativa*), which are widespread in natural and cultivated rural and agroforest systems.[31] Thanks to centuries of selection and relative genetic stability, this species has adapted even to the most extreme ecological conditions of the Mediterranean region. It is thus cultivated in 18 Italian regions, with the sole exceptions of Val d'Aosta and Piemonte. In each of these it has given rise to locally adapted and highly diversified cultivation systems—and, hence, landscapes. These olive-growing landscapes can be regarded as the most ancient in our country, because they have remained essentially unchanged both in biological (genetic) terms, and as regards their structure (tree spacing and growing systems) and distribution, more so than other systems within the same agricultural and landscape traditions. Nevertheless, for historical and ecological reasons, it is not easy to circumscribe an "Italian" olive-growing method. Actually, the first and principal feature of the country's olive-growing systems and landscape is its diversity. Both common traits and differences can be traced in the heterogeneity of local variants and the centuries-long adaptation of cultivation methods to local variables, which could include farm organization, edaphic or climatic conditions, or the economic and social structure. This diversity was further enhanced by massive land-shaping works undertaken by farmers to allow olive-growing on previously unsuitable terrain and almost push the crop beyond its ecological or agronomic limits. Farmers went to such great efforts because of the food and economic value of the main product of the olive tree, its oil, which over the centuries remained a major commodity traded to increasingly faraway countries, where it was in demand for several industrial uses rather than as food. In fact, the nutritional use of olive oil was once almost an exclusive privilege of the populations who produced it, whereas today it is universally appreciated as a healthy food rich in organoleptic properties.

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[30] Zohary D., Hopf M. (1993): Domestication of plants in the old world, Clarendon Press, Oxford.

[31] Much of this text is reproduced from an unpublished article: Giuseppe Barbera, Paolo Inglese, Tommaso La Mantia, La tutela e la valorizzazione del paesaggio colturale dei sistemi tradizionali dell'olivo in Italia. Dipartimento di Colture Arboree, Università degli Studi di Palermo, Viale delle Scienze 11, 90128– Palermo.

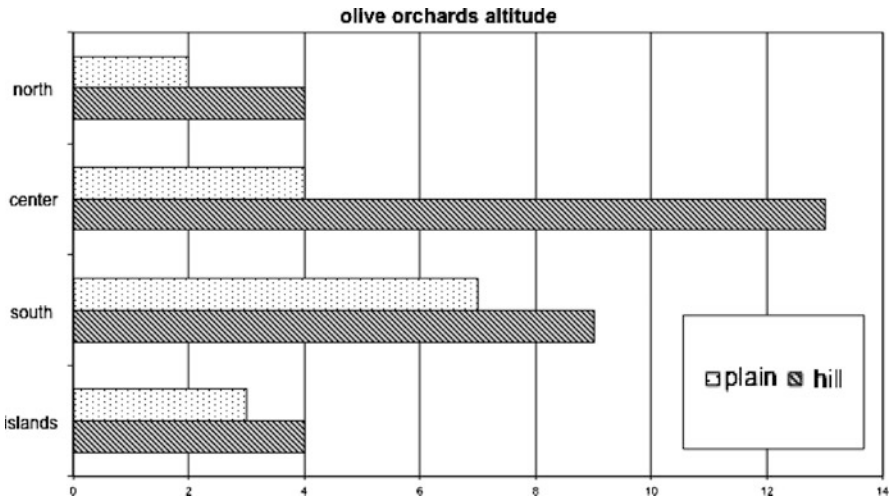

Fig. 1.18 Altitudes of olive groves in the catalogued areas. Most of the olive-growing areas are in central Italy, especially in the hills. A significant part of the historical olive groves, instead, are found in the plains of the southern regions

For about 50 years now, in Italy as in other Mediterranean countries, a process of polarization has been going on, whereby areas more suitable for industrial agriculture are being converted to intensive cultivation and productive simplification, and monocultures are spreading. Conversely, in marginal areas such as mountain or hill districts, cultivation is being abandoned, and this, depending on local environmental and social conditions, is leading to hydrogeological deterioration or renaturalization. In olive-growing, too, we are witnessing a trend to modernization (Bartolozzi 1998). New intensive models are being introduced, such as close-spaced groves, weak rootstocks, irrigation, and the integral mechanization of harvesting and pruning. This raises the issue of preserving the historical landscape, which these techniques tend to deteriorate.

In plain areas with suitable conditions, where 10 % of historical olive farms lie, some of the most important historical systems of Italian uliviculture are found, as examples in the present catalogue bear out. The efficiency of these systems is low compared to farms employing modern cultivation methods. This problem is often addressed by uprooting old olive groves and replacing them with intensive plantations compatible with integral mechanization, irrigation and industrial production. As an alternative, active action should be taken to preserve olive groves with great landscape value and their traditional cultivation systems, using the funds of rural development programs to make up for their lower productivity and higher costs (Fig. 1.18).

In hilly areas, where most of the Italian historical olive groves are found, today one observes a process of productive rationalization (closer spacing, new husbandry techniques involving coppicing, and no-till farming) that has given rise to a semi-intensive uliviculture retaining only part of the features of the original growing system

and of the traditional landscape. The most successful innovations include conservative action capable of prolonging a tree's life, and cost-cutting and yield-increasing innovations. To reduce costs, one of the principal measures is to limit the volume and height of the foliage to favor the mechanization of pruning and gathering. Another is the introduction of nets, which have become so widespread that today they are a typical feature of olive-growing landscapes, although hardly an aesthetically pleasing one, at least during the harvest period. As to yields, these can be increased by growing the trees closer together, introducing irrigation, and implementing new soil management, fertilizing and protection techniques. All this has led to changes in the olive-farming model and the features of olive-growing landscapes. In conditions of higher marginality, instead, on the steeper slopes or narrower terraces, olive trees are still an element of mixed cultivation systems and landscapes, wherever these have survived the rural exodus and the underremuneration of farmers; or else they are left to semi-natural conditions and end up forming true mixed woods, which end up meeting the requirements for the current definition of "woods".[32]

It is the mass urbanization of the last postwar period that, by leading to the abandonment of the countryside, determined the crisis of Italian traditional olive-growing, at least in its most significant historical and landscape manifestation, that is, hillside mixed cultivation. To face this crisis, a technical renovation was invoked and, in part, carried out, largely under the spur of a trend to the specialization of Italian agriculture. In the 1960s, many agronomists saw traditional mixed cultivation as "the enemy"; an unexceptionable argument, in the perspective of the transition of uliviculture "from tradition to economic reality", but which later came up against an evolution of the market that was unfavorable to industrialization, mainly due to international competition with countries with much lower labor costs. In those years there was no full and widespread awareness, even in the world of research, of the fact that traditional farming and agroforestry systems did not play a merely economic role, but also a systemic and multifunctional one, as products of collective planning measuring the need to produce against the availability of local resources and the characteristics of the environment. These systems not only provided valuable products both for self-consumption and for trade, but also landscapes that guaranteed environmental preservation, cultural enrichment, and spiritual well-being.

The mixed cultivation of the olive was widespread in central Italy, where most of the olive-growing areas in the catalogue lie, but polycultural systems centered around olive orchards are also found in other Italian regions, in combination with arable land or dry-farmed fruit-orchards. The Puglian system is exemplary in its chronological evolution: "Usually the olive is associated in the plantation with grapevine grown as a shrub, almond, or fig; rarely carob. Within the first 40 years from the planting of the olive grove, the grapevine gradually deteriorates and is uprooted; in the subsequent 20–30 years, the almond also concludes its productive cycle, so that around their seventieth to eightieth year the olive trees, which by this time have reached peak yield, are associated with herbaceous plants alternating with resting

[32] Vos W., Stortelder A. (1992): Vanishing Tuscan Landscapes. Pudoc, Wageningen.

and grazing periods".[33] This was the landscape of the specialized olive orchards of the Conca d'Oro around Palermo in the mid fifteenth century[34] and the "vast olive woods" that Leandro Alberti saw in Puglia a century later: "One sees many olive and almond trees planted in such an order, that one wonders how men could have planted so many trees". As early as the eighteenth century and in part even today, Puglian olive-growing areas appear as "a continuous forest of olive trees interrupted only here and there by small portions of open land and gardens". Olive-growing at Gioia Tauro in Calabria also allegedly developed in the eighteenth century. Here olive groves "arranged without any order" and in the persuasion "that they did not require any form of husbandry" were transformed in "regular and exquisite" plantations in the following century; a process reflecting a virtuous relationship between southern Italian arboriculture and the European industrial revolution, "one of the grandest processes of reorganization of the agrarian landscape to have affected the countryside of the South in the contemporary age",[35] which explains the inclusion of this area in the present catalogue. Calabrian olive orchards are "extensive monocultures". They probably resemble, on a much larger scale, the olive groves protected from grazing animals and thieves by walls or hedges once found in central Italy, as well as the *chesure* of medieval Puglia. The rustic characteristics of the species and its scarce need for cultivation is reflected in the Tuscan olive orchards of the early nineteenth century, and those of the Ligurian tradition. The Tuscan orchards, defined as "forest-style" or "Pisan-style", had densities up to 700 trees per hectare (much higher, that is, than in Calabria, where orchards had as little as 40–50 trees per hectare, although when they reached maturity they nevertheless ensured complete and uniform ground cover). The Ligurian olive orchards, especially in the province of Imperia, have the appearance of woods. They are also represented in our catalogue, as yet another testimony of the high variety of Italian traditional olive-growing landscapes.

In Italy, today, one can still find many of the olive-growing systems and landscapes found in the country in the course of its history. This great variability—from abandoned trees that have half reverted to the natural state on many terraces to mixed hill farming and monocultures in the plains—distinguishes the olive from other arboreal crops that, for biological or agronomic reasons, were unable to adapt to very different and changing ecological and social conditions. This diversity is evident both at the landscape level, insofar as it affects both land morphology and the landscape mosaic, and in farming systems, which are a result of adaptation to the environment, agronomic approaches, and the *habitus* of the trees. Further variability is determined by environmental conditions. When these are especially harsh—cold, extreme drought,

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[33] Morettini A. (1950): Olivicoltura, Ramo Editoriale degli Agricoltori, Roma.

[34] Barbera G. (2000): L'Orto di Pomona. *Sistemi tradizionali dell'arboricoltura da frutto in Sicilia.* L'Epos, Palermo.

[35] Inglese P., Calabrò T. (2002): Olivicoltura e paesaggio nella piana di Gioia Tauro, Laruffa Editore, Reggio Calabria; Bevilacqua P. (1996): Tra natura e storia. Ambiente, economie, risorse in Italia, Donzelli editore, Roma.

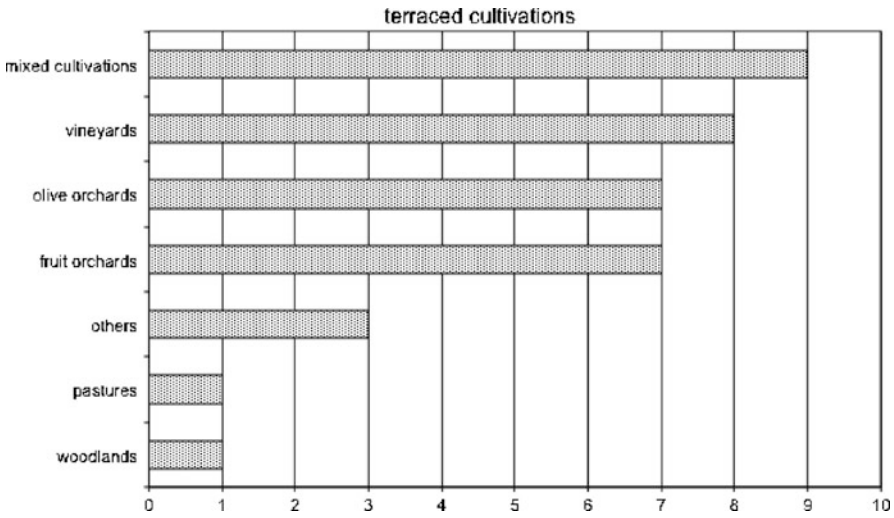

Fig. 1.19 Cultivations on terraced slopes

strong winds—the trees are much smaller, as in the case of those of the island of Pantelleria, which barely grow to a meter in height (Fig. 1.19).[36]

Traditional olive-growing is multifunctional. Olive trees were a fundamental source of firewood, fruit and foliage for forage, often in the face of a dramatic scarcity of resources or adverse economic and social conditions. They contributed to the healthiness of people's diets, yielded a marketable commodity, but also helped to safeguard the environment and landscape quality. Traditional growing methods reached their production objectives by sustainable processes that needed little or no resources external to the agrosystem and ensured the conservation and fertility of the soil. The bio-agronomic characteristics of the olive tree make it indeed well suited for cultivation in structurally and functionally complex systems: "It grows in an intimate relationship with a series of biotic and abiotic factors that constitute an agroecosystem".[37] The tree consequently contributes to ecological stability, both from a phytosanitary point of view, since few insect parasites can damage it beyond its tolerance threshold, and as regards soil protection, since it ensures sustainability even after onerous land transformations that deeply alter base ecological conditions, as proved by the centuries-long survival of imposing terraces on the slopes of so many Italian hills and mountains. The sustainability of traditional olive growing requires high levels of biodiversity, at the agrosystem level—achieved, for example, through polyculture, at the farm-management level, through integration with livestock raising, and at the landscape level. The resulting system employs endogenous resources and processes that make it independent of external energy inputs and capable of easy

[36] Baratta B., Barbera G. (1981): *La forma di allevamento nell'olivicoltura di Pantelleria,* Frutticoltura 12: 43–45.

[37] Barranco D., Ricardo F.E., Rallo L. (2001): *El coltivo del olivo.* Ediciones Mundi-Prensa, Madrid.

recovery after biotic or abiotic stresses. Traditional olive-growing systems frequently exist as patches in a highly fragmented mosaic of different types of agricultural and semi-natural systems resulting in high landscape diversity. At the farm level, biological diversity remains high both when the olive trees are part of a polycultural system and when they are grown in almost semi-natural condition with a minimum of husbandry.

As illustrated in Diego Moreno and Roberta Cevasco's essay, there is an obvious connection between historical landscapes and biodiversity. In mixed cultivation, specific biodiversity is high, partly because of the numerous animal species[38] attracted by the great availability of food sources—especially an abundance of insects, and highly energetic fruit during the winter—and supported by a complex and stable ecosystem, except where human action—e.g., phytosanitary measures—disturbs its balance. Olive-tree windbreakers, often seen in Italy and employing specifically selected varieties, contribute to biodiversity, as one of the few specific studies on this subject has shown.[39] The avifauna of olive orchards is especially rich, and includes some species that are on the decline in the Mediterranean today. Compared to that of other agrosystems, it is closer in quality and quantity to the avifauna found in natural habitats. The reduction of olive-grown surfaces and the evolution of olive orchards into mixed woods actually determined a reduction of avifaunal diversity in some cases studied by Almo Farina (1993). The relationship between olive trees and the avifauna is one of reciprocal advantage, since the olive is a "bird-dispersed" tree.[40] Besides the usual Turdidae (thrush, blackbird, etc.) and Sylviidae (blackcap, Sardinian warbler, etc.), Columbiform birds such as the wood-pigeon (*Columba palumbus*) also play a role as disseminators by eating even the larger seeds, especially in areas where the wild olive tree is replaced by large-pit domestic varieties. Besides their economic and environmental functions, traditional olive-growing landscapes also play an evident cultural role due to their strong aesthetical and ethic identity. They are the result—masterfully expressed in painting and literature, and which is part and parcel of the European imagination, where olive trees evoke southern landscapes and perennial spring—of a nature designed by human beings' work, and hence harmonious and friendly.

1.4.3 Cereal-growing Landscapes

Any examination of Italian cereal-growing landscapes, aside from acknowledging their importance in the country's farming landscape, must take into account a

[38] Loumou A. e Giourga C. (2003): *Olives groves: The life and identity of the Mediterranean"*. Agriculture and Human Values: 87–95.

[39] Lo Verde G., Perricone G., La Mantia T. (2002): *L'azione di differenti tipi di frangiventi sull'artropodofauna e sulle caratteristiche bioagronomiche di un aranceto nel territorio di Menfi* (Ag). Italia Forestale e Montana, 4: 390–408.

[40] Alcantara J.M. e Rey P.J. (2003): Conflicting selection pressures on seed size: evolutionary ecology of fruit size in a bird-dispersed tree, Olea europea. J. Evol. Biol. 16: 1168–1176.

remarkable technical evolution and a great diversity of environmental situations.[41] A variety of cereal cultivation systems are recorded in the history of the country, ranging from vast extensive monocultures to small plots on terraces or mixed cultivations. As regards the agronomic aspect, both grain and maize, until the agricultural revolution brought about by the spread of chemical fertilizing, were grown in a rotation system. In antiquity, except for some more fertile areas like Campania, the most common system was the two-field one, where the land was divided in two parts, one allowed to lie fallow where livestock grazed and another where cereals were grown. Cereals also often alternated with hay, whereas forage was more frequently grown outside of the rotation, on fresher plots. At the end of the eighteenth century, a new continuous rotation model of Flemish origin was introduced, based on the principle that the field should be cultivated uninterruptedly in the following sequence: rooted plant-summer cereal-clover-winter cereal. Such innovations, however, played a limited role in Italian agriculture. By the simple replacing of fallow with two catch crops (especially of maize) in the biennial alternation, there was a transition to a continuous catch crop-cereal succession, not always alternating with hay crops. A ministerial report of 1876 indicates that this was the system prevalently followed in all the Italian regions except for the Po River Valley and Tuscany. In the latter regions, the rotation first followed a four-year pattern known as "classic Italian rotation": maize or another catch crop, grain with clover seed, clover, grain, often followed by an autumn-winter hay crop.[42]

In irrigated areas there was thus a transition to a five or six-year cycle, prolonging the permanence of Leguminosa between repetitions of the base cereal crop, also used for rice in multi-year stable paddies. Between the late nineteenth and early twentieth century, we begin to glimpse important transformations, such as the employing of mineral fertilizers and new seed stocks, and an increase in forage Leguminosa. Many holdings in the Po River Plain, which up to then had mainly produced arable-land crops, began to combine cereal-growing with animal husbandry, and alfalfa and new species such as the beet were included in rotations. In southern Italy, sainfoin and cock's head, which are well adapted to poor and dry soil, gave an important contribution to the improvement of cerealiculture. Bare fallow and pasture resting periods were gradually abandoned. After 1930, alternation became rare outside of Sicily and Sardinia. The "battle for grain" begun in 1925, based on increasing mechanization, intensive fertilizing, the introduction of new varieties, regulation of crop succession, etc., succeeded in increasing per hectare yields from 10 to 16 quintals per hectare in the 1922–1935 period, reducing Italy's earlier massive importation of grain almost to zero.[43] In those years, Italy already held the record for rice-paddy extension among European countries. Although the paddies accounted for only 2 % of cereal-growing surfaces, they were a significant presence in the landscape, being

[41] On this subject and, in general, on the history of agriculture, see Bevilacqua P., ed. (1989): Storia dell'agricoltura italiana in età contemporanea, Marsilio, Padova, 353–450.

[42] On cereal-growing techniques, see the Enciclopedia Agraria Italiana published by REDA, s.v. "cereali".

[43] Luraschi A. (1930): I vari aspetti della battaglia del grano: frumenti, farine, paste, Milano.

practically all concentrated in four provinces: Vercelli, Pavia, Novara and Milan (our catalogue includes a rice-growing area in the province of Vercelli).

As regards the evolution of the overall cereal-growing surface in Italy, the statistics indicate a slight drop in the first half of the century, from 7.3 million ha in 1910 to 6.8 in 1950. The sharpest reduction occurred in the second half of the century:[44] 71,000 ha were lost in the 1910–1929 period, 272,000 from 1930 to 1950, 1,241,000 from 1951 to 1971, 876,000 from 1972 to 1989, and 358,000 from 1990 to 1996; this last decline was in part an effect of EC policy guidelines implemented in reaction to the loss of competitiveness of European and especially Italian cereals on the world market. As regards wheat, the surface remained at ca. 4.7 million ha until 1950, with an increase ranging between 1 and 10 % in different areas of the country from 1910 to 1930: for example, from 2,827,000 to 3,265,000 quintals in 2 years in Puglia (1927–1929), and from 7,490,000 to 10,443,000 quintals in Sicily in the same period. Wheat-growing surfaces later shrank dramatically, down to 2.5 million ha by the end of the twentieth century. The largest decline was in northern Italy, down to 34 % of the surface cultivated in 1910 by the end of the twentieth century. In order of importance, next comes the decline in Sardinia and Sicily (47 %), the south (58 %), and center (68 %). There was also a change in the role of cereal-growing in the landscape as regards its altimetric distribution. The sharpest decrease was in mountain areas, where by 1995 the grain-growing surface was only 45 % of what it had been in 1910, followed by plain and hill areas (respectively 59 and 71 %). It is worth remarking that on the mountains wheat often competed with chestnut, which often offered a higher yield per hectare.[45] It clearly appears that the sharpest surface reduction and deepest changes in the grain-growing landscape occurred in areas suitable to more remunerative crops than grain, such as the Po River Plain, on the one hand, and, on the other, in areas where environmental conditions made cereal-growing more difficult and less productive, such as mountains and the insular regions (Fig. 1.20).

1.4.4 Fruit-growing Landscapes

The notion of "orchard" is relatively modern. In ancient times, fruit trees more often than not were grown on small plots along with vegetables, which the Romans referred to as *horti*. Today, Italy is the most important fruit-producing country in Europe. Industrial policies, however, have deeply modified traditional fruit-growing methods. It was hence especially important to include in our catalogue some fruit-growing areas still retaining their traditional character, including some where the orchards

[44] Toderi G., Baldoni G., Nastri A. (2002): Il sistema delle colture erbacee nel XX secolo: aspetti agronomici dell'evoluzione e prospettive, in: L'agricoltura verso il terzo millennio, Accademia Nazionale di Agricoltura, Bologna. 237–286.

[45] On this and other aspects of chestnut growing, see Pitte J.R. (1986): Terres de Castanide, Fayard, Paris.

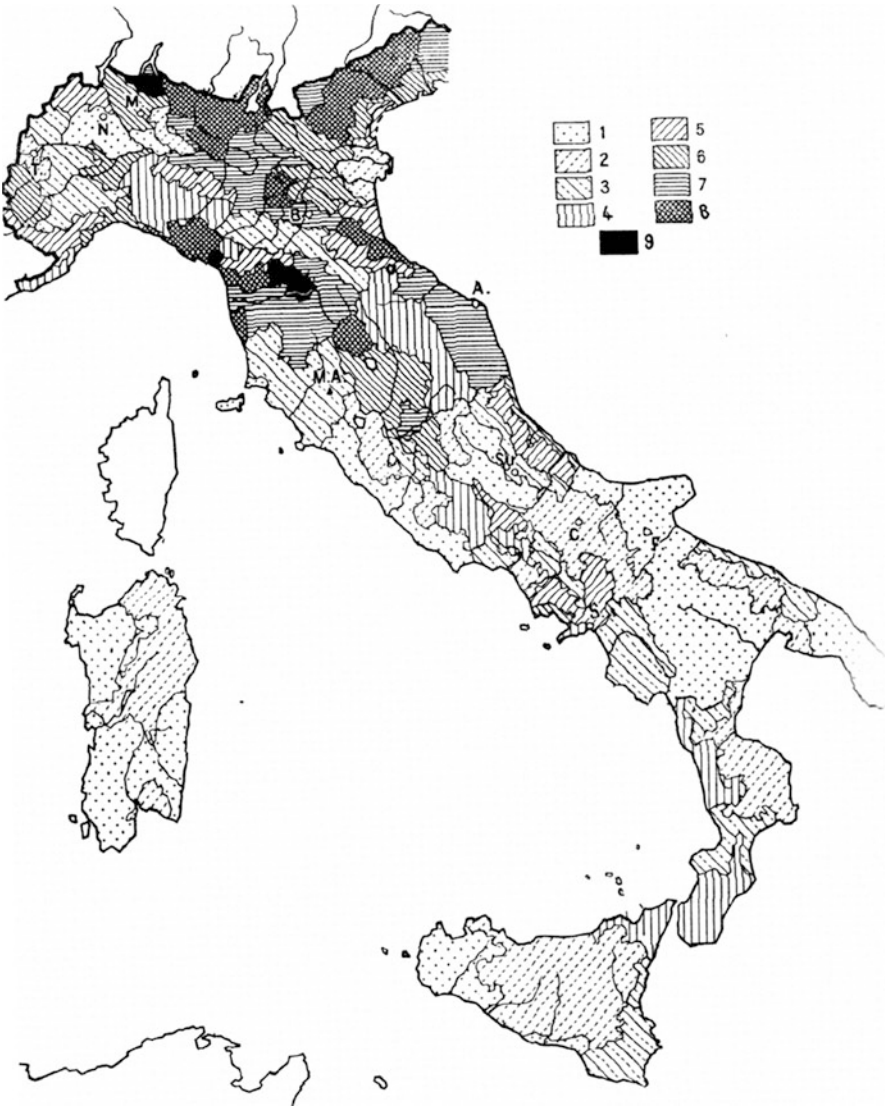

Fig. 1.20 The distribution of mixed cultivations in Italy in the 1960s (Sereni 1961). In this traditional cultivation system different tree species are combined with other crops. The dark areas are the more densely treed. They are a good example of biocultural diversity and have a great potential in terms of biomass. In Italy, the production of fuel wood from trees outside forests was double that from forests, since there were up to up to 160 trees per hectare on farmland

are grown on terraces. Before the twentieth-century transformation, for many centuries scattered or mixed fruit-tree growing systems prevailed, mainly geared to the needs of local consumption. In the course of history there were many fruit-growing areas in the country, with significant differences from one region to the other. For

example, Trentino Alto Adige and Piemonte are known for their apples and pears, Veneto and Emilia Romagna for their peaches, pears and plums. It is southern Italy, however, that yields the highest variety of fruit. Here the thousands-of-years-old cultivations of grape and olive, as well as the citrus orchards, developed before the year 1,000 thanks to the Arabs, are associated with a much higher number of fruit species than in the north, such as almond, walnut, fig, apple, peach, nectarine and pistachio.[46]

Apart from Sicily and its "Mediterranean gardens" described by Sereni, among southern regions it is possibly Campania that was the cradle of fruit growing, in mixed cultivation systems variously associating fruit trees with vegetables, as documented by some of the Campanian areas in our catalogue. In this region, one finds mixed gardens where the crops are arranged on different levels, with vegetables on the ground, peaches above, and on the sides rows of vines trained on walnuts or even taller trees, as described in the chapter on viticulture. This technique was used to spread costs and risks over several products and seasons, but also resulted in a sophisticated landscape, often arranged on terraces, lending substance to the expression "garden of Europe" often employed to describe the Italian rural landscape. In Tuscany there were not just olives and vines on the hills, but also small mixed fruit and vegetable orchards, as in the areas of Rignano and Bagno a Ripoli near Firenze, with their peach trees, which survived until the 1950s in spite of the transition to specialized fruit-growing, and the quince orchards of Val di Pesa, Valdarno, Val di Sieve and Val d'Elsa. It is in Emilia Romagna that industrial fruit-growing was first developed in the early decades of the twentieth century. This and the spread of cereal monoculture spelled the end of mixed cultivation. Industrial fruit-growing certainly led to economic progress, since an average 12 ha holding with a third of its surface occupied by a specialized fruit orchard yielded twice as much as a holding with ordinary herbaceous crops. However, industrialization also led to the gradual disappearance of the polycultural landscape of the Padanian *piantata*, documented in this research (Fig. 1.21).[47]

An important aspect of the landscape value of a crop, besides its aesthetic properties, is which varieties are cultivated and how far back in history its cultivation extends. The presence of peach trees in Veneto is attested by Pliny the Elder, who comments that the price of a peach was higher than that of any other fruit in the first century AD. In the 1700s, the term *peza brolina* was used to designate the often fenced-off area where fruit trees were grown, while olive, grape and mulberry were grown outside. Varieties such as the "Acquar breed" were already exported in the nineteenth century, as much as 1,000 t a year by the early twentieth century. The Verona countryside was the most important peach-growing area in the north. Here interesting techniques were employed such as the tying of the branches, which

[46] For the data on fruit growing in this section, see Sansavini S. (2002): Un secolo ed oltre di frutticoltura, in: L'agricoltura verso il terzo millennio, Accademia Nazionale di Agricoltura, Bologna. 307–382.

[47] Cazzola, F. (2006): Foreste artificiali: espansione e declino della piantata padana (sec. XV–XX), in: Paesaggio Rurale e Sostenibilità, Architettura del Paesaggio, 15, Novembre, CD Overview.

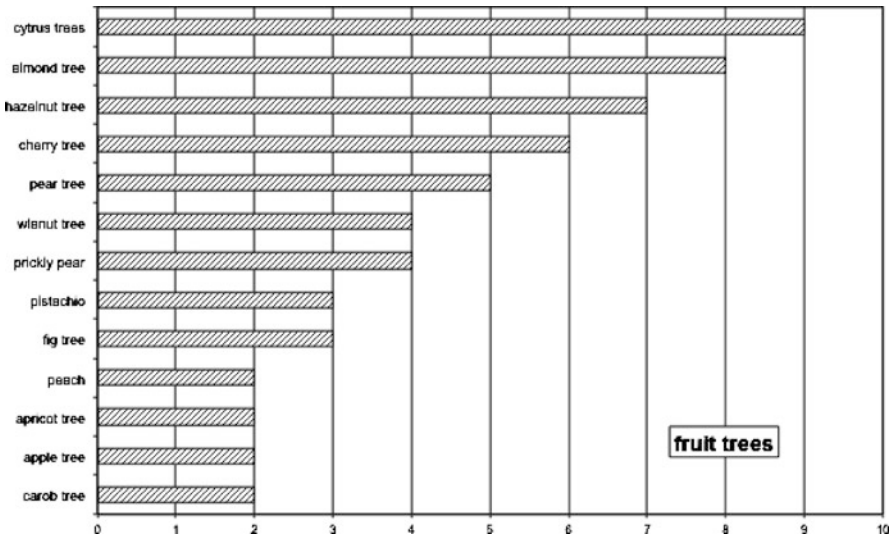

Fig. 1.21 The main fruit trees grown in the areas included in the register

resulted in peculiar aesthetic characteristics. The industrial drift of Italian fruit growing, especially of apples and pears, is especially evident in regions such as Trentino Alto Adige, where historical fruit growing has all but disappeared.

The intensification of fruit growing was achieved through a number of innovations, one of the most important being mechanization, which reduced the need for human labor by as much as 50 %, but required standardization of tree spacing. Some recent innovations, such as permanent no-till farming, allow the mowing of grass for mulching. The same grass, however, was once used as fodder in a synergy of fruit growing and animal husbandry that was typical for this kind of integrated agriculture with low external energy inputs—a very interesting model today for its environmental sustainability and landscape value. The evolution of tree spacing systems and densities has spelled the almost complete demise of mixed cultivation. Reducing the height of the trees to just 2–3 m means going from 500 to as many as 3,000 trees per hectare. The purpose of this is to reduce foliage expanse to facilitate pruning and gathering, and hence cut costs. This technique for maximum exploitation of the soil-energy combination developed especially in Alto Adige in the 1980s. Here orchards of small apple trees are grown, which have replaced the earlier trees with voluminous foliage expanding in a globular or pyramid shape. The trees thus have a different landscape quality, and the orchards tend to lose the aesthetic characteristics associated with local identity. Higher densities, besides cutting costs, usually result in higher yields. In traditional fruit growing, instead, the best yields were achieved by the farms whose trees, thanks to their low densities, attained the highest yields per unit. The trend was hence towards large trees that were pruned to allow the sunlight to shine through the foliage, or whose branches were supported with poles in high-yield years. Until the end of the 1950s, large trees were pruned to obtain symmetrical

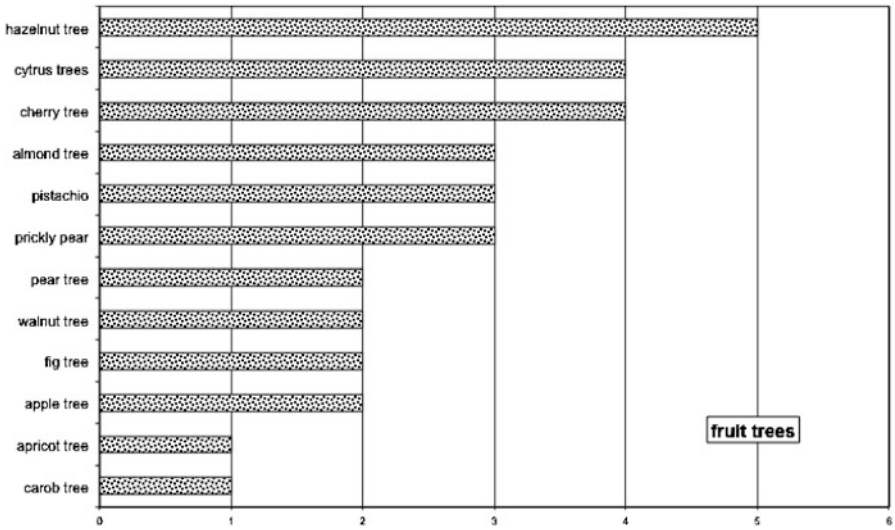

Fig. 1.22 Fruit trees grown in the terraced areas included in the register

arrangements of the branches rising in tiers, with a positive aesthetic and landscape impact (Fig. 1.22).

Another important change occurred in orchard design. Today, orchards are increasingly standardized, a process favored by the need to produce a constant fruit quality at competitive costs. This was not an issue in the past, because the market did not demand uniformity and the trees, growing in isolation one from the other, produced good-quality fruit. Tree-shaping techniques have also seen a trend towards simplification, and their evolution is also a significant historical indicator. The power of imitation resulted in a certain degree of local homogeneity, so that each area developed its own distinctive style. Density and the combination of grafting methods and foliage shape define the architecture of orchards and tree rows (which can be single or double). Another important element is continuity, that is, the degree of contact between the foliage of adjoining trees. In the past, trees were spaced rather far apart. Today, quality is often determined by market demand, and this is reflected in the aesthetic and dimensional standardization of the fruit. To achieve the required quality, growing methods have become much more sophisticated and expensive than in the past, in spite of mechanization. Operational errors in a modern fruit orchard hence have much more serious consequences than in the past, compounding costs and detracting from overall quality.

1.4.5 Mixed-cultivation Landscapes

Mixed cultivation is the growing of several different crops in the same field and it was widely used by the Etruscans, long before the foundation of Roma (750 B.C.).

It reflects the need to make the most of soil nutrients, a limited resource, to obtain a variety of products. In Italian agronomy textbooks of the 1950s, this technique is still described as a valid alternative to specialized crops, providing the best opportunity, especially in the sharecropping system, to exploit the cultivable surface to the utmost to provide a variety of products for the subsistence of peasant families. The fact that in the Italian agricultural landscape some mixed cultivations still survive, in spite of the industrialization of the sector, is not an indicator of backwardness or an inability to innovate; rather, it bears witness to the set of values expressed by these practices, which have held up against attempts to replace them with technical and productive models that have not stood the test of history as well.

Due to their long persistence, they play a fundamental role in landscape conservation and valorization projects. At the beginning of the twentieth century, Italy had 13.7 million ha of arable land. Of these, a good 45 % has mixed cultivations combining different kind of trees with cereals or other crops. Unfortunately, available statistics do not allow us to follow their evolution down to our day, because ISTAT, the Italian government statistics institute, lumped them together with specialized woody crops from 1980 onward;[48] an eloquent example of the scarce attention devoted to elements that do not have a significant function from a technical and productive point of view. What we know is that there was a decline from 13,144,000 ha in 1940 to 2,208,000 in 1980; a reduction by more than 80 %, which speaks volumes about the importance of this transformation of the landscape.[49] Especially striking is the decline of mixed wine-growing from 2,963,000 ha to a mere 445 ha. Mixed olive orchards dropped from 1,360,000 ha to 1,088,000, followed by apple, pear, peach, and so on, down to almond, walnut and hazelnut. As to distribution, Sereni's map indicates a higher concentration in the north and center than in the south. This is explainable as a consequence of differences in socioeconomic structure, which determined a prevalence of sharecropping holdings in the north and center, and of extensively cultivated latifundia in the south. The latter not being worked by renters (sharecroppers) but by waged workers which simply got a salary but had no word on the way the land was cultivated (Fig. 1.23).

The best known mixed cultivation systems are the *piantata padana* in the north and the *alberata* in Umbria and Marche in the center, found in association with landshaping systems such as the *porche* in Tuscany or the *baulatura*—a water drainage system—in Emilia and Lombardy, with many variants. But we should not overlook extraordinary landscapes such as the terraced almond orchards of Gargano or the carob orchards of the province of Ragusa, which have miraculously survived the transformation of the sector and are documented in our register. It is also important to consider the environmental significance of these cultivation systems as an expression of traditional knowledge intimately connected to the local features of the areas where they occur. One only needs to consider that the more abundant presence of humid areas in the north led farmers, ever since antiquity, to train grapevines on trees to

[48] Toderi G., Baldoni G., Nastri A. (2002), Il sistema delle colture erbacee nel XX secolo: aspetti agronomici dell'evoluzione e prospettive, in: L'agricoltura verso il terzo millennio, Accademia Nazionale di Agricoltura, Bologna. 237–286.

[49] Sansavini, op. cit.

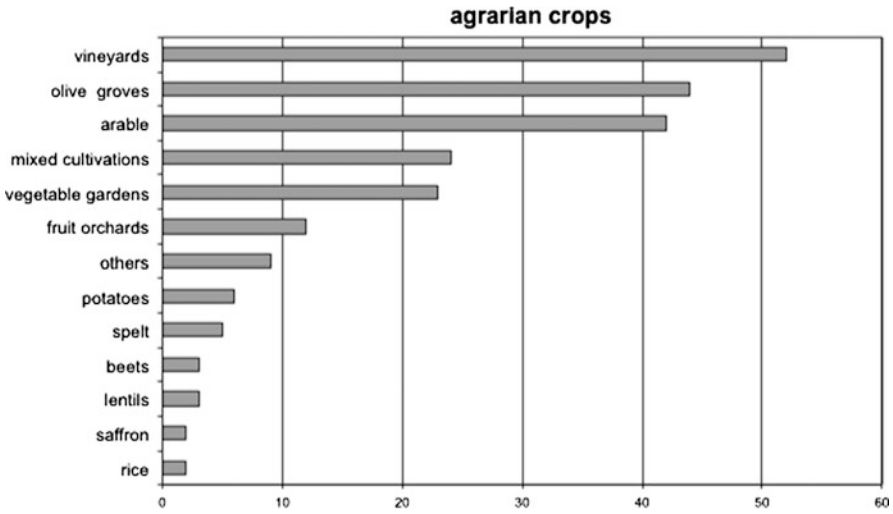

Fig. 1.23 Crops found in the areas included in the register

Table 1.2 Surface changes of the main mixed cultivations types (ha x 1000). Since 1980, ISTAT no longer distinguishes specialized crops from mixed ones

	1910	1930	1940	1950	1960	1970	1980
Grape	3,570	2,974	2,963	2,899	2,578	702	445
Olive	1,799	1,355	1,360	1,437	1,394	1,280	1,080
Apple			1,595	1,523	405	192	62
Pear			1,908	1,749	432	220	83
Peach			1,142	1,062	182	104	47
Plum			898	874	112	71	23
Almond			760	320	457	413	265
Walnut			755	689	148	98	54
Fig			1,273	1,342	264	130	46

preserve them from the humidity of the soil and improve their exposure to sunlight. The higher fertility and higher percentage of irrigated areas in the north (85 % at the beginning of the twentieth century versus 9 % in the south) allowed much more extensive mixed orchards. In dry lands farmed ever since antiquity in Emilia, Romagna, Polesine, the Ferrarese, the Otrepò Mantovano, and the lower plain of Veneto,[50] the holding system was based on mixed cultivation and, hence, the food self-sufficiency of peasant families. Grape was grown by training it on live supports, usually elms, field maples, willows or poplars arranged in rows at the edges of fields. Tree spacing and field width varied according to local tradition, so that tree densities typically ranged from 90 to 180 per hectare. The arable field with trees and vines is hence the paradigm of a mixed cultivation system achieving optimal energy efficiency (Table 1.2).

[50] Some very useful information on this subject can be found in the following essays: Finzi R. (1998): *Civiltà mezzadrile. La piccola coltura in Emilia-Romagna,* Laterza, Bari; Landi F., "Le basi economiche: un sistema ad alta integrazione e bassa produttività", in L. GAMBI (a cura di) (1994): Storia *di Ravenna. Dalla dominazione veneziana alla conquista francese,* Marsilio editori, Venezia, pp. 517–582.

It is worth remarking that vegetable gardens were an important part of the agricultural landscape, often associated with urban areas. Sereni ascribes a great importance to them as early as the Middle Ages. They show a remarkable continuity expressing their still strong rooting in popular culture. Apart from the areas included in the register, they are widespread in many periurban areas, also on publicly owned land. Their small-scale production is used for self-consumption. There exists a broad range of traditional systems to lay them out, which give rise to surfaces that are very heterogeneous, but of great social importance, especially in some vast peripheral areas where urban expansion is encroaching on agriculture.

1.4.6 Terraced Landscapes

The high number of terraced slopes in Italy and their importance deserve separate treatment; they will be also discussed in a separate chapter in this book. Terracing is possibly the most important system of landscape organization in the Mediterranean area. A terrace is never an isolated landscape element, but rather part of a system of land-shaping works that are the fruit of traditional knowledge of construction and farming methods and a perfect understanding of hydrogeological and climatic factors, allowing local populations to make the most of their environmental resources. These are thus self-regulating systems characterized by high aesthetic quality and capable of modeling the landscape by integrating with its natural characteristics.[51] The earliest evidence of terracing in Italy dates back to Neolithic times.[52] Among the terraced landscapes documented in our catalogue, in this case, too, there is a prevalence of those whose origin can be traced to the Middle Ages. It is not surprising, however, that in general statistics most terraced landscapes date from the nineteenth century, when demographic pressure led to a remarkable increase of agriculture on mountains and high hill slopes. Terracing, in the form of grass-covered contour terraces and terraces supported by dry-stone walls, is one of the main forms of adaptation to difficult environmental conditions, considering that mountains and hills cover about 76 % of the Italian national territory and that many plains where covered with swamps in the past centuries, therefore unsuited for agriculture. 16 % of the terraced areas selected for our register are in the mountains and 50 % on the hills, but some are also found in low hills next to plains, bearing witness to the fact that this form of land shaping was also found in not especially acclivitous areas, as a widespread and suitable technique to deal with the geomorphological conditions of our country. Terraces principally house vineyards and olive orchards, but also arable land, pastures

[51] Laureano P. (2004): Il sistema dei terrazzamenti nel paesaggio euromediterraneo, in: La cultura dei terrazzamenti per la salvaguardia del paesaggio, Atti del convegno internazionale, Vietri sul Mare, Maggio 2004, Menabò Edizioni, Salerno.

[52] References to terracing in Trentino can be found in Gorfer, A. (1988): *L'uomo e la foresta, per una storia dei paesaggio forestali-agrari della regione tridentina.* Manfrini Editori, Trento. It is indeed probably in the Alpine area that the need for terracing made itself felt, since early settlements appear to have stood not on valley bottoms, but rather midway up mountain slopes.

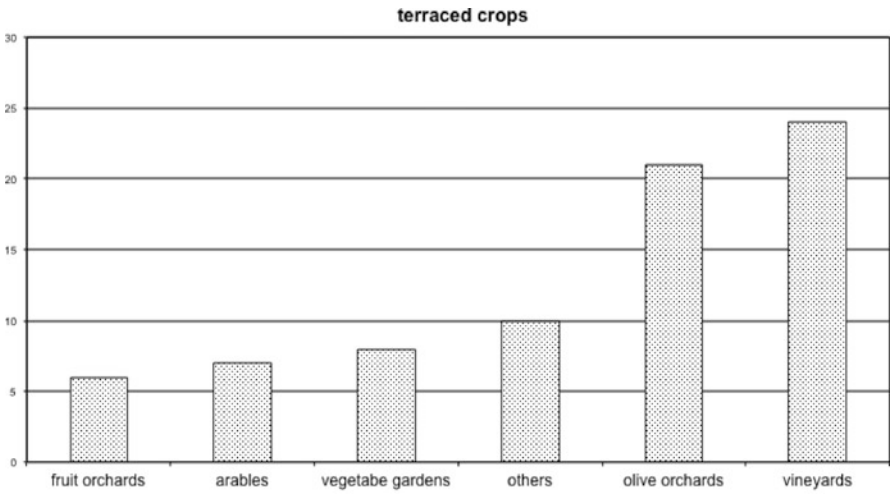

Fig. 1.24 The main crops grown on terraces in the catalogued areas

and woods. Chestnut groves, in particular, are often grown on terraces of various shapes, from structures held by dry-stone walls to "lunettes"—that is, half-round walls surrounding each individual tree. Terracing was also widely employed in the reforestation of the Italian mountains by the State, as attested by an area at the mouth of the Sele river in Campania, included in this register (Fig. 1.24).

Many terraced areas host mixed cultivations, such as grape with olive, and very often fruit orchards, especially of hazelnut and citrus. Terraces offer a number of advantages, especially as regards land stability, by reducing erosive phenomena and preserving the valuable soil. In many areas in Italy, building terraces required cutting into the rocky matrix with sledgehammers and pickaxes, and carrying earth up from the valley on people's shoulders or mules' backs to fill the terraces. These are sometimes Cyclopean works of monumental character, both for their size and considering the large work forces required to build them. They have given rise to "stone landscapes" found in many areas in the catalogue. Their value as a historical testimony of the work of generations of farmers alone would make them well worth preserving, but in addition to this they are an element of exceptional scenic value, both on mountains and in coastal areas. Many terraces, especially in wine-growing hill areas, have been replaced over the years with *rittochino* arrangements, with the rows of plants following the maximum acclivity lines, since farming machines are powerful enough to work on steep slopes. The employment of mechanization has also called for larger plots obtained by totally or partially removing earlier works, without replacing them with equally effective ones, suitable to house the size of the new fields. These techniques, besides having low scenic value, cause strong erosion and a reduction of soil fertility that needs to be compensated by chemical means. The results of a research conducted in an area in the Chianti region in Tuscany are emblematic: In the 1954–1976 period, erosion increased by 900 %. In vineyards arranged slope-wise,

Fig. 1.25 Our research on the landslides in Cinque Terre (Liguria Region) caused by the rainstorms of 25 October 2011 indicates that 88 % of the landslides occurred on abandoned terraced areas covered with secondary forest, whereas only 5 % occurred on well-managed terraces. This shows that traditional practices associated with historical rural landscapes are more effective in reducing hydrogeological risk than renaturalized areas on abandoned land

annual erosion was especially high, about ca. 230 t/ha, vs. the 2–12 t/ha regarded as acceptable. Today, to ensure sustainability and landscape protection, we need to contrast erosive phenomena and hydrogeological deterioration both by employing conservative agronomic techniques adapted to each situation, and by restoring and maintaining traditional structures with high landscape value such as terraces.[53] A research conducted in the terraced area of Cinque Terre (Liguria) after a very intense rain fall causing landslides and causing severe damages to the towns along the coast showed that about 88 % of the landslide occurred on abandoned terraces, covered with woodlands, while well managed terraces remained in good conditions[54]. This shows that well managed terraced systems are often more suited to protect steep mountain slopes than secondary woodlands against hydrogeological risk. To all this should be added that dry-stone walls bring substantial benefits to crops by absorbing heat

[53] Zanchi B., Zanchi C., Le sistemazioni idraulico agrarie collinari quale fondamento della sostenibilità produttiva e della tutela paesaggistica ed ambientale, in: Marinai V. ed. (2009): Paesaggio e sostenibilità. Studi e Progetti, ETS, Pisa, 2009.

[54] The event occurred on 25 october 2011; the research, coordinated by the author, has not yet been published.

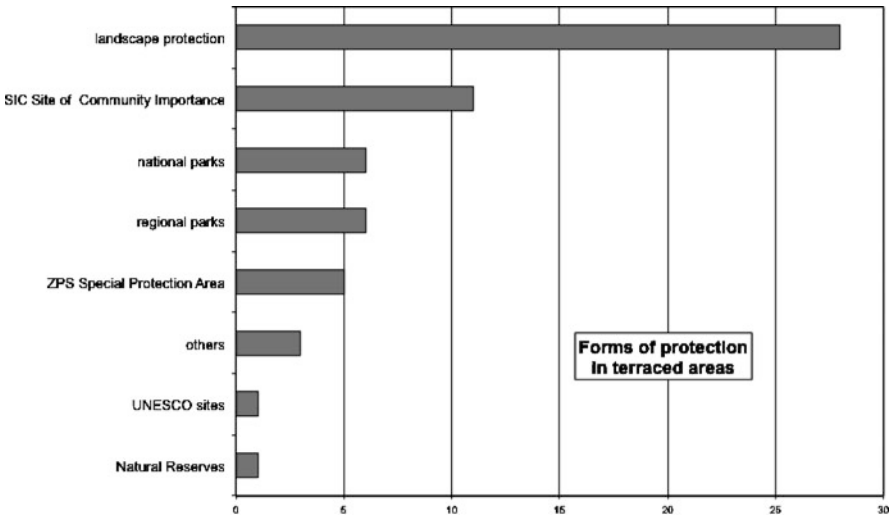

Fig. 1.26 Number of landscape restrictions per each terraced areas. Despite restrictions, terraced areas are constantly declining, mainly as a consequence of abandonment and their colonization by trees and shrubs

during the hot hours of the day and releasing it during the cooler ones. Thus, although their maintenance costs are higher, terraces guarantee the conservation of the most important resource for agriculture, that is, the soil. A vast range of terracing types are employed in our country. Unfortunately we are still far from having reached a comprehensive overview detailing their building characteristics and methods to restore and preserve them, although numerous studies and restoration projects are currently under way. Terraces, both for agricultural and forest maintenance purposes, are not merely valuable testimonies of the cultural heritage of humanity, but also instruments of sustainable development that are worth preserving as an element of traditional knowledge, both in the agricultural and the forestry sector. They are also important for the mitigation of climate change, allowing to cultivate land not suited for farming and also helping to find new cultivated areas in case the sea level will rise, an event often presented as one of the possible effects of climate change (Figs. 1.25, 1.26).

1.5 Meadow, Pastures and Animal Husbandry

Meadows and pastures played an especially important role in the history of the Italian landscape. They contribute significantly to the mountain economy, especially in the agro-silvo-pastoral systems found in many of the areas described in the present catalogue. Pastures are important not just for aesthetic reasons, but also as repositories of biodiversity. This is especially true of wooded pastures. The contribution of pastures to biodiversity is not merely a matter of the variety of animal and plant species found on them, but also extends to their role as “diversifying” elements at the

landscape scale, especially in mountain environments made very homogeneous by compact arboreal covers, which are constantly expanding in the Italian mountains. In fact, the notion of biodiversity does not apply just to individual species, but also to habitats and ecosystems, and hence also to land-uses in a given landscape. In some mountain areas included in the Tuscan landscape monitoring project, an analysis of nineteenth-century cadastral data indicates that meadows and pastures provided the most important contribution in terms of diversity of soil uses and the richness of the landscape mosaic.[55] Unfortunately, pastures and meadows are constantly declining within the national territory. Wooded pastures are disappearing at an especially fast rate, mainly due to abandonment and their consequent colonization by arboreal vegetation. There are some exceptions to this trend in some areas of the south and on the islands, but they do no significantly affect the national trend. The overall extension of pastures and meadows in Italy has dropped from 6,113,000 to 3,346,951 ha from the unification of the country to the present day. The decline of relay-cropped forage fields was especially noticeable. These went through an expansion followed by a rapid reduction, going from 2.91 million ha in 1938 to 3.72 in 1960, then down to 2.12 in 1983 and just 1.20 in 1996. Attitudes toward this reduction of pastureland reflect one of the most powerful contradictions to have emerged in environmentalism over the last decades. Although loss of biodiversity due to the decline of pastures was reported in just about all of Italy's protected mountain areas, and despite the fact that the HABITAT European directive of 1992 is quite clear as to their importance, little or nothing is being done to reverse the trend. It appears that the preservation of the extension of pastures is being left to catastrophic events such as fires.

Only some regions in the northeast, notably Trentino Alto Adige and Friuli, have introduced in their rural development plans measures to limit the advance of woods on pastures. In many other regions, including those with landscapes historically characterized by great landscape complexity, like those of central Italy, there has been an almost total lack of initiative; on the contrary, the common opinion is that inaction is the best course. On the Alps, the *alpeggio*, vertical transhumance system, has played a fundamental role in expanding and preserving pastures, thanks to its organization revolving around pastoral farms (*malghe*) and the subdivision of pastures into lower, middle and upper stations, used in succession from the bottom up along routes and mid-mountain halting places where flocks would sometimes stay as long as several weeks. The periodic migration of the animals created an interdependence between the landscapes of the valley and those of the mountain. The transformation of animal husbandry and mountain society hence determined a change in both landscape systems, which today have become independent of one another. This is one example among many of polarization as a result of specialization, a typical aspect of the evolution of the rural landscape over the last years (Fig. 1.27).

Compared to the Alps, pastures on the Apennines are more diverse, partly due to a lower presence of good forage species. For this reason, besides simple pastures, in the

[55] This trend is observable in all the mountain areas studied in Tuscany. See Agnoletti M., 2005, Dinamiche del paesaggio, biodiversità e dissesto idrogeologico nella zona di Cardoso fra il 1832 il 2002, Regione Toscana, Tipografia Regionale, Firenze; Agnoletti M., 2007, Il Parco del Paesaggio Rurale Appenninico di Moscheta, Pacini, Pisa.

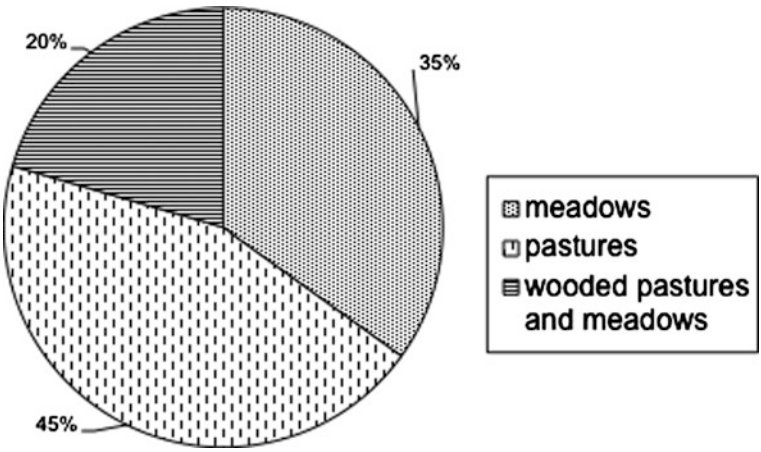

Fig. 1.27 The presence of pastures and meadows in the catalogued areas. Pastures are declining constantly in the Italian landscape

course of time more complex systems were developed to "activate" environmental resources, as described by Diego Moreno. In these systems, trees and the grazing grounds are intimately connected. There were thus different types of Apenninic pastures, including bare pastures, wooded pastures, and pastured woods, with a lot of variants within each category. Wooded pastures offered several benefits. Trees with ample, if sparse, foliage granted shade for the animals in the hot hours of the day, lowered ground temperature, and preserved humidity, creating the best conditions for the underlying vegetation. Besides, they yielded useful produce for agro-silvo-pastoral farms, such as fruit and fodder. Apenninic pastures lie at lower altitudes than Alpine ones, and have a shorter rest period and a longer grazing season: from 120 to as much as 180 days, vs. 50–100 on the Alps. Water resources, however, are less abundant.[56] Regions like Sardinia are exceptional cases, where winter grazing is possible and pastures are usually left to rest in the winter.

It is worth remarking here that the Apenninic landscape was not shaped just by agronomic factors but also by environmental ones, such as acclivity, the geological substrate, and rainfall, which in our country occurs on less days per year but with higher intensity than in other European countries whose landscapes are not as "vertical" and where rainfall is spread out over a higher number of days. When the grassy cover of a very acclivitous slope becomes too thin or is reduced by an improper use of fire, very intense rainfall can determine erosive phenomena. Actually, fire can be used to keep the grass cover of slopes in good condition and thus control erosion. For years pastureland has been regularly managed by means of controlled fires with support from the forestry service of the French government.[57] Indeed, in

[56] Talamucci P., 1975, Agricoltura Montana e Alpicoltura, Clusf, Firenze.

[57] Lambert B., 2008, Bilan et perspective du réseau Brûlage Dirigé, Cardère Editeur, Lirac.

the Mediterranean region fire has been used for pasture maintenance for 1,000 of years, ever since the Bronze Age.[58]

In the Apennines, as on the Alps, cattle were herded down to the plains in the winter. In Tuscany, bovines migrating from the Apennines to the Maremma performed a range of functions once they had reached the plain, and thus played a role in shaping the local plain landscape. The end of the transhumance of flocks of thousands of sheep from the plains of Lazio and Abruzzo to the Abruzzo mountains led to major changes both in the livestock economy and in the landscape. It was partly caused by the decline of forage resources in the lowlands (Tavoliere, Metapontino, Tyrrhenian coast, etc.) as a result of the reclaiming of land and its consequent conversion to agriculture. This process gradually led to a shift to sedentary sheep flocks residing on lower slopes during the winter and herded uphill in the summer. The present problems faced by sheep husbandry of course depend from the difficulty of finding new recruits willing to embrace the nomadic and austere life of the shepherd, on the one hand, and from other social changes that have led to the abandonment of the mountains, on the other.

The problem of the decline of pastures and their economic marginality is compounded by the loss of the traditional knowledge required for proper management of pastures, especially wooded ones, a subject that never received systematic treatment in scientific texts and can hence often be found only in oral traditions. In Italy, the combination of trees and grazing grounds was found in a variety of systems, for example in chestnut groves, or fruit orchards mixed with grapevine, where sowing or at least grazing was possible, or in very different altitudinal and climatic situations, as in the case of the carob groves of southeastern Sicily. The pruning of trees for purposes connected to grazing is still practiced in several areas in the peninsula today, although it is almost never acknowledged in technical-scientific treatises. The practice still places its stamp on extensive landscapes, such as those found in Sardinia, which are often regarded as a degradation of pristine forest vegetation.[59] Comparisons between areas shaped by practices connected to livestock grazing—such as mowing or periodic burning—and abandoned areas indicate that in the regularly managed areas there is a higher diversity of herbaceous species suitable for grazing.[60]

The cycle of the speckled alder ("alnoculture") on the Ligurian Apennines illustrated (Fig 1.1 in the chapter by Moreno and Cevasco), is an illuminating example of the ecology of certain temporary agriculture systems that remained in use until the early twentieth century. This practice, which may appear relatively more sophisticated than others, is just an example of the many forms of traditional knowledge found all over Italy, whose application resulted in very elaborate

[58] Grove A.T., Rackham O., The Nature of Mediterranean Europe. An Ecological History, Yale University Press, London, 2001.

[59] Beccu E., 2000. Tra cronaca e Storia le Vicende del patrimonio Boschivo della Sardegna. Carlo delfino Editore.

[60] Cevasco R., 2007, Memoria verde, nuovi spazi per la geografia, DIABASIS, Reggio Emilia.

landscapes.[61] The quantitative and qualitative evolution of pastureland and meadowland did not depend just on the abandonment of mountain areas, but also on changes in animal husbandry itself, notably as regards herd size, breeds and breeding methods. At the beginning of the century, Italian livestock displayed great phenotypic variety, largely reflecting the different environmental characteristics of the areas where it was bred, in a country that has one of the highest degrees of variability in Europe, especially as regard the physical environment. Thus, as late as the beginning of the last century, there was a high degree of genetic variability among livestock, partially as the result of adaptation to a variety of mountain, hill and plain habitats, which favored the formation of true zootechnic niches.[62] Thus, for a long time there was an interest in local breeds on farms that were deeply rooted in their local area and had little inclination to sell their animal products beyond the local market, being more interested in the service the animals could provide to the farm itself. After World War II, agricultural mechanization replaced draught animals, modern livestock farms were introduced, and the frozen food industry and improved transportation allowed commercialization on an unprecedented scale. All this set the stage for a radical transformation of the sector, which led to a four to fivefold increase in the consumption of beef and pork, although with a drop in the percentage coming from national production. By the 1970s or 1980s, the biodiversity of Italian livestock was seriously undermined by the selection of only a few breeds with characteristics complying with market trends. As intensive livestock breeding spread, animal husbandry was gradually abandoned in many areas of the country. While earlier on animal husbandry was deeply connected with the landscape and, hence, the physical environment and local traditions, now those ties were completely severed. The relationship between human beings and domestic animals must therefore be acknowledged today as an important factor for the safeguarding of landscapes in their economic, social and environmental components. In this regard, another issue that needs to be dealt with is the growing competition in many areas in the country between domestic and wild animal species, where the latter often prevail. This, again, is the result of attempts to steer the mountain landscape towards a generic "naturalness" whose benefits, whether for local populations or for the landscape itself, are not clear.

One cannot discuss pastures without briefly dealing with the evolution of animal husbandry, as least as regards bovines. Until the 1960s there was a constant increase, up to 10 million heads, then a sharp decline coinciding with the replacement of animal with mechanical power, down to 7.2 million in 1996. There were also very significant changes in the size of livestock farms and their distribution over the national territory. In 1930, more than 60 % of the cattle was raised on farms with 1–10 heads each. This percentage dropped to 51 % in 1961 and 15 % in 1982, while farms with more

[61] Moreno D., Cevasco R., Guido M.A., Montanari C., 2005, L'approccio storico-archeologico alla copertura vegetale: il contributo dell'archeologia ambientale e dell'ecologia storia, in: G. Caneva (ed.), La biologia vegetale per i beni culturali, Nardini, Firenze, 463–498.

[62] For some considerations on this subject, see Rognoni G., Caroli A., Bagnago G., Gandini G., 2002, L'evoluzione del patrimonio zootecnico italiano, in AA.VV., l'Agricoltura verso il terzo millennio, Accademia Nazionale di Agricoltura, Bologna. 385–440.

than 100 heads increased from 4 to 33 %. This trend reflects a major change in farm organization and a gradual increase in stabled livestock.[63] During this period, about a million farms gave up cattle raising, with strong landscape repercussions in terms of crop distribution and soil fertilization. The elimination of legume hay fields and the disappearance of organic fertilizer had a major impact on soil fertility and the environment as a whole. Intensive livestock farming gave rise to animal excrement disposal problems. As regards breeds, in the first half of the twentieth century the Alpine arc was still in total symbiosis with the Po River Plain. The district as a whole had a high variety of autochthonous ecotypes (about 10). Bruna Alpina bovines were mainly raised in its central stretch, whereas Valdostana and Piemontese prevailed in the west. Over an area including Lombardy south of the Po and western Emilia Romagna, running into the Apennines, were found breeds such as Reggiana and Bianca Val Padana, and Podolica in the Polesine district. The area at the confluence of the Ligurian, Lombard, Piemontese and Tuscan Apennines housed true genetic niches of bovines with different aptitudes (work, milk, meat), including Cabaninna, Montana, Pontremolese, and Garfagnina, each breed with several distinct strains. Central Italy had its own autochthonous cattle: Romagnola, Chianina, Maremmana, Pisana, and Marchigiana, with their variants and derivations. In southern Italy, the first part of the twentieth century witnessed a prevalence of Podolica, with various regional strains and infiltrations of Bruna alpina and Pezzata rossa, while in Sardinia there was a local population, already partially crossed with Bruna alpina, that later became Bruna sarda. Another breed found on the island was the Sarda modicana, which was also raised in inland Sicily, along with Cinisara and Siciliana.

The 1950s witnessed indiscriminate importation of Bruna alpina bovines from Switzerland, as well as Dutch and American Frisone, which brought diseases heretofore unknown in Italy, such as leucosis. A massive replacement of Bruna alpina with Dutch and American Frisone in plain areas thus began, and went on until the 1970s, while Simmenthal red-dappled bovines were being imported from Switzerland, and red-dappled bovines later on from Austria and Germany. The gradual spread of cosmopolitan breeds (Frisona, Bruna, Pezzata rossa) led to a reduction of autochthonous ones, which are holding out in the areas they are best adapted to. Some are almost extinct, such as the Burlina in the eastern Alps, and the Cabaninna, Montana, Pontremolese and Garfagnina in the northern Apennines, as well as the Pisana, Agerolese, Cinisara and Modicana sarda. From the 1980s onward, there were further importations, this time of Charolaise and Limousine French beef bovines, respectively to Latium and Sardinia, and to the northern Apennines. This whole evolution went hand in hand with a considerable reduction of genetic variability as a consequence of a trend to promote only the cosmopolitan breeds, wrongly believed to be capable of improving the economic potential of various areas in the country. Only belatedly did farmers realize that for a more efficient use of different local conditions, and hence different landscapes, they should have rather set their

[63] On this subject, see Toderi G., Baldoni G., Nastri A., 2002, Il sistema delle colture erbacee nel XX secolo: aspetti agronomici dell'evoluzione e prospettive, in: L'agricoltura verso il terzo millennio, Accademia Nazionale di Agricoltura, Bologna. 237–286.

stakes on improving local breeds, since these only can ensure adequate yields in such difficult environments, and preserve the characteristics of typical local products. The case of buffaloes is especially interesting. The Italian national tradition saw the buffalo as a typical marshy-plain animal, and hence very useful for the management and utilization of these marginal areas. In 1908 there were about 20,000 heads, 4,000 in central Italy and the rest in the South. Major reclaiming works reduced humid areas especially suitable for buffalo grazing, thereby undermining both buffalo populations and traditional breeding practices. In the second postwar period, there was a strong recovery of milk production. By 2006 there were 230,000 heads just in Campania. This success obviously depended on the popularity gained by buffalo mozzarella, which however today is facing competition with similarly named products, including some that are based on cow milk. This state of things suggests that promoting mozzarella is not merely a matter of verifying the quality of the milk and defending a generic typical character; it requires making the most of a relationship between the product and the landscape that produced it to ensure that the quality of the product truly reflects the overall quality of its production area.

Ovines and caprids also played an important role in the Italian landscape, especially in open spaces and above all in southern Italy. Until World War II, there was a decrease followed by a recovery up to a peak of 10.3 million ovines and 2.5 million caprids in 1950. There was another decrease until 1970, and then a new increase back to the levels of 1950. However, today only 10 % of the ovine population is in the north, while the remaining 90 % is in the center and south. Among ruminants, sheep and goats are those that can make the most of the spontaneous forage growing on low-fertility soils, as well as residual growth on cultivated soil that is only suitable for grazing. Hence the important role of caprids and ovines in many Italian landscapes. Sheep husbandry could be either sedentary or transhumant. Transhumance, in its turn, could be short-range and vertical or long-distance and interregional. The former was found especially in the Alps and Prealps, in the northern Apennines and along the coast, whereas the latter was mainly practiced in the center and south. Thus, over time an interdependence arose between the landscapes of different areas, with social and economic implications. Systems arose connecting the regions of Maremma, Latium, and Puglia, and the Lucanian and Calabrian coasts, with their respective Apennine ranges, and the coasts of Sicily and Sardinia with the mountainous interior. There were also, as I mentioned, sedentary forms connected to agricultural activities. The recovery that followed the decline of ovines until the 1970s was a consequence of a regaining of favor of sheep milk and cheese, an increase in the consumption of sheep and goat meat, and the gradual abandonment of cultivated hill slopes. The loss of interest in wool, which was no longer competitive on the international market, determined a shift towards meat and milk breeds. The Sardinian tradition of milk sheep was thus introduced to continental Italy. The two milk breeds, the Comisana and the Sarda, spread over areas once occupied by sedentary bovines and transhumant ovines. In this case, too, genetic variability has significantly dropped over the years, although sheep breeds such as Altamurana, Gentile di Puglia, Massese, Leccese and Sopravissana still survive. In this case, too, the question arises whether Italy's conspicuous heritage of typical cheeses—at least 400 according to a research

by the Institute of Rural Sociology in Rome, including the whole bovine cheese sector—should not be more clearly associated with the many landscapes historically connected with cheese production. Recovering space for pastures, besides providing organic fertilizer useful for biological and biodynamic agriculture, would also allow the production of quality meat and reduce the threat of epidemics such as those that plagued the north European bovine population, like the "mad cow" disease.

1.5.1 Forest Landscapes

The Italian woods were once deeply integrated with agricultural activities to provide many products and services needed for agriculture and animal husbandry. This is not true, however, of all of the country's woods. Ever since the Middle Ages, some woodlands were shaped by the production of timber and firewood, not only for the requirements of local farmers and herdsmen, but largely to meet the demand of the construction and shipbuilding industries. Woods were put to this use especially in the Italian northeast, the area in the country where the timber industry developed to the highest degree.[64] Our research records different types of woods and identifies the principal forms of forest management and the traditional practices that go with them. Among these, chestnut growing holds a special place. It gave rise not just to a landscape, but to a whole "civilization", as it was dubbed, whose importance was such that the chestnut landscape holds an especially significant place among Italian historical landscapes and reforested areas. Although they cannot boast special aesthetic value, chestnut woods undoubtedly stand as the result of one of the largest-scale attempts by the government of united Italy to improve the mountain environment. In Italy, wooded areas are mostly located on mountains (52 %), versus 38 % on hills and 10 % in plains. Wooded landscapes differ historically from other landscapes in that a higher percentage developed in the seventeenth and eighteenth century, although most date back to the Middle Ages. Further differences regard forms of ownership, since prevalently public property plays an important role in wooded areas, as does common property. This is a legacy of the very ancient forms of community management found in many mountain areas and of the more recent institution of State property of forests after the unification of Italy (Fig. 1.28).

1.5.1.1 High Stands

High stands are the form to which woods tend in their natural state. High-stand management, instead, is a form of silviculture aimed at producing lumber, especially

[64] An exemplary case is that of the forests of the upper Belluno province and Trentino. See Agnoletti M., 1998, *Segherie e foreste nel Trentino dal medioevo a nostri giorni,* Collana monografie etnografiche trentine, Museo di San Michele All'Adige, San Michele All'Adige.

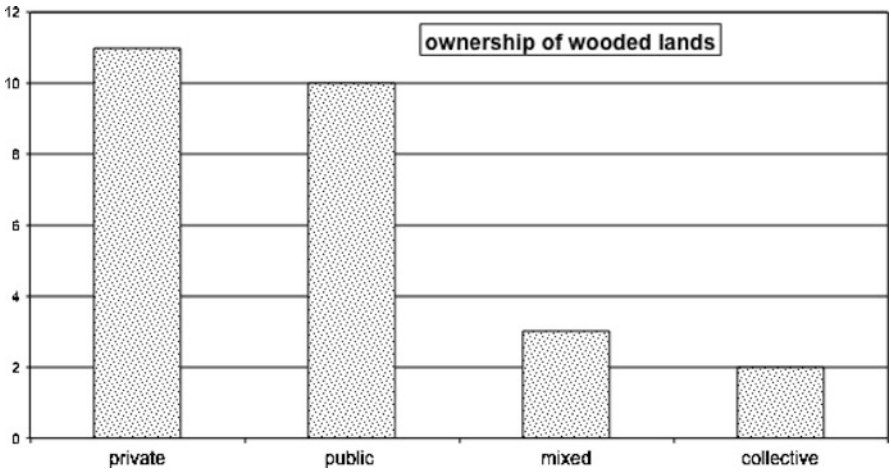

Fig. 1.28 Wooded areas are characterized by an almost equal importance of private and public property

beams and planks. From a landscape-historical perspective, it should be kept in mind that for many centuries high stands of oak were mainly used as grazing grounds. Not much is know about the technical aspects of this practice, because foresters either lacked interest in wood grazing or, more often, regarded it with outright hostility. There were other kinds of managed woods which have been abandoned today, such as "navy woods" providing timber for shipbuilding—including some oak woods that were very suitable for a combined use as grazing grounds -, chestnut woods, coastal domestic pinewoods producing pine-nuts, cork woods, and the less well-known manna ash groves (Fig. 1.29).

The principal historical management forms of high stands included clearcutting, that is, the felling of all the trees in a given patch of woods, and selection cutting, which involved felling only the trees that reach maturity. Both practices were known as early as the Roman period. These two management forms were supplemented with others, such as successive cutting, involving intermediate approaches adapted to different species. Modern forest science has systematized these approaches, which are widely documented in silvicultural texts. Clearcutting and selection cutting have given rise to completely different landscapes, and are rooted in equally different cultures. In Italy, selection cutting is much more widespread than clearcutting. It established itself as a systematic practice carried out for commercial purposes especially in Veneto.[65] In the Adige valley, however, only a short distance from the Piave valley in Veneto, clearcutting prevailed. Here the practice was rooted in the influence of German-speaking populations, but was also used by the monks of Vallombrosa in the seventeenth century to manage their fir forests. As in the case of coppices,

[65] Agnoletti M., 1993, *Gestione del bosco e segagione del legname nell'Alto Bellunese—Il bosco.* Cit.

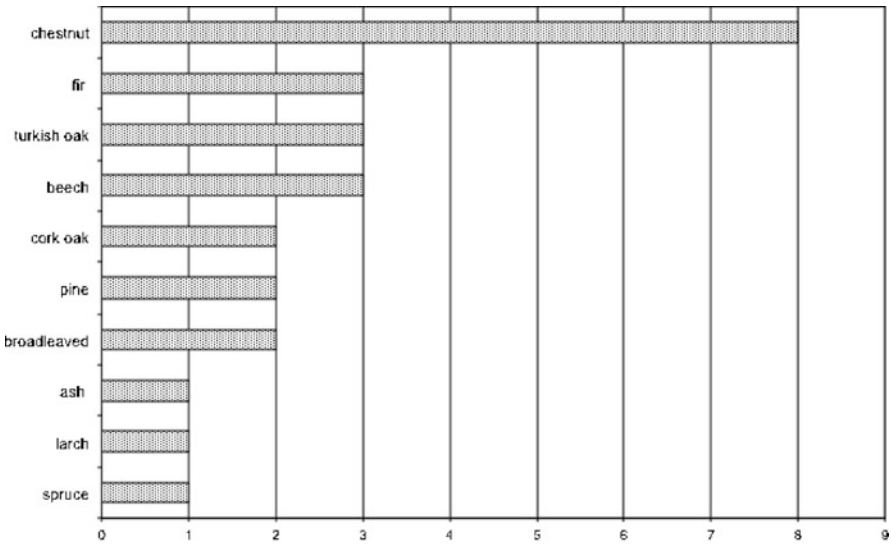

Fig. 1.29 The principal categories of wooded landscapes recorded in the research. The chestnut orchards have a major historical significance in the Italian landscape. They were introduced by the Romans and provided a high number of products to farmers, from timber to flour and nuts, and also served as grazing grounds

clearcutting produces bare surfaces where one must wait for the tree to grow and attain maturity. In the cases of conifers such as fir and spruce, this may take all of a 100 years. The practice thus results in bare patches with regular shapes with long permanence through time, and that do not produce an aesthetically very pleasing effect. The clearcutting vs. selection cutting debate was also prominent in the initial stages in the development of Italian forest science at Vallombrosa, where the methods adopted by the first forestry school founded there by the Italian government in 1869 had an important effect on the landscape.[66]

Selection cutting produces woods with trees of different age classes and, accordingly, different heights and sizes. The composition of such woods is hence closer to what that of natural woods should be. The only region in Italy, however, where the application of this technique is associated with a well-established relationship between the timber industry and the landscape is the Cadore. In selection cutting, the tree is felled when it has reached maturity. In the Cadore method, however, maturity was interpreted strictly in commercial terms, to provide specific assortments required by the market.[67] Thus, trees were cut when they attained or exceeded a

[66] Agnoletti M., 2005, Riflessioni sul ruolo del paesaggio nella cultura forestale italiana, in "Foreste, Ricerca, Cultura, scritti in onore di Orazio Ciancio", AISF, Coppini, Firenze, 1–20.

[67] Agnoletti M., 1993, *Gestione del bosco e segagione del legname nell'Alto Bellunese—Il bosco,* in La via del fiume, edited by Giovanni Caniato, Cierre Verona. 75–94.

given commercially viable size. While forest utilizations have not always taken account of such rules, selective cutting became the prevalent method employed by the Italian forestry school, after early experiments with clearcutting and other methods of German economic silviculture. These management forms became very popular all over the world, thanks also to the british "imperial forestry", but in Italy remained mainly restricted to conifer forests.

1.5.1.2 Conifers and Broadleaved

The more general issue of timber production and reforesting has regarded a large part of the Italian tall woods ever since unification. Beginning in 1869, the Italian forestry school of Vallombrosa initially strove to improve revenues from woods, and hence had a keen interest in the approaches of the German forestry school. The latter focused on economic silviculture, and hence favored coniferous over broadleaf woods. Under this influence, the main interest was in conifers and this, to a certain degree, led to a change in the forest landscape, possibly in certain areas in the northeast more than elsewhere. Another important factor increasing conifer forests was the development of a forest policy strongly oriented to afforest the mountain for reducing hydrogeological risk and erosion, since the species chosen to colonize the soil was black pine, more adaptable to arid and shallow soils. It was a huge program, lasting for more than one century, which led to several conflict with farmers in the mountain areas who were not allowed to farm the land or create pastures any longer in afforested areas. The creation of the forest police corps during the fascism and the enhancement of several laws favoring afforestation and forest protection can be interpreted as the attempt to impose a "state landscape" on the existing "social landscape", a tendency not different from what happened in countries under the British domain, as in India, but also from what is happening today with nature conservation. Historical variations in percentages of coniferous and broadleaved are partially documented by statistics, although their reliability is often questionable. The ratio between the two appears to have remained unchanged until the second postwar period, when a slight increase of conifers and decrease in broadleaved is recorded, but here, too, there is some perplexity regarding the accuracy of the data. Total afforestation between 1862 and 1950 is estimated at 194,000 ha, but summing this figure with subsequent afforestation, estimated at ca. 850,000 ha, would yield a total of over a million hectares, mostly of conifers. A great portion of the coniferous woods presently found in the Italian landscape are the result of state afforestation programs, spontaneous reforestation of former pastures or fields, or areas destroyed by fires, mainly by pines, naturally growing in burned areas. It is worth nothing that despite the fact that forests have more than doubled their extensions since the Unity of Italy to nowadays, the country is still importing about 80 % of its timber need from abroad as at the end of the nineteenth century. In those times, foresters claimed that the country need about 1,500,000 ha of new forests to reduce our timber import. History showed that "quantity" was not an issue, still today some says that the country need more forests (Fig. 1.30).

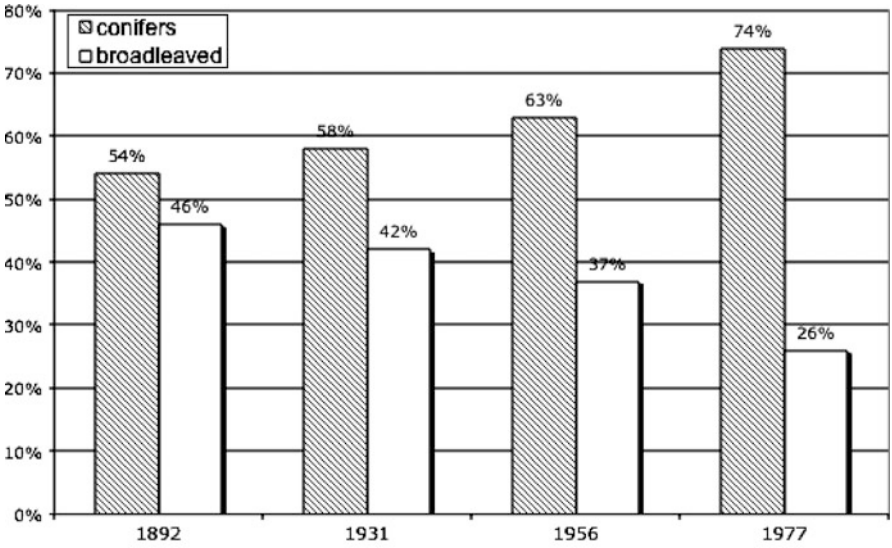

Fig. 1.30 Evolution of the ratio between coniferous and broadleaved in the landscape of Trentino region. Here the production of timber brought about the most significant changes in the specific composition of forests, favoring the spread of conifers since the sixteenth century. Most of the public opinion ignores the cultural origin of the Italian forests, while the information given are often presenting them as natural or seminatural

1.5.1.3 Coppice Woods

Coppices, already found in Italy in the Roman period, have been prevalent in the Italian landscape only for the last 150 years. Between 1868 and 1911, one observes a noticeable decrease of high stands and their replacement with coppices.[68] Today, coppice woods—often old and aging due to disuse—make up most of the Italian wooded landscape. They are usually low woods, managed with rather variable cutting shifts, found on mountains and hills, and along the coast. The spread of coppices is due to their great capability to integrate with agricultural activities. Firewood, however, usually converted into charcoal on the spot, was always one of their main products. Yet another reason for the popularity of coppices is that they provide more frequent periodic yields than high stands. Charcoal production has left many traces in the landscape; most notably, charcoal burning sites, still found in beech woods on the Apennines. These are terraces of sorts dug into the mountain slope, with densities up to 5–10 per hectare. As an example illustrating the intensiveness and high landscape impact of charcoal making in Italy compared to other countries,

[68] Agnoletti M., *Bosco ceduo e paesaggio: fattori generali e processi locali,* in Orazio Ciancio e Susanna Nocentini (eds), Il bosco ceduo in Italia, Accademia Italiana di Scienze Forestali, Firenze, 2002, 12–21.

one could cite Sweden, where an average of one charcoal clearing every 12 ha was recorded.[69]

As many have observed, coppicing is a sort of "poor man's silviculture", but its evolution nevertheless ran parallel to that of Italian economy and society as a whole. The expansion of the industry and the constant growth of per capita consumption increased the demand for firewood and charcoal, the only kind of woody assortment for which Italy was at least partially self-sufficient. The population's consumption, however, followed different patterns in town and country. In the towns, firewood and charcoal from the woods was mainly employed. This was the main reason for the conversion of high stands into coppices, which eventually became prevalent in Italy. Charcoal was preferably produced from coppices because the stems were smaller in diameter than those of high forests and hence did not need to be chopped to build the charcoal kilns; besides, coppices produced a higher number of timber assortments. The situation was different for the rural population, which was much larger than the urban one. In the countryside, the demand for firewood was often met by gathering it outside woods, by cutting tree rows or hedges, or pruning trees in fields. This production allegedly increased by almost 50 % between 1861 to 1912, going from 9 to 13.5 million cubic meters. Most of this firewood, more than twice as much, came from sources other than woods. These statistics are consistent with the popularity of mixed cultivations. Indeed, in traditional Italian agriculture the density of trees planted in fields was often higher than that of many woods. An important factor in the landscape impact of coppicing is the extension of the cut areas. As in the case of clearcutting in high forests, the bareness of cut patches is especially conspicuous in compact and homogeneous woodland, with varying effects on the aesthetic perception of the public. Their presence, however, is relatively short-lived, since after a year suckers begin to sprout from the stools, and within a few years the woods regain their original appearance. Actually, policies and studies for the conservation and promotion of traditional forest landscapes should base their evaluation of these or other wood management practices on their rooting in the local culture (Fig. 1.31).

Coppicing, in its various forms, is certainly one of the techniques that contributed the most to the evolution of the Italian wooded landscape into the cultivated space described by Sereni; a process that goes as far back as the Middle Ages. An overview of the various forms of coppices found in Italy is enough to bear this out: simple coppice, with standards, mixed coppice (coniferous and broadleaved), uneven-aged, limbed, pollarded, *a saltamacchione*. Each of these, in its turn, is variously combined with a wide range of cutting rotation periods (from 3–4 to 30 years) and different standard selection methods, utilization techniques, and tree species to produce a very high degree of landscape diversity. Equally diverse are the aesthetic and scenic

[69] There is a remarkable literature on the archaeology of charcoal production in Italy. Cf. Montanari C., Prono P., Scipioni S., 2000, The study of charcoal burning sites in the Apennine mountains of Liguria (NW Italy) as a tool for forest history, in Agnoletti M., Anderson S., (Ed.), Methods and Approaches in Forest History, CAB International, New York.

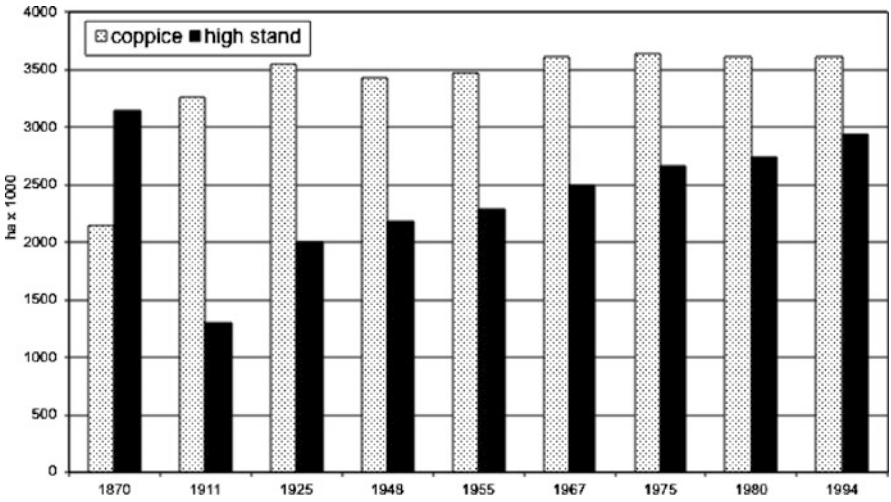

Fig. 1.31 Distribution of coppice woods and high stands in Italy from unification to the present day. Coppice was one of the most useful form of management for fuel wood and many agricultural uses

effects produced by the chromatic variety of differently managed woods of different species from one season to the other. There is also a whole range of interesting local traditional practices such as flush-cutting or low-cutting of the stools. Coppicing was carried out with special tools that differed from one region or valley to the other. The 160 or so types of Italian axes and adzes classified by Giordano,[70]along with other tools such as billhooks, saws, etc., are certainly less than the total existing types. In agricultural areas, coppices are more extensive. Thus, 37 % of areas below 500 m a.s.l. are covered with coppices, and only 16.7 % with high stands. The prevalence of high stands at higher altitudes on the Apennines does not depend just on the rarefaction of agricultural activities, but also on the fact that over the last few decades foresters have been converting many beech coppices formerly used for charcoal into high stands[71]. It is interesting to note that many of these forests are now included in many protected areas of the NATURE 2000 network, or in parks, and are often presented as "natural habitats" to be preserved according to the EU Habitat Directive of 1992. Coppices of some species, especially chestnut, can produce a whole range of assortments. Coppices with three or five-year rotations in the province of Reggio Calabria yield eight different assortments for hoops and staves for barrels and casks; two assortments for poles; *cervoni* (tile supports); and wickerwork (*sbarre* and *verghella*) for baskets. In the same area, 15 to 18-year-old coppices once yielded all of 16 different types of beams. In the Naples area there were at least 27 different types of assortments for containers for

[70] Giordano G., 1956, Il Legno, dalla foresta ai vari impieghi, Hoepli, Milano.

[71] 1963, *La conversione dei cedui di faggio,* L'Italia Forestale e Montana, XVIII, 2, 62–75.

foodstuffs and other goods. This diversification is indicative of a society that used its forest resources in rich and varied ways, which are still reflected in the present landscape.

Little information is available in official statistics—and in the present research as well—on a coppicing method that was widespread in the Italian landscape until the second postwar period, viz., pollarding, a sophisticated adaptation of trees to the requirements of farming and animal husbandry. Pollarded trees were often found in rows edging fields and in mixed cultivations, but the practice was also widely employed in woods. As late as the nineteenth century, pollarding, like limbing, was recognized as a normal coppicing method, employed to allow the grazing of animals in woods. In Tuscany, the Jacini investigation indicates that pollarded coppices were the third management form in extension, after "coppices for firewood and charcoal" and "for faggots and poles". Pollarding was done from 2 to 4 meters above the ground. It did not necessarily leave a single "head", since pollarded trees could have three or more. This form of "aerial" coppicing made sure that the young suckers were not eaten by grazing livestock, as would have happened with flush cutting. A variety of cutting techniques, tree species, and rotation lengths (from 3–4 to 20–30 years) were employed, depending on purpose. Pollarding was mainly carried out to produce forage leaves, but sometimes firewood as well. Beech, willow, poplar, hornbeam, ash, alder, maple and oak could all be pollarded. Apparently, there once were extensive landscapes of pollarded trees all over Italy, from north to south.[72] An important example of pollarding, with monumental pollard trees, is described in the text on the Bosco di Sant'Antonio in Abruzzo. Although those woods have historically being managed in such a way, it is doubtful that the practice will survive, since the wood is included in an integral reserve where any management practice is forbidden. Another much used system was limbing (*sgamollo*), where all the side branches were removed, leaving the trunk bare. The objective, again, was to favor the growth of leaf-forage. Both techniques are especially important in the Italian forest landscape, but have largely fallen into disuse[73] and are seldom recognized as worth preserving in forest management plans (Fig. 1.32).

1.5.1.4 Scrubland

Among the many existing forms of coppices, I would now like to dwell on those found in scrub woods. Once widespread all over the Italian peninsula, from the upper Po River Plain to Sicily, they were typically associated with grazing and agriculture. Examples are found in a number of the area descriptions in the catalogue. The category includes maquis, heathland, and other kinds of brush with various species.

[72] Di Berenger A. (1859–1863), *Dell'antica storia e giurisprudenza forestale in Italia, Longo,* Treviso-Venezia; Cevasco R., 2007, Memoria Verde, Nuovi Spazi per la Geografia, DIABASIS, Reggio Emilia.

[73] Cevasco R., Molinari C., 2009, Microanalysis in Woodland Historical Ecology: the example of leaf fodder production in the ligurian Apennins (Italy), in: Saratsi E., Buerghi M., Johann E., Kirby K., Moreno D., Watkins C., Woodland cultures in time and space, Embryo, Athens.

Fig. 1.32 Other types of wooded formations represented in the catalogue areas

A significant example are scrub woods of *Erica scoparia L.* and *Erica arborea L.* These are shrubs growing up to 6 m tall, occurring in many scrublands along with Calicotomes, Arbutus, broom, Cytisus, pistache, Phyllirea, and in the underbrush of cork, holm oak, oak and pine woods. In Italy, the two species are widespread in the center and south, even at altitudes above 1,000 m. They were most used and yielded the best quality products in Sicily (Monti Peloritani) both on the Tyrrhenian and Ionic versants, Calabria (lower Aspromonte and Tyrrhenian side), Campania (Cilento), Tuscany (Maremma and Valdichiana) and Sardinia.[74] *Erica* scrub was once more widespread than today. Its reduction was an effect of the end of the plants' usefulness to farms, the decline of the practice of land burning, the shrinking of pastures and their reforestation to improve them (since they were regarded as landscape-degrading features). These are evergreen species that thrive on acid and siliceous soils. Heath is xerophilous and "active pyrophytic", i.e., very inflammable. At the same time, fires favor its dissemination. After a fire, many new suckers grow out of the stump, and the bush soon regains its original size. Heath is often found on very degraded and arid soils, and can rapidly colonize areas otherwise unsuitable for tall vegetation, spontaneously covering bare hill slopes and thus protecting them from land sliding and water erosion. In Tuscany, heath occurs in mixed coenoses with *Calluna vulgaris*, *Avenella flexuosa*, *Cistus salvifolius* and *Arbutus unedo* in the coastal strip, where it constitutes one of the characteristic elements of the Mediterranean maquis, expanding inland from the coast to the chestnut areas on the Apennines. Foresters regard them as weeds because they compete with trees, limiting their growth and spread. The forest

[74] Magini E., 1957, Le Ericacee, Monti e Boschi, Numero Speciale, 11/12. 584–589.

inventory of Tuscany classifies them as a degradation of high forest. In Lombardy, scrub formed a characteristic moor landscape, uncultivated land colonized by the *brug*, the local name for *Calluna vulgaris H.*, a shrub of the heather family that formed extensive moors in the provinces of Varese and Como, and the northern province of Milan. Besides geological considerations, the persistence of these landscapes also depended on their utilization in agriculture. In Lombardy, as in many other regions in Italy, the moors were regarded as annexes of holdings in farming contracts. Actually, documents from various Italian regions, and notably from the account books of Tuscan farms, indicate that heath cultivation was quite widespread, and developed into a small forest industry resulting in a peculiar landscape. The heath had a remarkable variety of uses, and I think it is important to discuss them, because this is a typical case in which the revival of traditional uses of a plant could help to preserve vanishing landscapes.

To mention just the uses documented in Tuscany, both the epigeal and hypogeal parts of the plant were employed. The former yielded vineyard poles about 2 m long produced at cutting intervals of ca. 8–10 years, which lasted 14–18 years, longer than chestnut poles; faggots for bread ovens and brick furnaces; charcoal, often used in cellars to speed up wine fermentation; faggots used for building field drainage and sewage, notably for vineyard "sewers", to line the bottom of the pits in which the vines were planted; foliage for hut roofs, providing an effective protection from rain and heat, and preventing the nesting of mice and other parasites in homes; and brooms to sweep house floors, streets, etc., ever since the late fourteenth century. From the hypogeal part of the plant, instead, one obtained *ciocchi*, that is, wooden blocks from which pipe bowls were carved, and still are today. From the root of *Erica scoparia* one could make hard and dense blocks still used in the production of the Sicilian "white heath pipes" described by La Mantia.[75] Evidently, many of these products could still be useful today in farming as well as other activities, such as the heath brooms that are still used to sweep streets, stables, town squares and large open spaces in factories. In the 1970s, about 65 % of the national heath broom production was sold in Italy, mainly to the administrations of towns, where they were commonly employed for street sweeping. Each of the larger cities, like Rome, Milan and Naples, would order more than 200,000 brooms at the beginning of the year. In the regions of the north and center, the brooms were delivered preassembled, whereas in the south, and especially in Sicily, cleaned-up bundles were supplied from which the brooms were assembled on the site. Other outlets for brooms included the large industries and livestock farms of the Po River Plain. The waste from broom production was used to feed the furnaces of the steel works of Taranto, Bagnoli and Piombino. That same waste, along with other shrubs from the clearing of underbrush (broom, juniper, arbutus, etc.), was also employed in lime kilns. 35 % of the Italian heath broom

[75] La Mantia T., Giaimi G., Veca D.S. La Mela, Tomeo A., 2006, La scomparsa dell'utilizzazione dell'erica: un esempio di cancellazione di un paesaggio culturale e dei suoi valori naturalistici, in: Agnoletti M., Parrotta J., Johann E., editors, Cultural Heritage and sustainable forest management: the role of traditional knowledge, Proceedings of the IUFRO-MCPFE Conference 8–11, 2006, Florence, Italy. MCPFE, Warsawa, vol. 1, 58–66.

production was destined for the foreign market (Frances, Switzerland, Germany, Africa and the Middle East), where the quality of the product was much appreciated. Heath growing was never dealt with systematically in official silviculture texts, and the related know how is hence being lost.

1.5.1.5 Chestnut Orchards

Other wooded formations also would deserve separate treatment for their role in shaping the Italian landscape, such as coastal umbrella pine woods (*Stone pine*) or Alpine fir woods, but chestnut woods are especially significant. Chestnut groves (*Castanea sativa*) were long ranked as agricultural land, as they bore fruit and were hence regarded as different from regular woodland, only used for firewood and timber; a debate I do not want to enter in here, since it would force us to challenge the classification of all trees yielding fruit as well as wood, such as cork wood or domestic pine. Actually, what gave the chestnut tree its special place in the Italian landscape was it history and the range of products derived from it—from fruit providing nourishment for human beings and animals to timber and foliage—as well as its adaptability to different environments. Chestnut trees and chestnut groves can also be considered some of the best example of biocultural diversity at forest level. Discussing chestnut groves will also give me an opportunity here to briefly discuss the landscape value of monumental trees in the Italian landscape. While there is a widespread consensus in regarding the chestnut as an autochthonous Italian species, it is beyond doubt that chestnut cultivation spread from its area of origin in Armenia and Georgia westward to Greece and finally to Italy, whence it was disseminated to the rest of Western Europe.[76] The driving force beyond this last lap in the historical expansion of the chestnut—which followed the same route as the word, since the latter's origin is Indo-European—was Rome. The propagation of the chestnut in Europe went hand in hand with the advance of Roman cultural influence. Palaeobotanical studies have shown that in central Italy around 1000 B.C. chestnut pollen accounted for 8 % of the total tree pollen. This percentage increased dramatically during the expansion of the Roman empire, up to 48 % at the beginning of the Christian period. The chestnut is presently one of the species with the widest distribution in Italy. It is found in all the country's regions. It is found in Sicily and Sardinia, the Apennines, and the lower slopes of the Alps and Prealps, at altitudes ranging from sea level in central Italy and 1,500 m in Sicily. In 1954 it was estimated that of the 826,000 ha of chestnut groves in Italy, 446,000 were high stands and 293,000 coppices.[77] According to the latest national forest inventory (IFNC 2005), the total extension of chestnut groves in Italy today is about 788,406 with the minimum in Molise (390 ha) and the maximum in Tuscany (156,869 ha). This would make Italy the last European country for chestnut wood extension and chestnut production, but

[76] Pitte, 1986, Cit.

[77] De Philippis A., 1957–1958, Lezioni di Selvicoltura Speciale, Facoltà di Agraria, Firenze.

European statistics actually include abandoned chestnut groves that have reverted to mixed woods with a strong presence of chestnut. Actually, the analytical data in the first Italian forest inventory indicated that only 90,000 ha of chestnut groves were still cultivated for their fruit, with a reduction of about 80 % in just 30 years.[78] These figures thus point to a dramatic decline of a woodland of the greatest importance for the Italian landscape. Some regional statistics confirms this. According to the Tuscan forest inventory, in 1991 the total surface of woods with a prevalence of chestnut trees was 176,928 ha, but only 15,520 of these were actually still used for their fruit, 16,816 were abandoned, and the rest consisted of coppices, a small percentage of which was being converted into high stands.[79] The wooded surface where chestnut trees were merely "present", instead, amounted to 266,096 ha.

From Tuscany to Sicily, chestnut trees have always competed with olive trees, even at sea level. This depended on the needs of local populations. Determining what the optimal conditions for chestnut growing are is a whole other question. The great importance assigned to this species in mountain areas was due to its higher calorie yield per surface unit, and the fact that it could be grown in areas were grain could not. This is one of the reasons the chestnut was often referred to as the "bread tree". Its cultivation was associated with a series of manufacts such as drying stone huts for chestnuts and mills to produce chestnut flour. This elaborate production system, which also involved the use of the foliage as forage, was found over much of the Italian mountains, earning the nickname of "chestnut civilization". The variety of landscapes associated with chestnut groves is remarkable, since not only were they grown at a wide range of altitudes, but also on different land surfaces and in different densities. The trees were frequently grown on contour dry stone terraces (*lunette)* and even terraces supported by dry-stone walls on the steepest slopes. Densities ranged from 12 to 250 trees per hectare, and a variety of tree-spacing patterns were employed. For a long time, the economic value of chestnut groves was superior to that of high-stand woods. Only the increasing value of conifer timber eventually made them a more viable option. On Tuscan farms, the produce of chestnut trees was reckoned separately in accounts. Each holding was assigned a share so that no sharecropper would be deprived of this resource. Today many chestnut groves have been converted into coppices. These, as coppices in general do, provide very useful products to farms, but they are threatened, in different ways, by trends in progress, respectively, in rural areas and in protected ones. In the former, incentives to rural development plans for the improvement of chestnut groves have often resulted in the felling of monumental trees and the planting of new ones. As to protected areas, the risk, as some researches have shown, is that of the "renaturalization", i.e., a transition to mixed woods.

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[78] Ministero dell'Agricoltura e delle Foreste, 1988, Inventario Forestale Nazionale 1985, Trento.

[79] Regione Toscana, 1998, *L'inventario Forestale—Boschi e Macchie di Toscana,* Firenze.

1.5.1.6 Monumental Trees

The very low densities of chestnut groves and the presence of trees in agricultural areas have favored the historical persistence of specimens that have grown to a monumental size and appearance over the centuries. Such specimens have always drawn attention ever since remote times, especially for their size. Today, several Italian regions have drawn up inventories or public registries of monumental plants, and even published studies on the subject. Our research has not singled out individual plants, but some of the areas described in it include woods with monumental trees that are significant landscape features. They often occur in groups, or else a high number of remarkable specimens are found over a given area. Monumental trees have become rare in the forest landscape, because the management of woods for economic purposes have not favored their permanence, not only in Italy, but elsewhere in Europe as well. Considering their importance both in the Code of Cultural Heritage and in the present activities of the Italian Ministry of Agricultural, Food and Forest Policies, I think it will be useful to briefly illustrate their characteristics. Observing a monumental tree, it is easy to imagine the deep changes that occurred during its lifetime. Their longevity is one of the main reasons why many peoples regarded such trees are sacred. Today, their scarcity in the current landscape has drawn new attention to them. Very large trees are an extreme manifestation of resistance and adaptability, which are often indispensable conditions for their preservation over such a long time. Monumental trees are also appreciated for their "architectural" and landscape significance. Of course there are specimens in several countries in the world that reach remarkable sizes, such as sequoias in the United States and Baobabs in Africa. At our latitudes and in our cultural context normally there are no species with such characteristics, and the intensive anthropization of our country has not allowed many monumental specimens to survive. It is thus normal in Italy for very old trees to reach their age and size through human agency, as in the case of trees in formerly wooded pastures, woods used as pastures or, in any case, with low densities and hence allowing individual trees to grow and expand their foliage much more than in dense woods. We should also keep in mind that in forests some trees, such as the beech, can attain several centuries of age without growing to monumental sizes. A monumental tree, whether individual or part of a row or group, is an element that enhances our understanding of a landscape by reminding us of its past socioeconomic history. It helps to make a landscape unique in a context such as present-day Italy, where vast areas are characterized by uniformity and crop simplification. The felling of monumental trees is perceived in most cases almost as a loss for the historical, "architectural" and landscape value of a place. Unfortunately many centuries-old chestnut trees were felled over the years, not just to use their trunk or bark, but often just as a form of misguided "husbandry", where low-yield or diseased specimens were eliminated with little regard for their monumental appearance. Such operations, sometimes financed by public incentives to the rural sector, reflect a lack of cultural awareness and the need for norms that do not adopt productivity or health as the sole or principal criteria for the preservation of a plant. In some countries, like the

United Kingdom, monumental trees that are technically "dead on their feet" are still preserved only for their landscape value, as a historical testimony.

Sometimes a tree derives its monumental character from its botanical rarity, as in the case of trees growing in limited numbers outside their typical climate zone. Non-autochthonous species planted in the gardens and parks of villas and historical buildings may also be included in this category. Thus, the classification of a tree as "monumental" can depend on size—circumference and height—and age, or shape and appearance.[80] Environmental pressure and human action influence the morphology of a tree. Foliage can be shaped by prevalent winds, obstacles can cause a trunk to grow twisted or warped, and direct actions such as grafting and pruning give a tree its final shape. Monumental status depending on botanical rarity regards species that are not typical of the environment they grow in or that vegetate under extreme conditions. Architectural monumentality, instead, regards species that stand next to rural buildings, villas, or other buildings of high architecture-historical value, enhancing their aesthetic appeal. This last category is not described in the present catalogue, which mainly focuses on rural areas and woods. As regards historical-cultural monumentality, which is also well-represented in this catalogue, in this case the importance of a tree depends on local history. Such specimens also have an important aesthetical role when they stand in a highly scenic landscape or when they strongly characterize a spot by their presence. In this case, then, the value is not intrinsic to the tree, but arises from the context in which it is placed and its role in the local scenery. Sometimes what makes monumental trees remarkable is that they have been peculiarly shaped by traditional management techniques such as pollarding or limbing, or other coppicing practices. Indeed, sizable coppices can sometimes have a monumental character. Unfortunately, monumental trees in woods are normally left in a state of neglect. Even in protected areas, the vegetation is often allowed to follow its natural evolution, and this leads to the disappearance of monumental specimens, as in the case of chestnut groves. In the Moscheta area in Tuscany, as part of action taken to create a park of the rural landscape, management operations aimed at safeguarding many specimens in a monumental chestnut grove have indicated that they are highly vulnerable to modern forestry techniques and should be treated with special care.[81]

1.6 Typical Products

An important aspect of agricultural as well as wooded areas is the presence of typical products associated with a specific landscape. This is an aspect of strategic value for the active conservation and development of the rural landscape, as well as the promotion of the image and quality of Italian products abroad. The important role of typical products in policies aimed at promoting local resources is borne out by

[80] Grossoni P. Caramello R., 2005—*Alberi monumentali e significato di monumentalità.* Sherwood Foreste e Alberi oggi n.111, Compagnia delle foreste, Arezzo.

[81] Agnoletti, M., 2007, Il parco del paesaggio rurale appenninico di Moscheta, Pacini, Pisa.

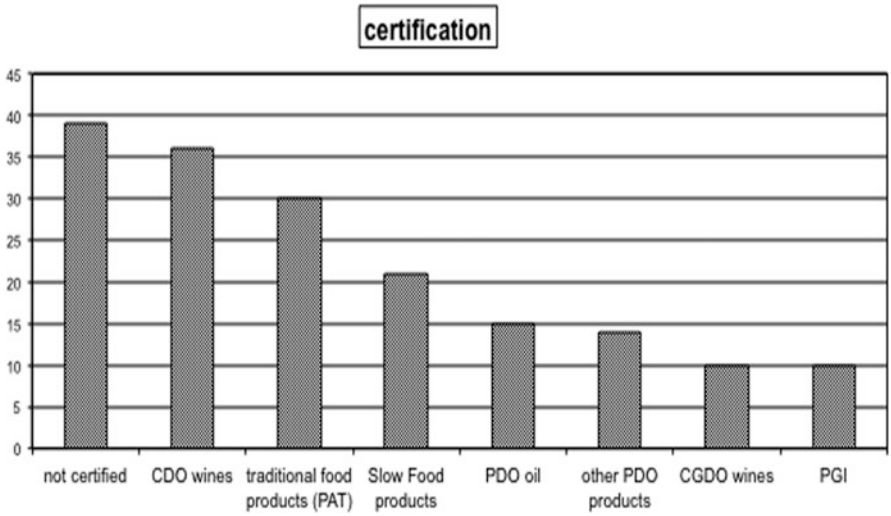

Fig. 1.33 The certification standards of typical products in the areas surveyed. The forms of certification available today do not ensure the connection between a typical product and a typical landscape

the many fairs and festivals dedicated to them, estimated at about 400 in the whole country only as regards fruit products. Festivals centered on the chestnut are especially numerous, bringing further evidence of the deep rooting of chestnut growing in Italian rural culture.[82] A vast literature exists on the subject of typical products, but at the same time their relationship with the landscape is usually overlooked. This is true not only of the various forms of certification of typicity, but also of the operations of important institutions. Slow Food has recently indicated biodiversity as adding value to the quality of a product. In its Atlas of Typical Products of Italian Parks, the Italian Ministry of the Environment refers to the relationship of these products with the landscape. However, as we shall see in the chapter on vulnerability, national parks do not always contribute to the preservation of traditional landscapes.[83] As we read in the chapter dedicated to strategic orientation in the document of the National Strategic Plan for Rural Development 2007–2013, the competitiveness of the agro-forestal sector can and must take advantage of the added value of the "landscape" resource as an element that part of our competitors cannot reproduce.[84] This will require measures promoting not just the preservation of landscape resources, but also a strong relationship between product quality and landscape quality. This should help to guarantee a profit and economic advantage to entrepreneurs who accept to give up productions, cultivations and behaviors not compatible with the conservation of the landscape resource. Such innovative polices, however, call for specific approaches and guidelines modifying past attitudes (Fig. 1.33).

[82] Fideghelli C., 2009, Le sagre della frutta, MIPAAF, Centro di Ricerca per la Frutticoltura, Roma.

[83] Slow Food, Lega Ambiente, Federparchi, 2002, Atlante dei Prodotti tipici dei Parchi Italiani, Slow Food editore, Cuneo.

[84] Agnoletti M., 2010, cit.

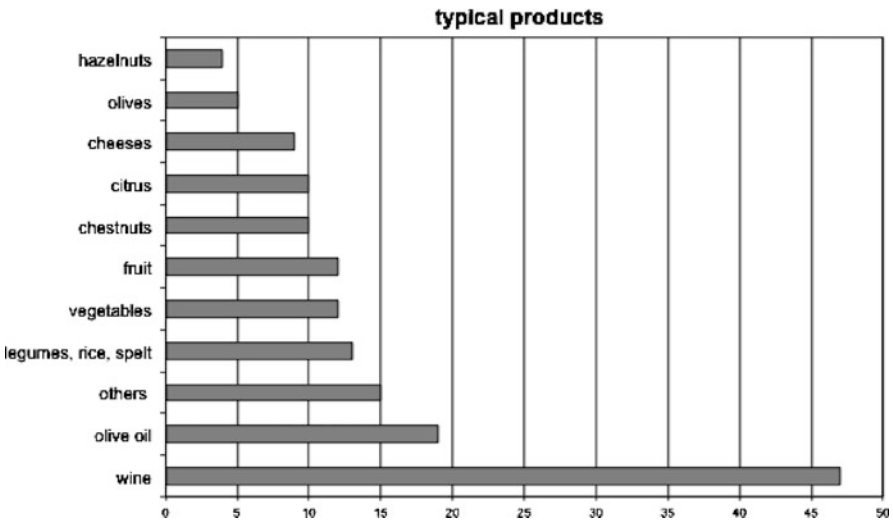

Fig. 1.34 List of typical products associated with landscapes

It is not simply by certifying the quality of the water, air, or soil, or biodiversity or biological production, that we can preserve a traditional landscape. These aspects only guarantee environmental quality—often improperly merged with the concept of landscape—and food security.

As the graph on typical products shows, wine is certainly the first product among those mentioned in the area descriptions, followed by oil (Fig. 1.34). If we associate a specific wine with certain landscape elements such as terracing or mixed cultivation, it will become apparent that the laying out of large vineyards *a rittochino* (slopewise), doing away with terraces, or of 100 of hectares of pure vineyards in areas historically characterized by polyculture do not help to safeguard the uniqueness of a landscape and the value it adds to its typical products. These systems do help to cut production costs—although many wine-growing areas in Italy and elsewhere in Europe are still terraced—but with collateral effects that should be taken into account.

Italians are often blind to something that is perfectly evident to buyers of Italian products abroad, or sellers striving to market those same products by promoting the image of Italy. This is also and especially true of sectors that should be the first to see where their advantage lies. The sites of many Italian producers and consortiums in more or less famous production areas are brimming with images of the production areas, but lack information on how the preservation of landscape resources is ensured. Fortunately, something is changing, partly thanks to new orientations in agricultural policies and the initiative of some entrepreneurs who have realized that we are rapidly moving towards a concept of "integral quality" where the product and the landscape are joined together, promoting the "competitive identity" of an area that otherwise would end up sharing the same features as others and losing its uniqueness. The many

wine routes that have sprung up all over Italy, but also in many other countries, often associate wine-growing areas that are often different from each other only in their geomorphological and settlement aspects, such as the presence of historical burghs or typical farmhouses, of hill or mountain habitats, but where the traditional features of the agricultural mosaic have disappeared and the vineyards all employ the same productive processes and planting techniques. The *terroir* question often becomes a mere matter of soil or climate, with no connection to the landscape, and the planning of wine-growing landscapes seldom considers the question of landscape quality and cultivation layouts.[85]

In some of the areas in the catalogue, successful conservation and restoration of terraces has been undertaken, yielding quality products such as wine, hazelnuts, fruit and vegetables. Some of these cultivations also have a remarkable scenic impact, such as the world-famous citrus terraces of the Amalfi coast, the "stone landscapes" of the island of Pantelleria, or the much less known rock-cut olive groves of Vallecorsa in Latium, which would certainly deserve inclusion among UNESCO landscapes, like many other areas documented in our catalogue. It is noteworthy that typical products are more frequently associated with agricultural areas, much less often with wooded ones. If we look at the wooded areas in the catalogue, we will observe, for example, that cheeses and chestnuts, as well as mushrooms, game and truffles, as well as non-edible but equally typical products such as cork wood, are associated with woods. The case of cheese is especially interesting. While the connection between a wine and a specific form of terracing or mixed cultivation can be easily grasped, that between a cheese and a wooded area with bare or wooded pastures is less obvious. Actually, the over 400 Italian cheeses catalogued by the Institute of Rural Sociology in Rome[86] are often closely tied to historical landscapes where free-roaming dairy animals graze in areas where the presence of woods contributes to the typicality and quality of the product, also from the standpoint of food security.

One will remark that many of the products in the catalogued areas have yet to be included in any of the existing certification systems, but even these do not appear capable of ensuring landscape preservation. It was hence an especially timely initiative on the part of the Italian Ministry of Agricultural, Food and Forest Policies to begin a study for the creation of a new certification model guaranteeing the connection between typical products and landscapes and thus rewarding farmers who strive to preserve the landscape at the price of higher production costs.

1.7 Integrity

Assessing integrity is essential if we wish to understand the state of our landscape heritage and its potential as a resource. It is a necessary step in the drawing up of conservation and valorization policies to stimulate local development and

[85] Tesi P.C., Vallerini L., Zangheri L., 2009, Vino e Paesaggio. Materiali per il governo del territorio, Associazione Nazionale Città del Vino, Castelnuovo Berardenga.

[86] INSOR, 1991, Atlante dei prodotti tipici: i formaggi, Franco Angeli, Milano.

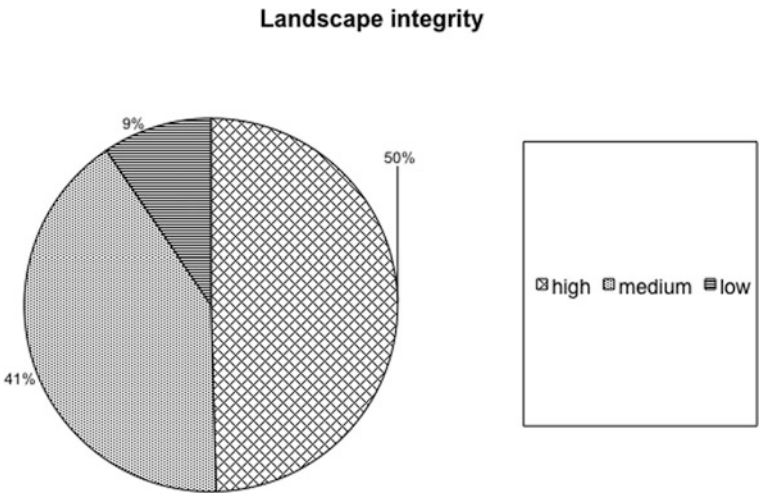

Fig. 1.35 Levels of integrity of the catalogued landscapes

promote the "landscape dimension", which is the frontier of modern rural development approaches. However, in our investigation evaluating integrity turned out to be the most difficult task we had to face. The conditions to be met for a heritage site to be regarded as endowed with authenticity and integrity are detailed in an article in the UNESCO World Heritage Convention.[87] Many different parameters could apply, and these may differ from culture to culture, and even within the same culture. That is why article 81 of the convention prescribes that the value of cultural heritage should be mainly assessed within its cultural context. The conditions for authenticity are regarded as met if the cultural values of the site are expressed in a range of features such as shape, design, material, use and function, tradition, techniques, management, location, and environment. The same features can also be found in a historical farming landscape with its crops. Article 88 defines integrity as the measure of how "intact" a cultural asset is. In practice, it is a matter of determining in what measure it:

- includes all the elements required for its value to be expressed;
- has an extension adequate to fully represent the characteristics and processes expressing its significance;
- is affected negatively by development and/or abandonment (Fig. 1.35).

For this first investigation on the state of Italy's rural landscape heritage, we focused on crop management, without going into a detailed examination of settlement. Hence, we mainly gauged integrity in terms of the extension of the areas under scrutiny and the conservation of the historical features of cultivations. As regards the former aspect, our original instructions to our investigators was to single out areas with extensions between 500 and 2,000 ha. The choice of this spatial scale was determined by several considerations. In the first place, it would allow the inclusion

[87] UNESCO WHC, 2008, Operational Guidelines for the Implementation of the World Heritage Convention, WHC 08/01, January.

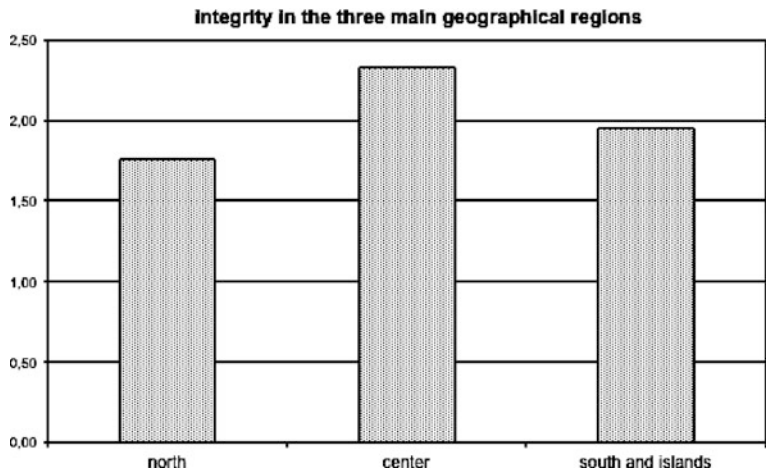

Fig. 1.36 Landscape integrity in Italy's three main geographical regions

of several management units—holdings, farms, large estates, etc.—in a single area. This would shed light not only on changes in farm management and the possible connections between the landscape and types of rural contracts such as sharecropping or those applied on latifundia, but also on the relationship with the environment. This choice of area size would also facilitate studies of the relationships between the various patches making up landscape mosaics from a landscape ecology perspective, and allow monitoring by remote sensing and ground checks to assess ongoing dynamics and the results of valorization actions. These objectives may appear to have called for larger area sizes, but experimental data from areas in Tuscany with extensions of ca. 1,000 ha had proved this average size to be quite adequate.[88] Another element that later turned out to be decisive, and suggested a certain degree of flexibility in minimum surface requirements, was the awareness that, in all probability, setting inflexible criteria for the singling out of perfectly preserved historical cultivations would bring us up against a scarcity of extensive areas with such characteristics. This problem will be further explored in a specific case study presented in this book, however, the collected data confirmed the problem we had anticipated. We were confronted with a myriad of areas that had preserved their historical characteristics, but over small and fragmented surfaces. Furthermore, historical cultivations were rarely contiguous within a given area. This forced us to modify our initial parameters, extending them to include areas with smaller surfaces—e.g., 100 ha or with historical cultivations scattered over broader surfaces. Another important consideration, especially as regards the statistics provided in the present chapter, is the subjectivity of the data gathered by individual researchers on the actual state of preservation of the historical features of cultivations (Fig. 1.36).

[88] The system was applied to 14 selected study areas in Tuscany. For some of the results, see Agnoletti M., ed., 2002: Il paesaggio agro-forestale toscano, strumenti per l'analisi la gestione e la conservazione, ARSIA, Firenze.

In general, our researchers estimated integrity on the basis of the survival of cultivations described in historical literature about the area. For example, they regarded the preservation of a terraced vineyard as a sufficient condition for a positive assessment of integrity, even though grape-growing techniques might have changed over time. On the contrary, poor preservation of dry-stone walls or the colonization of terraces by shrub and arboreal vegetation had a negative impact on the assessment of integrity. Likewise, the survival of a historical pinewood was regarded as a sufficient condition for inclusion in the catalogue, even though its colonization by a high number of other tree species due to the lack of maintenance actions aimed at preserving its monospecificity had had a negative impact on its integrity.

We interpreted the gathered data on the basis of the contents of the area descriptions themselves, not on qualitative or quantitative statistical data, as one can see in the first graph showing the degree of integrity of the recorded areas. Another graph highlights the different degree of integrity of the landscapes in the main Italian geographical regions. Central Italy appears to show a higher degree of integrity, followed by the south and the islands, and then by the north. Aside from the subjectivity of descriptions, there is undoubtedly a remarkable difference between the condition of landscapes in the Po River Plain and in the rest of Italy. In the Po River Plain, the selected areas often owe their significance to the survival of traditional constructions, distinctive field layouts, or localized cultivations. But while these elements, the main focus of the area description, are still intact, historical integrity is low in the rest of the area's landscape. This confirms that the remarkable expansion of agriculture in this part of Italy has deeply undermined the historical character of the landscape, as many authors have stressed with regard to phenomena such as the disappearance of the *piantata padana*, the local mixed cultivation system.[89] There are, however, important exceptions to this geographical trend. In Trentino Alto Adige and Friuli there are still some landscapes with high integrity, even compared to their analogues in the central and southern regions. This datum, however, was certainly influenced not only by the subjectivity of the investigators, but also by the lower number of recorded areas: just 4 in Trentino Aldo Adige, but rather intact, vs. eight in Piemonte, but with a lower degree of integrity. In central and southern Italy, historical landscapes are usually in better condition. Especially in the south, this confirms the potential of a resource which, if integrated into the typical product market and the growingly popular rural tourism, could certainly offer interesting opportunities for economic development, as long as the characteristics that make up these landscapes' integrity and uniqueness are given adequate recognition. Unique and intact landscapes of great interest are actually more frequent in the south and the islands than in regions with well-established and widely recognized landscape values, such as Tuscany and Umbria. Examples include the carob groves in the province of Ragusa, or the terraced almond orchards of the Gargano in Puglia.

[89] Cazzola F. (2008): Foreste di pianura: espansione e declino della piantata padana (sec. XV–XX), in V. Marinai (ed.), Paesaggio e sostenibilità. Studi e progetti. ETS, Pisa; Gambi L., (1995): Declino o evoluzione della tradizionale piantata in coltura promiscua?Qualche considerazione ricavata dal caso emiliano-romagnolo, in R. Ceschi e G. Vigo, a cura di, tra Lombardia e Ticino, Studi in memoria di Bruno Caizzi, Edizioni Csagrande SA, Bellinzona.

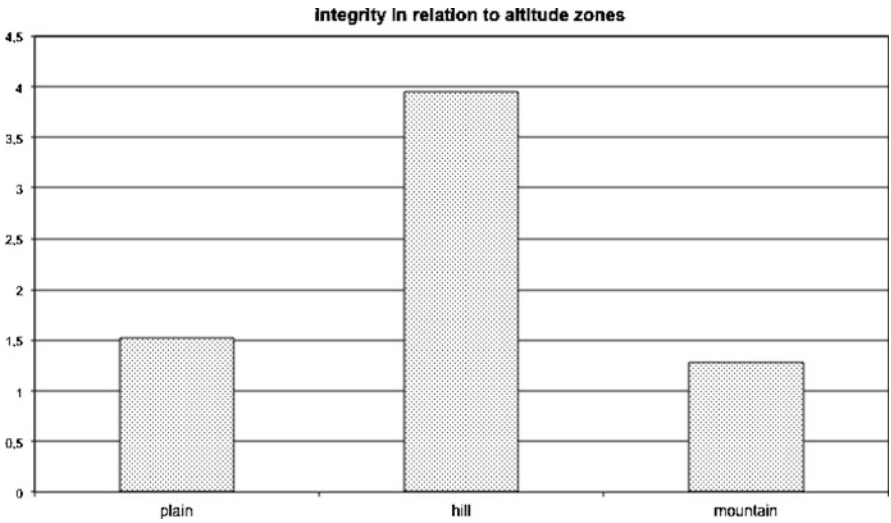

Fig. 1.37 Data showing the relationship between integrity and altitude indicate a higher number of intact landscapes in hill zones. These areas were able better resist to abandonment and industrialization

Another aspect of the gathered data is the distribution of integrity by altitude. If we compare areas in mountains, hills and plains, there is a clear-cut prevalence of hill areas, which also have the most intact landscapes. This depends on two opposite processes that we will be discussing more in depth in the chapter of vulnerability. In the plains, there was a higher intensification of productive processes. Here mechanization and modern industrial agriculture had destructive effects on the historical landscape. On the contrary, in the mountains the abandonment of agriculture and animal husbandry, followed by the exodus of the population and increasing economic marginalization, led to a gradual deterioration of the integrity of the rural landscape, which today is largely being undermined by processes or renaturalization. In hilly areas, instead, due to the difficulty of establishing vast highly mechanized industrial monocultures and the reduced importance of abandonment, most of the land remained in the hands of small landowners. Besides, hills account for most of the Italian surface. For both reasons, most historical landscapes in good condition are in the hills.

Another element that our area descriptions often present as connected with integrity are local landscape restrictions and norms. As we will explain more in detail in the chapter on vulnerability, the conservation of the historical rural landscape seems to depend much more on the continuity of traditional practices than on landscape restrictions or protected areas, which actually appear to be in the process of deteriorating. Examples such as the historical pinewoods of Ravenna, which shows low integrity in spite of being under several kinds of legislative protection, indicate a certain inadequacy of presently available legislative instruments. That is why we did not regard the simple fact that one of the selected areas lay within a zone placed under landscape, naturalistic or hydrogeological restrictions as a sufficient condition for assuming the integrity of its historical landscape (Fig. 1.37).

1.8 Vulnerability

As described in the chapter on integrity, the need to assess vulnerability is already affirmed in the UNESCO World Heritage Convention. Vulnerability studies are also commonly carried out as a part of nature conservation actions and environmental impact analyses.[90] As specifically regards our research, it was absolutely necessary to identify threats to the conservation of the selected landscape resources to allow the establishing of guidelines for action and a hierarchy of urgency among sites. Each landscape has an "intrinsic" vulnerability depending on the various types of processes that can affect it. For example, a dry-stone terrace is extremely vulnerable to abandonment, as the absence of maintenance will lead to the collapse of the terrace and erosive phenomena, including major ones such as landslides, within very few years, as we also discussed for Cinque Terre. On the contrary, an adult beech wood is relatively much less vulnerable, even if no longer managed. In this perspective, a classification of transformations in land and, hence, landscape uses as related to hydrogeological risk would be extremely useful as a means to monitor and prevent events such as landslides and floods, which in Italy mainly depend on erosion. The presence of erosive phenomena among the causes of vulnerability in the recorded areas bears witness to the destructive effects of processes depending largely on the abandonment of land-shaping and hydraulic works (Fig. 1.38).

Our data clearly show that the main threat to the Italian rural landscape is abandonment. This is hardly surprising, considering what was said above regarding the transformation and reduction of agricultural surfaces. As we said abandonment of farmed land advances at about 120,000 ha per year, in this data we must include also the abandonment of historical landscapes, often the most fragile, also considering their reduced economic importance, leading to a faster abandonment compared to the most specialized agricultural areas. The increase in forest land, about 70,000 per year, including burned forest areas, marks the speed of a process leading to the complete loss of the previous landscape. The process of abandonment and reforestation is mostly concentrated in the mountains and the high hills, while on the plains urbanization is the most important phenomena. There is no way to calculate urbanization since the Unity of Italy, however in the last 10 years urbanization is advancing at a speed of 16,000 ha every year according to ISTAT[91], although Corine shows a different figure and other independent studies shows a rate of about 8,000 ha per year, mostly concentrated around cities[92].

Abandonment also impacts historical woods in terms of modifications of their density, structure and species composition. For example, the introduction of other tree species following the abandonment of management will turn a chestnut grove or domestic pine woods into a mixed woods, changing the specific composition of woods originally designed to be monospecific. Other major phenomena influencing

[90] Romani V. (1994): Il Paesaggio. Teoria e pianificazione; Franco Angeli, Milano.

[91] Istituto Nazionale di Statistica, 2012, Rapporto Annuale 2012. La situazione del paese, Roma.

[92] Di Gennaro A., et al., *Come è cambiato il nostro territorio. Dinamiche di uso del suolo nei paesaggi italiani tra il 1990 ed il 2006.* Territori, n. 3, maggio 2011.

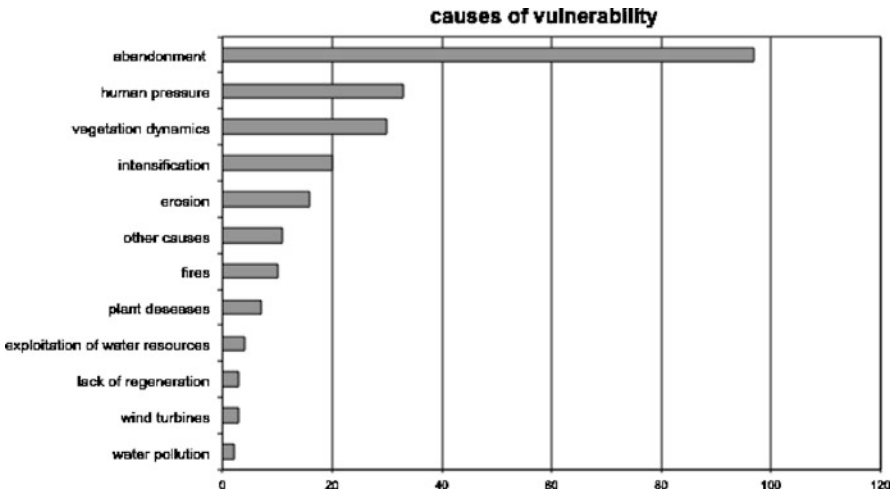

Fig. 1.38 Main vulnerability phenomena in the examined areas

vulnerability are human pressure and the intensification of agriculture. The former is often a consequence of urban expansion, especially in metropolitan areas, a typical case being the urbanization of the countryside around Naples and Milan. In this case, the conservation of the agricultural landscape, whether historical or not and independently of its quality, has the important function of limiting building expansion. The areas in the countryside of Naples are in a situation of great vulnerability that is undermining their integrity and historical character. Intensification, instead, is a result of the industrialization of agriculture following a development model invariably based on mechanization and crop reorganization to increase yields and cut labor costs. This is an approach dictated by a vision of rural development that regards modernization of the productive infrastructure as the principal objective, and relegates to the background landscape quality and resource diversification. The validity of this model, however, has been challenged by the globalization of markets and the loss of the economic relevance of industrial agriculture, which is giving way to a farming economy based on new relationships between typical products, rural tourism, landscape, and other functions performed by the countryside for society as a whole (Fig. 1.39).

Data on vulnerability caused by wind turbines deserve special comment, since this subject is currently very much in the public eye in Italy. Besides the fact that wind towers produce an insignificant amount of energy not only compared to the needs of the country, but also compared to the nominal power installed, we have to observe that the impact on the landscape has little value. Even in regions like Tuscany, the idea of developing a law regulating them according to environmental impact assessment guidelines has not been approved by the regional government[93].

[93] The author has produced the guidelines for the landscape impact assessment of wind towers for the regional government of Tuscany.

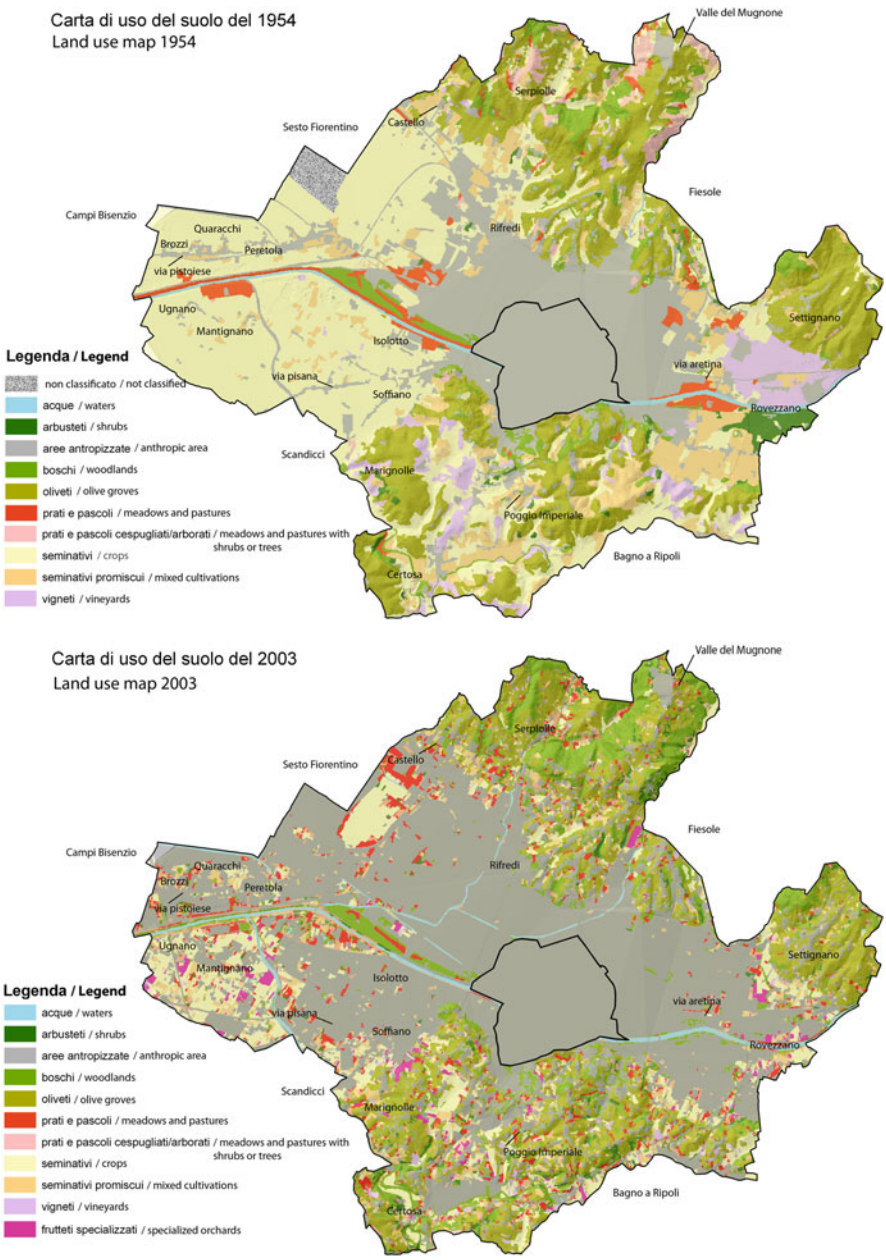

Fig. 1.39 Human pressure and expansion of urbanized areas are important causes of vulnerability around the big cities. The maps show that the urban area of Florence, from 1954 to 2002, more than doubled its extension, reducing the farmed land around the city

Present advocates of the development of renewable energy sources in Italy often seem to forget that the contribution of our cultural heritage to the progress of humanity, the economy, and people's quality of life is much more significant than any contribution our wind turbines may give to the solution of the energy problem and the mitigation of global warming. Therefore, although we do need to find a solution to our energy problems, the ambitious wind-turbine projects implemented by regions with vast landscape assets should not limit their costs-benefit analyses to theoretical estimates—invariably presented as "facts"—of the tons of CO_2 saved from being released into the atmosphere, or the energy production of the turbines—nominal, but also presented as a "fact"–; these analyses should also take into account the impact of wind turbines on landscapes. Most of the studies promoting wind as well as photovoltaic power plants overlooked the issue of their landscape impact,[94] just as the landscape played a very limited role. Even in regions showing a higher regard than others for landscape values, today there is an extreme reluctance to implement norms taking adequate account of the visual impact of wind turbines, whose height makes them conspicuous over vast land tracts.

1.8.1 Landscape Restrictions and Protected Areas

Data on the impact of abandonment and vegetation dynamics in abandoned areas gain special significance when crossed with those on legal protection. Among the areas in our register, a high percentage lies in parks or Sites of Community Importance (60 %) (Fig. 1.40). Of these, 51 % lie within SCIs of the Natura 2000 network and 37 % in parks or reservations. Besides, 64 % are under landscape restrictions under Acts 1497 of 1939 and 431 of 1985.

If we look at vulnerability statistics in areas under landscape restrictions, we will realize that the existing ordinary legislation cannot guarantee the conservation of historical rural landscapes. In fact, in protected areas the trend is often, explicitly or implicitly, to favor renaturalization. Protected areas should ensure landscape conservation. However, the statistics presented here are perfectly in accordance with present policy orientations in nature conservation at the European and national level. According to these orientations, the habitats especially deserving of protection are natural ones, and animal and plant species not connected to agricultural activities. In fact, natural habitat protection theory regards their fragmentation as something negative, which conservation policies strive to prevent. This obviously clashes with the manmade origin of the Italian landscape and its very fragmented landscape mosaics characterized by a multiplicity of land uses. In substance, the most commonly accepted interpretation of biodiversity favors the spread of natural vegetation over previously cultivated areas. As regards historical forest landscapes, management plans tend to encourage the transformation of chestnut groves or pine woods into mixed

[94] Martin J. Pasqualetti, Paul Gipe, Robert W. Righter (2002): Wind Power in View: Energy Landscapes in a Crowded World; Academic Press, USA.

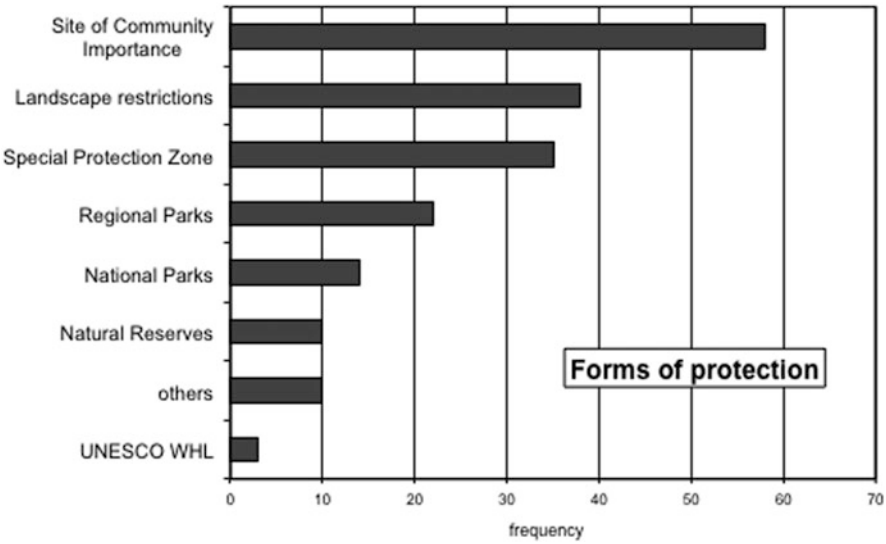

Fig. 1.40 More than 60 % of the areas lie within protected zones of some kind, and 34 % are under landscape restrictions. These forms of protection, however, have proved ineffective to counter deterioration consequent on abandonment, insofar as they were conceived for other purposes

woods, because the latter are closer to the natural state. As Diego Moreno and Roberta Cevasco explain in their chpater, there is a biodiversity associated with history that is rarely taken into account. More in general, the scientific theory of biodiversity, at the species and ecosystem level, could be well integrated into the landscape dimension,[95] which is a fundamental interpretive key for the Mediterranean area. The fact is, however, that norms and applicative directives concerning sustainable management, especially in the forestry sector, are clearly not taking into account this level;[96] nor does the European Habitat Directive of 1992 leave doubt as to which habitats should be protected and which risks avoided, such as fragmentation, a typical feature of many traditional landscape mosaics. There is thus a problem in the interpretation of the concept of the protection of nature in the Mediterranean area and its relationship with the landscape, a problem that calls for reflection. It should be finally clarified that the continuous increase of forest, creating dense homogeneous forest covers on large portion of land is not the "ideal landscape", especially for Italy (Fig. 1.41).

An important observation regarding the frequency of occurrence of historical landscapes in protected areas is that, considering the remarkable increase of the

[95] Baudry, J. and F. Baudry-Burel (1982): La mesure de la diversité spatiale. Relation avec la diversité spécifique. Utilisation dans les évaluations d'Impact. *Acta Ecologica, Oecol. Applic.* 3, 177–190; Naveh Z., Culture and landscape conservation: A landscape-ecological perspective. In: B.Gopal et al. (ed.) (1998): *Ecology today: An anthology of contemporary ecological research.* International Scientific Publications, New Dehli, pp. 19–48.

[96] MCPFE, 2003: Improved Pan European Indicators for Sustainable Forest Management, MCPFE Liaison Unit, Vienna.

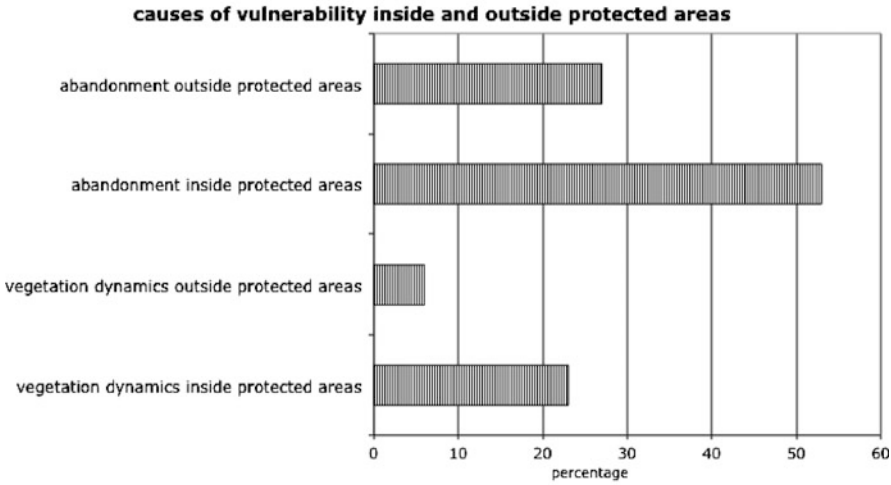

Fig. 1.41 Vulnerability due to abandonment and reforestation in the catalogue areas lying within and outside protected areas

latter over the last few years, it was easy to foresee that they would be established in economically more marginal zones. These, however, are also those where the most interesting historical landscapes, even from a merely aesthetic standpoint, are often found. It is thus evident that there is a problem regarding the relationship between the preservation of the rural landscape and protected area management which will have to be dealt with somehow (Fig. 1.42).

Different considerations apply to landscape restrictions included into the Code for Cultural Heritage enhanced by the Italian Ministry of Culture. These should be theoretically more adequate for the preservation of the rural landscape; however, they have so far failed to achieve this end. In fact, the statistics for our areas indicates that in those under landscape restrictions the threat of abandonment is even higher (81 %) than in protected areas, and so is the threat from encroaching vegetation (83 %). This depends in part on the nature of the restrictions imposed by the 1939 act, which aimed at preserving assets such as parks, gardens, work of art, landscape views regarded as "natural pictures", panoramic viewing spots or belvederes, but not the agricultural landscape. As to the Galasso Decree of 1985, while it introduced the category of "environmental assets" among those eligible for protection, including features such as mountain peaks, coasts, rivers, lakes, wooded areas, etc., it did not take the rural landscape as such into consideration.[97] Thus, in spite of the important work conducted by several generations of researchers on the Italian agricultural landscape, while natural features were included long ago among categories eligible for protection, agricultural features, which still make up most of the Italian landscape by far, are still excluded from them. Actually, restrictions on protected areas and landscape laws appear more effective against phenomena such as the expansion of urban areas,

[97] Santoloci M. (2000): Diritto dell'Ambiente; Edizioni Ambiente, Milano, 2000.

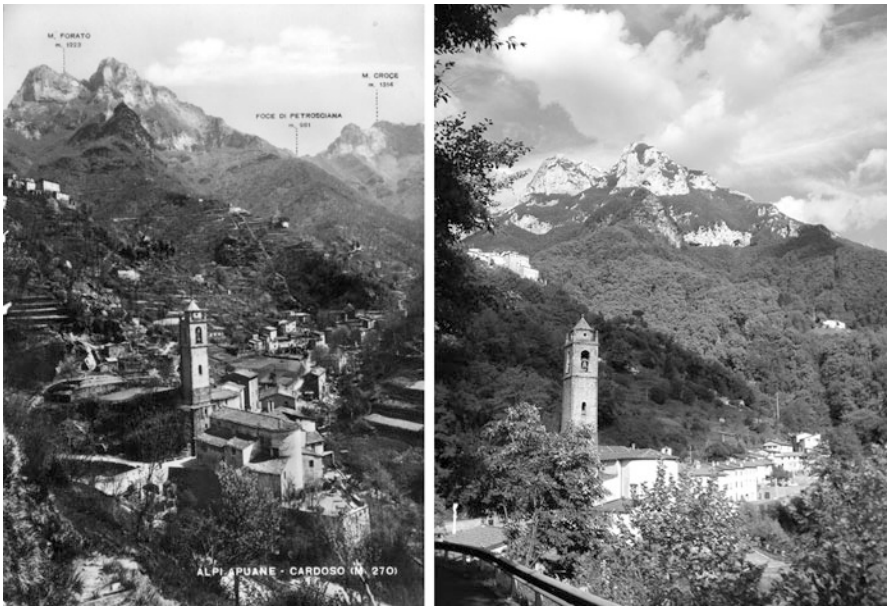

Fig. 1.42 Photos of the village of Cardoso, in the same area shown in Fig. 1.3. The photo on the left has been take in 1900, the one on the right in the year 2004. The increase of woodlands over the terraced slopes is interpreted as a positive result of renaturalization, also increasing biodiversity, by the Apuane Park were the village is located. In fact, the biodiversity, both at landscape and species level, associated with the previous historical landscape has been degraded. An act issued in 2012 allows the removal of forest to restore a landscape of historical importance

or in limiting the transformation of agricultural into urban land, but are inadequate as a means to prevent the loss of rural formations of special value (Fig. 1.43).

The dynamic nature of the agricultural and forest landscape inevitably causes it to change, independently of human action. Thus, in the absence of specific legislation not only recognizing the origin and significance of cultivations, but also exerting an active influence on their transformation processes and, hence, on farmers, little will be achieved. As we have seen, over recent years there was a further merging of the two approaches, the traditional aesthetic-cultural one drawing on the same inspiration as the act of 1939, and nature conservation, according to the widespread idea, supported by most of the scientific literature, that a "return to nature" is not also good for sustainable development, but also for landscape. In a way, landscape restriction legislation tends to adopt "naturalistic" values wholesale, without taking into consideration the real object of conservation, which is the result of the historical integration between man and nature. Thus, the restoration of a historical agricultural landscape by removing the woodland presently occupying it, is a violation both of landscape restrictions and of forest laws. The abandonment of a centuries-old pasture or terrace and its occupation by spontaneous vegetation, instead, is not regarded as such. The problem of restoring a historical landscape has been finally solved by a

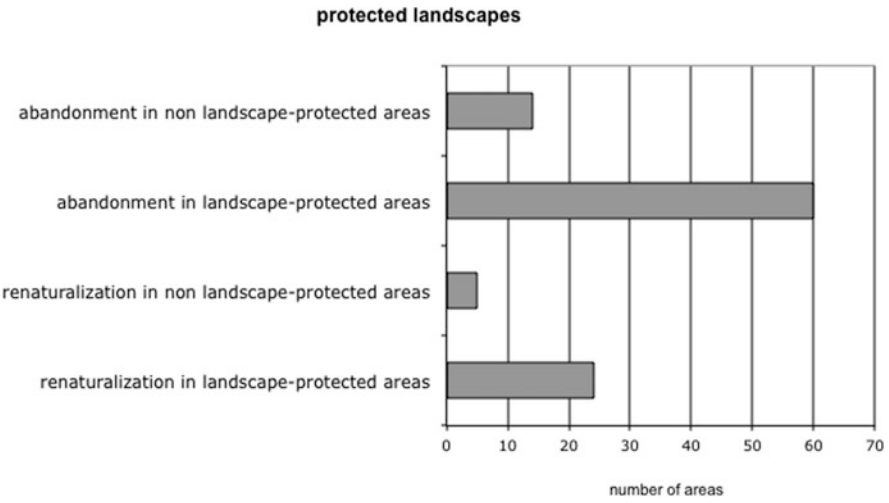

Fig. 1.43 The progression of abandonment and renaturalization in areas under landscape restriction compared to areas that are not. Although landscape restrictions were meant to save the Italian cultural heritage associated to landscape, they have rather protected an idea of nature that has little to do with it. It is an interesting cultural phenomenon connected to the idea that the renaturalization of the rural landscape is going to improve its quality

recent modification introduced to the existing law, stating that the removal of a forest for the restoration of a historical landscape is possible and legal.

Our register includes several examples, such as the mentioned historical umbrella pine woods of Ravenna, an area under many environmental and landscape restrictions where extensive vegetation dynamics are deeply compromising local historical characteristics and no action is being taken to prevent this. An example of the view expressed by the current nature conservation strategies can be found in Tuscany. Among the habitats under priority protection under the European HABITAT Directive of 1992 we find "mixed chestnut-dominated woods", which are nothing but the result of the abandonment of chestnut orchards. Technically speaking, declaring such a habitat a Site of Community Interest and placing it under landscape restrictions would make action to restore the original chestnut orchards—the true habitat at risk of extinction—a violation of EC norms.

Another interesting consequence of the increase of forest is the fact that the 1939 act protected panoramic viewpoints as essential elements for the development of landscape tourism, whereas today many hill and mountain roads with great scenic potential run inside forests that actually preclude the view of the surrounding landscape. Although this is a widespread phenomenon, rarely is action taken to remove the vegetation obstructing the view of the landscape to create truly panoramic routes, partly because this would involve violating laws. It is clear that the issues I have been discussing here concern to the highest degree both the existing legislation on natural and landscape conservation and the subjects involved. The "Code for Cultural and

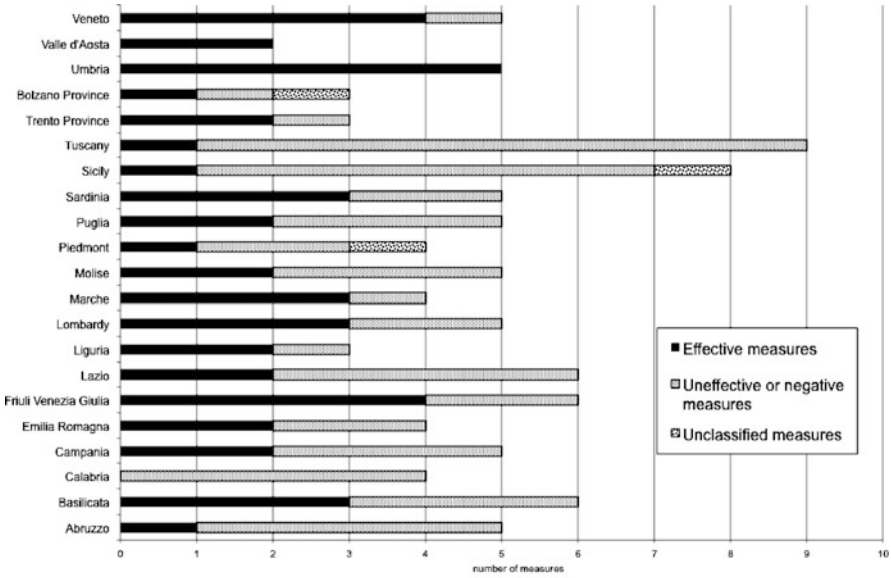

Fig. 1.44 Graphs showing the quality of the measures developed for landscape by the Italian regions, after the introduction of this objective in the national plan for rural development. The contradictory results of this assessment, made by the landscape working group of the Ministry of Agriculture, Food and Forestry, are mainly due to a misleading interpretation of landscape conservation, often confused with nature conservation or environmental conservation. Accordingly, in many technical documents the term "landscape" is often used interchangeably with "land" or "environment"

Landscape Assets" will be able to improve the situation. Article 142, comma 3, rules that the State, Regions and Autonomous Provinces can single out historical rural landscape systems to be placed under specific protection for their exceptional integration of the rural landscape and traditional agronomic practices. The purpose of this protection should be to promote their conservation and sustainable development and prevent the deterioration of their land. This article thus offers the Italian regional governments the opportunity to indicate landscapes to be safeguarded, especially through their landscape plans. It still remains to be determined what criteria will be adopted to identify such landscapes, considering that in regions where landscape plans are already under way one finds interpretations that give rise to perplexities, such as whether a correct distinction was formulated between "historical" and "natural" landscapes. Besides, the Code provides no indication as to how landscape plans, or at least conservation activities, should integrate with rural development programs, which may promote activities that are at odds with landscape protection (Fig. 1.44).

Chapter 2
Assessing the Integrity of the Historical Landscapes

Three Case Studies in Some Terraced Areas

Mauro Agnoletti, Antonio Santoro and Lorenzo Gardin

2.1 Introduction

Considering the importance of terraced cultivation for economic in the areas surveyed by this research, it has been decided to develop an investigation in order to analyse their features and assess the historical integrity of some areas considered as having a high level of integrity. The study is useful also in view of the funds available for the restoration of terracing according to the Common Agricultural Policy and the initiatives taken by the Ministry of Agriculture Food and Forestry, but also for the establishment of the national register of traditional landscapes. The latter will require a definition of the level of integrity in order to include the selected areas in the register. In this research three case studies were identified, Lamole, Valdobbiadene and Costa Viola, located respectively in the north, the center and the south of Italy, choosing an extension of about 800–1,000 ha for each one of them. For each area a methodology defined "Historical Cultural Evaluation Approach" was applied, already developed as part of a project for the monitoring of the Tuscan landscape (Agnoletti 2002, 2006). The project for Tuscany considered three dates starting from the early nineteenth century, but in our case, to simplify the analysis we adopted as a starting point the landscape in the 1950s. The aerial photos taken in this period represent Italy before the industrialization of agriculture, allowing us to understand the traditional features of the agricultural landscape and make a comparison with recent aerial photos representing the situation after industrialization.

The 1954 photos were digitalized and imported into a GIS together with the other available information and georeferenced on the basis of the orthophotos of

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2007. The images on the two dates, despite the different resolutions and the effect of distortion on the photos of 1954, resulted as being sufficiently coincident, with the conspicuous points selected on the aerial photos (historical buildings, roads, trigonometric points, etc.) on the two dates having an entirely acceptable mean error of 5 m, which facilitated the operations of retrieval and topological overlay. The first step for each sample area was the photo-interpretation of the aerial photos of 1954 and of the orthophotos of 2007, aimed at identifying types of land use and terraces. Terraces have been digitalized only for one area. While the resolution of the 2007 orthophotos was suitable for the purpose, the same cannot be said for the aerial photos of 1954, which, having been taken at a higher altitude and being generally of lower quality, did not always provide the required level of detail. The simplification and pooling of some classes utilized in the land use map therefore became necessary to be able to do the overlays for the definition of the evolutionary dynamics. In addition, it was not always possible to distinguish all the types and their level of density, for example between arable crops and mowed meadows in 1954, or between sparse and degraded woodlands, therefore shrub-like, and true scrublands. The result of the digitalization of the land use on the two dates was checked against the topology to eliminate possible overlapping micro-areas, and zones having both an area major of 10 m^2. In order to precisely characterize a terraced landscape and identify some of its parameters that may be reproduced and compared in other geographical contexts, where the quality if the 1954 aerial photos made it possible, the mapping and classification methodology used in the ALPTER Project (Scaramellini and Varotto 2008) was applied. After having photo-interpreted and digitalized the terraces present in the landscape on the two dates, their presence was considered in relation to a homogeneous surface area, elaborating quantitative ratios.

An index of extension of the terracing was derived from the calculation of the density of the terraced polygons on a hexagonal template with an area of 10,000 m^2 (1 ha), accomplished using the "Repeating shapes" extension for ArcGIS (Jenness 2006). The sample area was analyzed reinstating the terraced area value within each hexagon. The maximum reachable value is, naturally, 1, i.e. 1 ha of terraced area per hectare of land. The analysis results were grouped in "density" classes, with the follow classification (Scaramellini and Varotto 2008):

- Microterraced landscape: 0.01–0.33 m^2/m^2;
- Mesoterraced landscape: 0.33–0.66 m^2/m^2;
- Macroterraced landscape: 0.66–1.00 m^2/m^2.

The index of intensity of the terracing was then calculated as the ratio between vertical lines of the terraced system and the horizontal surfaces, expressed as linear metres of dry-stone wall (the edge of the terraces) referred to the unit area of 1 ha. This operation allowed the linear datum to be elaborated as a parameter of surface area and to obtain spatial elements (the reference hexagons) that can be compared with the other information in the database. In general terms, the higher is the value of the density, the further is the distance from the original morphology and the greater is the need for management of the territory; the higher is the density, the greater is also the potential fragility of that part of the terraced system, especially in the case of

Fig. 2.1 3-D model of the Lamole study area

no or reduced maintenance. This index was expressed in linear metres per hectare, defining the following three classes:

- Low intensity: 5–200 m/ha;
- Average intensity: 200–800 m/ha;
- High intensity: > 800 m/ha.

Combining the classes of density and intensity, it was possible to classify the terraced systems in nine potential classes, which follow a gradient of increasing human impact on the territory, identifying areas from "microterraced at low intensity" to areas "macroterraced at high intensity".

The structure of the landscape has also been evaluated through some indexes of landscape ecology, as the Hill's Diversity Number, the Shannon's Index of Dominance, the number of patches, the average area of the patches and the number of land uses. The Sharpe's Index has been used to demonstrate the most significant dynamics during the time gap, while the Historical Index highlights the landscape emergencies, i.e. the land uses most at risk of disappearance.

2.2 The Lamole Study Area: Greve in Chianti (Region of Tuscany)

The Lamole study area (Fig. 2.1) covers 700.82 ha, and is situated in the municipality of Greve in Chianti, in the province of Florence. The hamlet of Lamole is in the southern part of the territory, and the centre of the study area lies approximately 580 m a.s.l. The area is privately owned. The geological substrate of the area is formed mainly by turbidite quartzose (42 %), feldspathic sandstones (27 %), with calcite (7 %), phyllosilicates (24 %) and silty schists, while in the south there are friable yellow and grey marls of Oligocene origin.

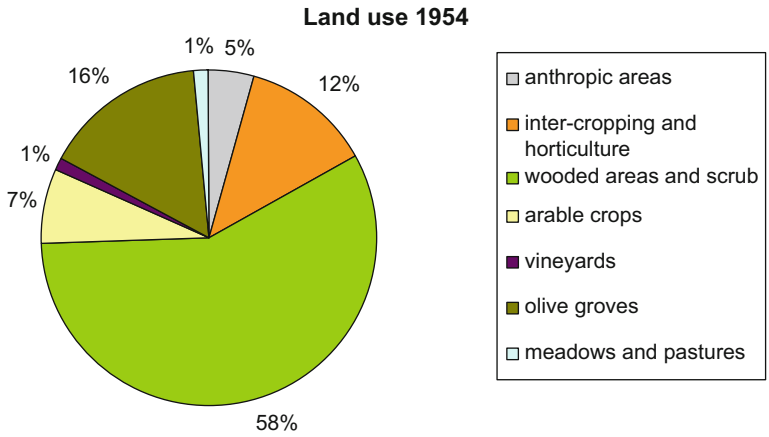

Fig. 2.2 Percentages of land use for 1954 in Lamole

2.2.1 The Landscape in 1954

Analysis of the aerial photos shows that in 1954 the landscape was dominated by woodland (Fig. 2.2), which covered more than half of the area (58 %), followed by various types of farmland (36 %), anthropic areas (5 %), meadows and pastures (1 %).

Most of the wooded areas are classified as broadleaved woodlands (46 % of the total), but there are also mixed (2.5 %) and conifer woodlands (1.6 %); there is also a significant amount of scrub formations (7.1 %). The agricultural landscape appears to be more fragmented than the forestry one (Fig. 2.3). The best-represented land use class is that of olive groves in monoculture (16 % of the study area), mainly olive groves with irregular layout, of which there are about 99 ha, against the 11.3 ha of olive groves with regular layout. Specialized vineyards are instead not typical of the traditional landscape (1 % of the total area), in that vines were mainly grown as mixed cultivations, or intercropping. Indeed, the agricultural land use type that most characterizes the Lamole landscape in the 1950s is inter-cropping, with six types identified, the most common of which is "arable crops with olive trees and vines" (5.5 % of the entire area). Land growing arable crops covers 7 % of the study area (20 % of the farmland). Pastures and meadows are instead of limited landscape or historical-cultural importance, given that livestock rearing had a decidedly marginal role among farming activities in Lamole (Table 2.1).

2.2.2 Today's Landscape

Today (Figs. 2.4, 2.5, 2.6) the Lamole landscape continues to be dominated by woodlands, which cover 69 % of the territory. These are followed by agricultural areas (26 %) and anthropic areas (5 %), while pastures and meadows remain very limited (less than 1 %).

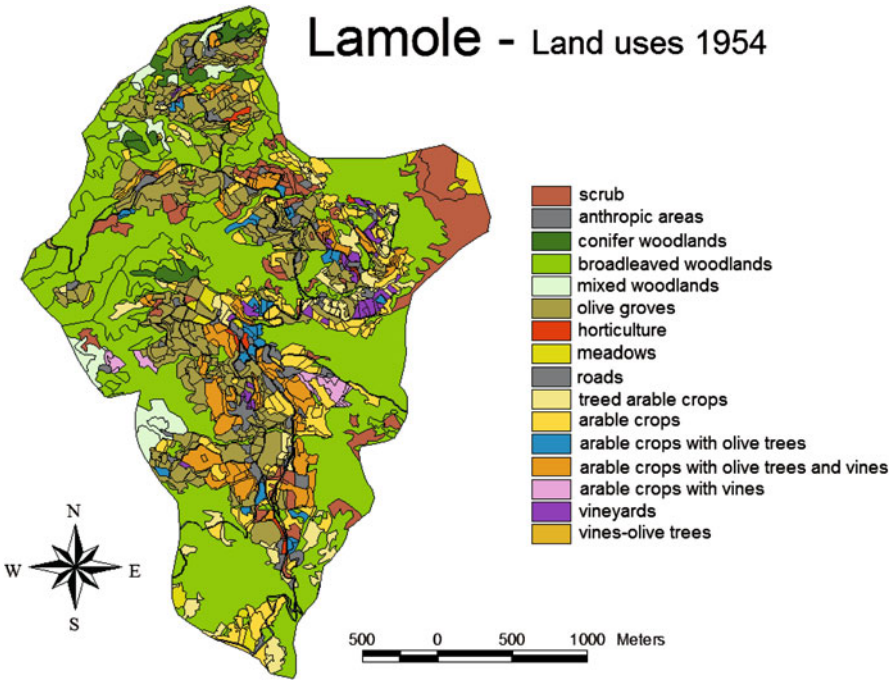

Fig. 2.3 Map of the land uses in 1954 in Lamole

Table 2.1 Land use classification for 1954 in Lamole

Land use 1954	Area (ha)	Percentage
Anthropic areas	21.70	3.10
Horticulture	2.33	0.33
Broadleaved woodlands	324.97	46.37
Conifer woodlands	11.19	1.60
Mixed woodlands	17.64	2.52
Scrub	49.54	7.07
Arable crops	50.08	7.15
Treed arable crops	27.84	3.97
Contoured vineyards	6.96	0.99
Longitudinal vineyards	1.14	0.16
Olive grove with regular layout	11.36	1.62
Olive grove with irregular layout	98.91	14.11
Vines-olive trees	2.54	0.36
Meadows	8.07	1.15
Treed pastures	2.08	0.30
Arable crops with olive trees	9.38	1.34
Arable crops with vines	5.97	0.85
Arable crops with olive trees and vines	38.72	5.52
Roads	10.38	1.48
Total	*700.81*	*100.00*

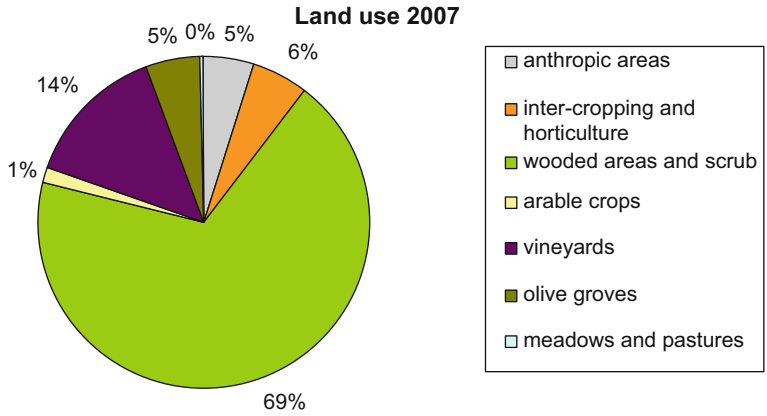

Fig. 2.4 Percentages of land use for 2007 in Lamole

Fig. 2.5 The landscape of Lamole today

Within the wooded areas, broadleaved woodland is still the main class of land use, covering 50.3 % of the entire surface area, followed by mixed woodland (7.2 %), conifer woodland (6.3 %) and scrub (4.5 %); there is also sporadic reforestation, limited to little more than 1 ha.

Farming remains the main production nucleus of Lamole, and specialized vineyards have become the most widespread class of agricultural land use (on 14 % of the study area), overtaking olive groves that are reduced to 5 %. The local landscape still conserves a few significant areas of traditional inter-cropping, especially

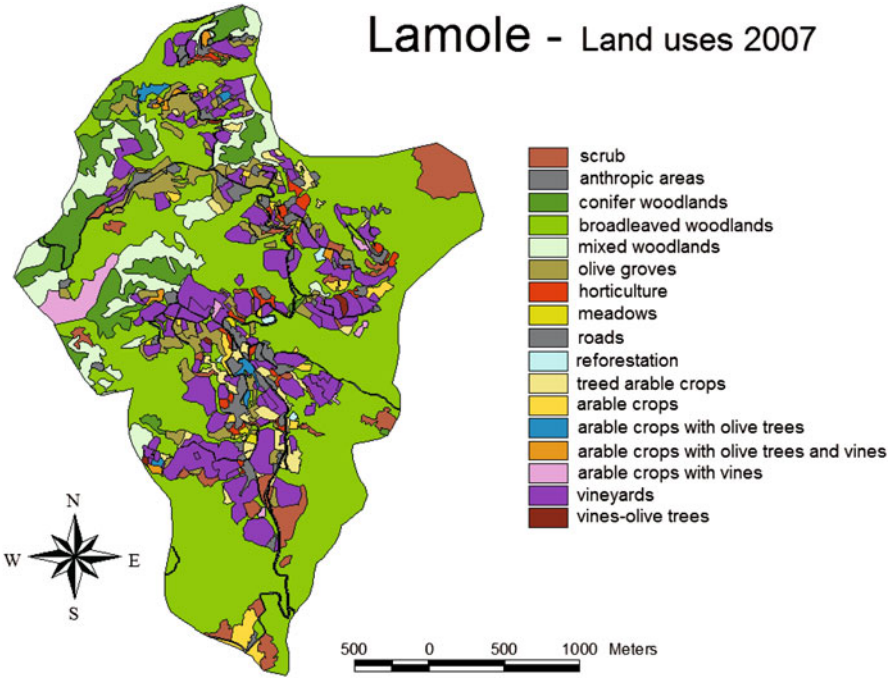

Fig. 2.6 Map of land uses of Lamole in 2007

as regards the mix between arable crops and vines (1.4 % of the area). Arable crops, both simple and treed, have seen a marked reduction in surface area over the past 50 years, but being on 1.3 and 1.9 % of the study area respectively, they are still an important landscape spatial component. The land occupied by anthropic areas has remained practically unvaried since 1954, while meadows and pastures continue to play a marginal role in the local landscape mosaic (Table 2.2).

2.2.3 Landscape Changes in the Period 1954–2007

The first piece of information that emerges from the overlaying of the data relating to the landscapes in 1954 and 2007 is that there has been no land use change on approximately 70 % of the analyzed territory (Fig. 2.7). The most significant dynamic is the expansion of woodland areas (14 %), followed by intensification (9 %), extensification (3 %) and deforestation (3 %), while urbanization is very limited in terms of surface area involved (1 %).

Cross tabulation allows the changes to the Lamole landscape to be analyzed in detail (Table 2.3).

The surface increase in wooded areas is mainly through forestation, while conifer plantations involve just 2.6 ha, and only a small part of the woodland expansion is

Table 2.2 Land use classification for 2007

Land use 2007	Area (ha)	Percentage
Anthropic areas	25.04	3.57
Horticulture	7.43	1.06
Broadleaved woodland	352.43	50.29
Conifer woodland	44.17	6.30
Mixed woodland	50.46	7.20
Reforestation	1.17	0.17
Scrub	31.68	4.52
Arable crops	9.21	1.31
Treed arable crops	13.48	1.92
Contour planted vineyard	34.03	4.86
Longitudinal vineyard	64.99	9.27
Olive grove with regular layout	14.10	2.01
Olive grove with irregular layout	23.36	3.33
Vines-olive trees	1.26	0.18
Meadows	1.48	0.21
Arable crops with olive trees	2.81	0.40
Arable crops with vines	10.04	1.43
Arable crops with olive trees and vines	3.54	0.51
Roads	10.11	1.44
Total	*700.81*	*100.00*

contrasted by deforestation. Most of the forestation has replaced inter-cropping, olive groves and arable crops, indicating a partial and significant abandoning of farmlands, on an area of around 65 ha. Part of the deforestation involves scrublands, that pass from 49.7 ha in 1954 to around 32 ha in 2007, which are eliminated to make way for new specialized crops, mainly vineyards. The expansion of conifer woodlands is not always due to conifer plantations but in most cases a change in composition of mixed and broadleaved woodlands, passing from 11 ha in 1954 to 44 ha in 2007. Although there are new conifer woodlands on land at one time occupied by agricultural areas, most of these new 33 ha are on ex broadleaved woodlands.

Intensification is mostly due to the planting of specialized vineyards in place of other crops, in particular inter-cropping and arable crops, while olive groves have instead undergone a drastic reduction from approximately 111 ha to just 37 ha.

The land uses typifying the Lamole landscape after the Second World War come under the heading of inter-cropping, that despite the strong reduction in area (− 55 %), still conserves all the types that were identified for 1954.

2.2.4 Terracing

One of the main elements that have characterized the Lamole agricultural landscape, like many hilly and mountainous areas in central Italy, are the terraces, thanks to which it has been possible to cultivate otherwise unsuitable steeply sloping land. In 1954 there were many more terraced areas than today. More specifically, there

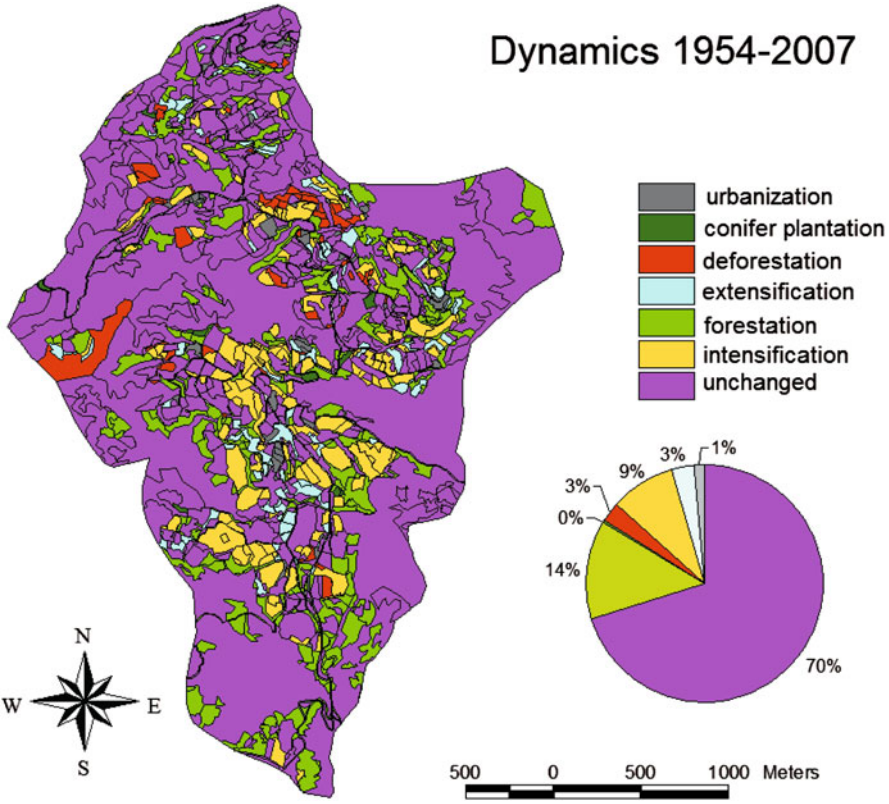

Fig. 2.7 Map and percentages of the evolutionary dynamics in Lamole for the period 1954–2007

were 749 stone walls with total length of 51,875 m, whereas now there are 515 stone walls with a total length of 30,694 m (Fig. 2.8). Apart from the absolute values, it is interesting to cross tabulate these data with those relative to land uses, to analyze which crops were grown on terracing in the past and which are now. In 1954, 45 % of the terraces were associated with olive-growing, 33 % with inter-cropping, 10 % was used for arable crops, and only 2 % was occupied by vineyards in monoculture. Despite the strong regression in the olive-growing sector, in 2007 31 % of the terraces continue to be used for olive-growing, and more than half of the olive groves are found on terraced land. 28 % of the terraces contain specialized vineyards (but only 17 % of vineyards are found on terraces) and 24 % inter-cropping.

These data demonstrate that the Lamole landscape is still today profoundly linked to the presence of terraces, notwithstanding a strong regression. In fact, with less regular maintenance of the dry-stone walls, around 40 % of the terracing has been lost in only 50 years, and 10 % of those still remaining are affected by secondary successions following the abandoning of farming activities. The presence of the terraces currently appears to be more closely linked to the cultivation of olives rather

Table 2.3 Cross tabulation of the evolutionary dynamics for the period 1954–2007

	LAND USES 2007																			
LAND USES 1954	anthropic areas	horticulture	broadleaved woodlands	conifer woodlands	mixed woodlands	forestation	scrub	arable crops	treed arable crops	contoured vineyard	longitudinal vineyard	olive grove with regular layout	olive grove with irregular layout	vines-olive trees	meadows	arable crops with olive trees	arable crops with vines	arable crops with olive trees and vines	roads	**TOTAL**
anthropic areas	16.25	0.34	3.28	0.20	0.30	0.03	0.19		0.52	0.41	0.22	0.18	0.15						0.03	22.10
horticulture	0.36	0.47	1.19							0.22	0.09									2.33
broadleaved woodlands	0.34	0.16	241.95	35.29	34.59		2.67	0.04		0.23	1.44	0.18	0.10		0.09		7.01	0.51	0.38	324.98
conifer woodlands			3.92	4.95	1.46						0.86									11.19
mixed woodlands	0.10		7.34	2.26	7.93															17.63
Scrub	0.71	0.56	27.87	0.28	0.98		11.51	0.26	0.64	1.25	3.52	1.37	0.28		0.09	0.30			0.07	49.70
arable crops	1.94	0.54	15.89	0.10	1.64	0.37	4.77	3.67	1.96	6.74	10.97	0.79	0.03			0.04	0.55		0.16	50.18
treed arable crops	0.88	0.58	14.23	0.27	1.75		2.00	0.91	1.55	1.91	2.19	0.81	0.15	0.04		0.11	0.52			27.91
contoured vineyard	0.73		0.65				0.02	0.61	0.33	1.53	2.75		0.23					0.16		6.99
longitudinal vineyard			0.04								0.35	0.77								1.15
olive grove with regular layout	0.37		1.37	0.30	0.37		0.11		0.40	0.92	5.97	1.23	0.21				0.11		0.05	11.40
olive grove with irregular layout	2.67	2.89	20.40	0.49	0.88	0.14	3.16	1.74	3.75	15.19	17.28	5.89	18.62	1.03	1.02	0.51	0.71	2.46	0.50	99.33
vines-olive trees			0.55		0.35				0.28	0.31		0.61	0.44							2.54
meadows	0.01		2.17				3.53	0.83		0.42	0.59				0.27		0.24			8.06
treed pasture			0.23							0.09	1.76									2.08
arable crops with olive trees		0.48	1.91			0.47	1.07	0.15	0.67	1.18	1.65	0.26	0.49			1.06				9.39
arable crops with vines			2.52		0.49		0.16		0.42	0.53	1.97						0.17			6.26
arable crops with olive trees and vines	0.64	1.41	6.35	0.04		0.16	2.61	1.03	3.05	3.11	13.79	2.07	2.72	0.18		0.78	0.72	0.49		39.13
Roads	0.04		0.96		0.09		0.08		0.05	0.04	0.14								3.20	4.59
TOTAL	25.04	7.42	352.81	44.18	50.85	1.17	31.88	9.22	13.62	34.08	65.55	14.14	23.42	1.26	1.48	2.81	10.04	3.62	4.39	**696.96**

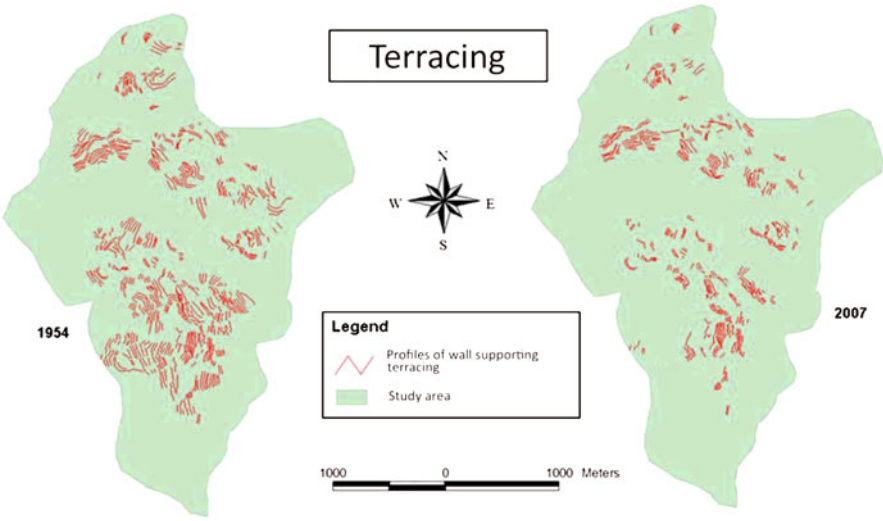

Fig. 2.8 Map of stone walls supporting terraces in 1954 and 2007

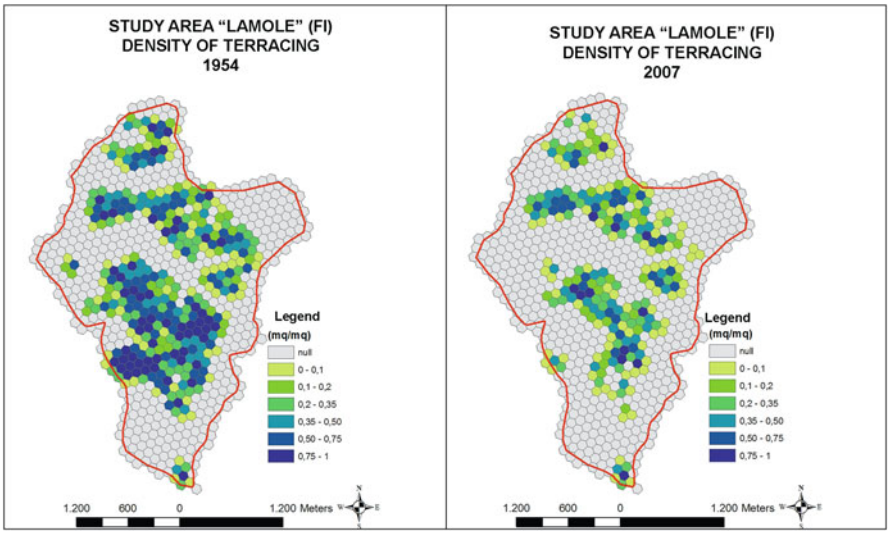

Fig. 2.9 Density of terraces in Lamole

than vines, and the trend towards the reduction in olive groves to make way for vineyards risks leading to the disappearance not only of the olive trees, but also of the terraced landscape.

The density and the intensity of terraces on the two dates are reported in Figs. 2.9 and 2.10.

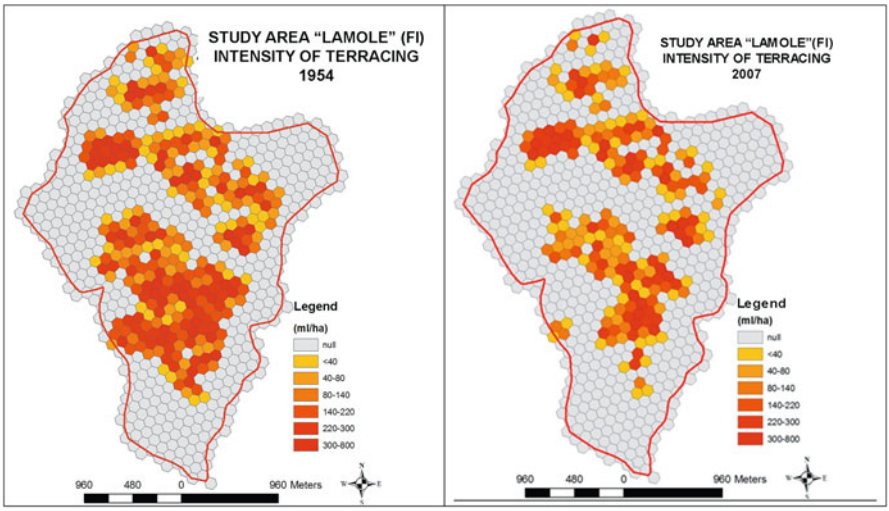

Fig. 2.10 Intensity of terraces in Lamole

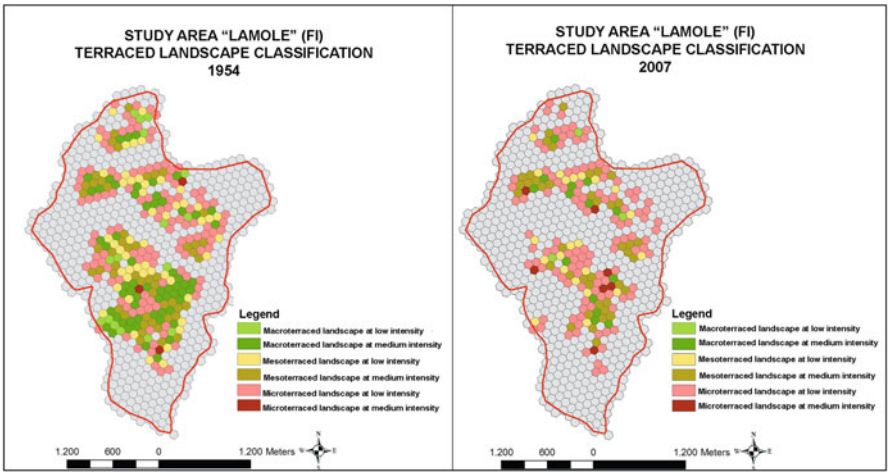

Fig. 2.11 Comparison between classification of the terraced landscape in 1954 and 2007 in Lamole

Despite the class of highest intensity not being present in the Lamole area even in 1954 (a class that is attributed to very unusual situations in the Italian panorama), there is a substantial reduction in the terraces, passing globally from 50 to 30 km of dry-stone walls, with a reduction of around 40 %. The combination of the density and intensity of terracing has led to a classification of the terraced territory (Fig. 2.11).

The comparison demonstrates the prevalence of landscape types and differences between the two periods measured by the indexes. They are obviously concise classifications that, as is clear from the map, have marked internal variations, but in

Table 2.4 Indices of landscape ecology

	1954	2007
Number patches	1184	479
Average area patch (ha)	0.59	1.46
Number land uses	18	17
Hill's diversity number (N1)	7.06	6.79
Shannon's index of dominance (D1)	0.94	0.92

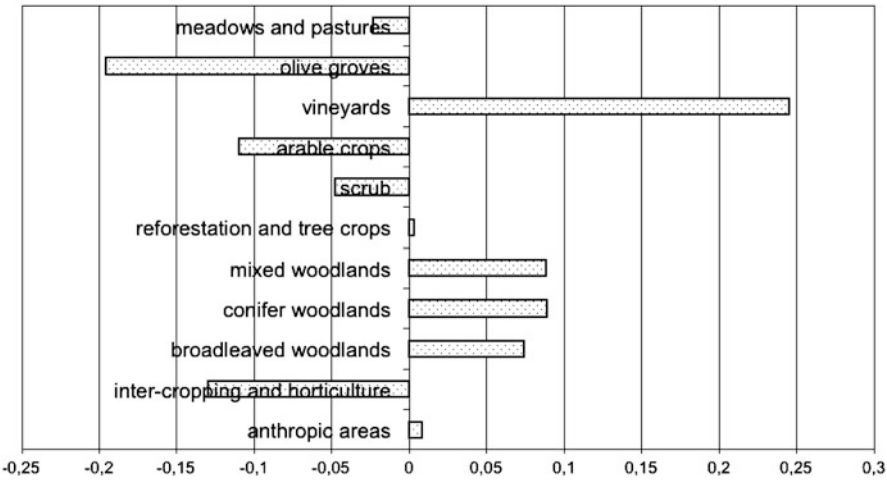

Fig. 2.12 Sharpe's Index for the period 1954–2007

any case constitute a potentially valuable tool for an initial general characterization, to be able to compare areas that differ by geography, history and land use and assign a more precise geographical nomenclature than those proposed so far (Scaramellini and Varotto 2008).

2.2.5 The Indexes of Landscape Ecology

The indexes of landscape ecology (Table 2.4) demonstrate a tendency towards simplification and homogenization of the landscape mosaic. The fragmentation of the landscape has notably reduced with the passing of time, while the number of land uses has remained constant, indicating that the variety of land uses that characterized the historical landscape has not yet been lost.

Sharpe's Index (Fig. 2.12) demonstrates that the most significant dynamics are the expansion of specialized vineyards and the consequent reduction in olive groves (from 161 to 45 ha) and inter-cropping. All types of woodland have increased, whereas scrub areas are in regression due to the expanding of broadleaved woodlands.

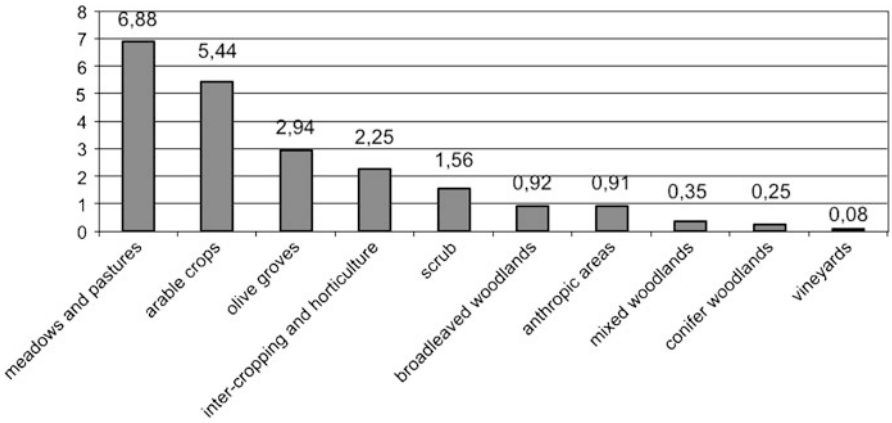

Fig. 2.13 Historical index values for the different land uses

Arable land also shows a marked diminution caused by the spread of specialized viticulture and phenomena of secondary succession that have led to the expansion of woodland following the abandoning of arable crops.

The Historical Index (Fig. 2.13) makes it possible to highlight the landscape emergencies, i.e. the land uses most at risk of disappearance. The land uses with the highest Historical Index values are meadows and arable crops. Whereas meadows have never been a characteristic element of the local landscape and their disappearance would not endanger maintenance of the historical landscape, for the arable crops, even if they are not one of the principal identifying elements, a strong reduction would certainly lead to an obvious landscape simplification. Olive groves are in strong regression, having been abandoned due to a progressive loss of economic importance, and their maintenance should be one of the main objectives of a correct landscape management, especially of the terraced types (HI = 4.56) with respect to those on flat land (HI = 2.81) and in particular of the terraced olive groves with irregular layout (HI = 6.3), while the non-terraced olive groves with regular layout have a very low value (HI = 0.2), which confirms their recent diffusion. Inter-cropping is the fourth land use type in order of risk of disappearance, a group of land uses which, due to their structural characteristics, are fundamental for landscape diversification, as historical testimony and reservoir of cultivated biodiversity.

The areas of scrub have also reduced, but their current surface area is still quite high and therefore constitutes an important land use, not only for the landscape role, but also for the habitat they provide, especially for birds. All the other land uses have Historical Index values of less than 1, indicating that the current area is larger than that of 1954.

By integrating the Historical Index values with cartographic data, a map (Fig. 2.14) is obtained showing the zones with land uses that are at major risk of disappearance, therefore the most sensitive areas in need of careful conservation. These areas, formed mainly of olive groves, inter-cropping and arable crops, are generally small and located in typically farming areas and along roadsides.

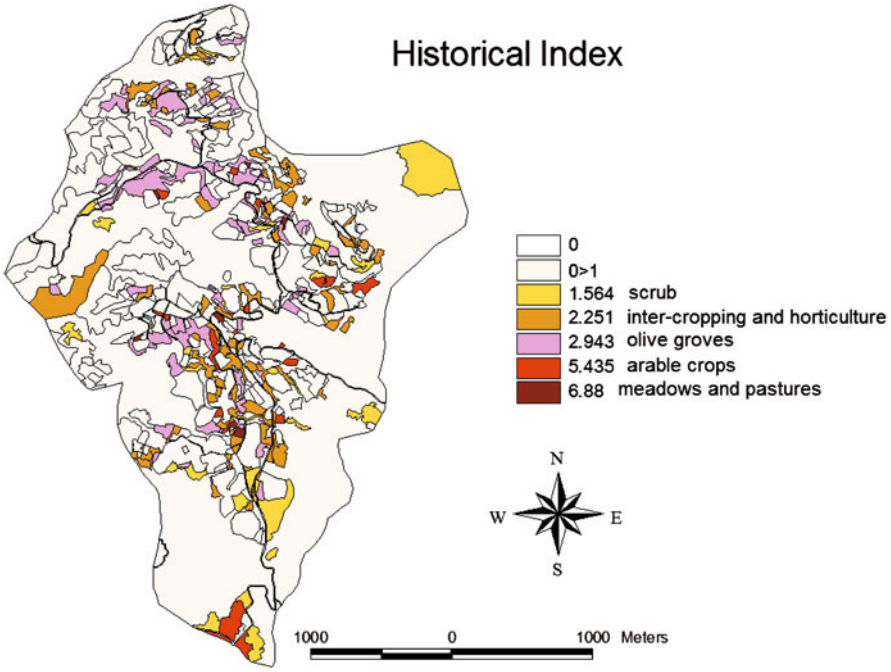

Fig. 2.14 Historical index for the period 1954–2007 in Lamole

2.2.6 Discussion of the Results

At Lamole, in comparison with other areas of Tuscany, the principal characteristics of the historical landscape have remained in a satisfactory state, notwithstanding many changes to the structure of the landscape mosaic and cropping systems. However, attention should be paid to the vulnerable elements that could compromise the maintenance of traditional systems in the future. The principal characteristic elements of the historical landscape that should be preserved are the olive groves (especially those with irregular layout and terraced), inter-cropping, arable crops, and the presence of terracing. In reality, the principal element is the complex structure of a highly fragmented mosaic, which must maintain the equilibrium between the various land uses and between the forestry and farming sectors. The specialized vineyards have progressively expanded since 1954, but some operations of restoration of the historical terracing and their cultivations would seem anyway to exclude any risk of the creation of a landscape of industrial viticulture, as has happened in the majority of the other Tuscan areas producing quality wines (the average vineyard size is still not too large, passing from 0.3 to 0.8 ha). The restoration of the terraces with contoured layout and their systems for water run-off are due to the realization of the role that traditional practices play in the improvement of the relationship between product quality and landscape quality, and the increased importance given to

the role of the landscape by the rural development policies. There has anyway been widespread specialization in viticulture at Lamole, which has contributed towards a homogenization and marked simplification of the structure of the local landscape, with a huge reduction of vines in inter-cropping and in the contoured layout (in 1954 86 % of the vineyards were contour planted, today 34 % are, in reality not a too low value). It is therefore necessary to limit the creation of combinations of excessive size and the expansion of vineyards on land used for other crops in order to maintain the variety of cropping systems present in the area.

Conservation of the terraces, given the 40 % reduction, must also be a priority for management aimed at maintenance of the historical landscape, by restoring the stone walls in a poor state and protecting no longer cultivated terraces from secondary successions. The loss of the stone walls is in fact not only the loss of an element that strongly characterizes the landscape from the aesthetic point of view, but also the loss of a cultural and historical heritage and of traditional wall-building skills. Lastly, has to be remembered the importance of the terraces and their associated hydraulic systems for water regulation and protection against surface erosion. The results from a research conducted in the Chianti area are emblematic: following the expansion of cultivations in up hill longitudinal rows, erosion increased by 900 % in the period 1954–1976, the annual erosion in the up hill longitudinal vineyards resulted as being particularly intense, at around 230 t/ha (Zanchi and Zanchi 2006).

The principal evolutionary dynamics, and one of the main problems throughout the mountain and hill farming areas of the Apennines, is woodland expansion, with the consequent homogenization of the landscape that progressively differs from the traditional one, which was characterized by an equilibrated integration of forested and farmed areas. The management choices aimed at conservation and enhancement of the landscape should therefore be directed towards a correct management, limiting its expansion on new lands and maintaining the open spaces, such as scrublands. Attempts should also be made to promote the recovery of part of the inter-cropping and olive groves with irregular layout, as has been successfully done for the restoration of some historical vine-growing terraces, with the principal menace to the integrity of the remaining historical landscape being the intensification of the viticulture sector and the abandoning of other farming activities.

2.3 The Costa Viola Study Area (Calabria Region)

The study area is situated on the Tyrrhenian coast of Calabria, in the municipalities of Palmi, Seminara and Bagnara Calabra, in the Province of Reggio Calabria. The area is almost wholly comprised within the ZSP Costa Viola and affected by the SCI Costa Viola and Monte S. Elia. The lands are mainly privately-owned, lying between 0 and 500 m a.s.l. The area, covering 764.73 ha, lies on a geological substrate prevalently formed by amphibolic-schists and mica-schists with veins of pegmatite and jalomicte, while the more internal areas have a substrate composed of red clay sands and conglomerates of sandy-clay bound crystalline pebbles.

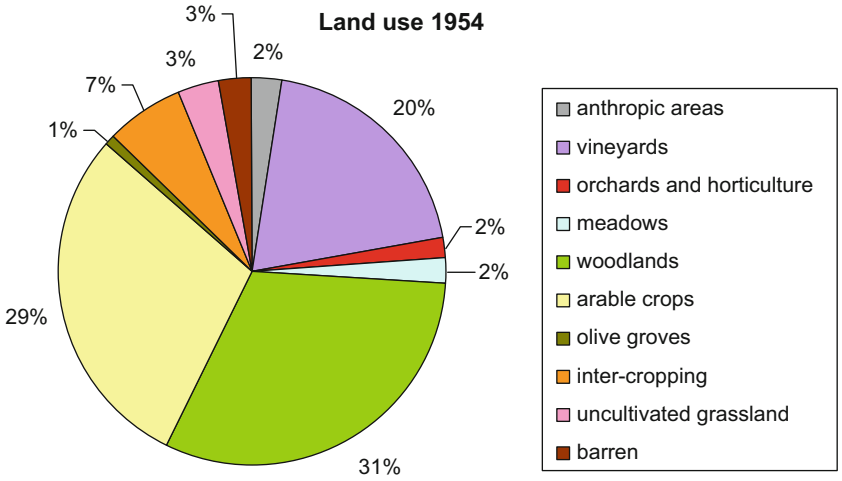

Fig. 2.15 Percentages of land use for 1954 in Costa Viola

2.3.1 The Landscape in 1954

The landscape in 1954 is fairly heterogeneous, with a prevalence of farming areas (Fig. 2.15), composed of arable crops (29 % of the study area), vineyards (20 %), inter-cropping (7 %), orchards and horticulture (2 %), and olive groves (1 %), while woodlands cover 31 % of the surface area. The other land use classes identified are: uncultivated grasslands (3 %), barren areas (3 %), meadows (2 %) and anthropic areas (2 %).

The agricultural sector has a preponderance of arable crops (50 % of the farmed areas), followed by vineyards (34 %) and inter-cropping (11 %), composed of four different types (Table 2.5). Olive trees, apart from 6 ha, are always inter-cropped with vines and arable crops. Indeed, if the different types of inter-cropping are also considered, the percentage of land occupied by olive trees, vines and arable crops in the study area reaches 7, 24 and 36 %, respectively. There are also some orchards and some horticulture.

Broadleaved woodlands account for 58 % of woodland, but there are also areas of scattered vegetation and scrub, on 5.6 and 6.5 % of the study area respectively (i.e. 18 and 21 % of the wooded areas), and 7.6 ha of conifer woodlands (3 % of the woodland).

The distribution of land uses in the study area follows its morphology (Fig. 2.16), with two distinct bands: one directly facing the sea, characterized by steep slopes and alternating woodlands and vineyards, the latter growing on the traditional small terraces that typify the local landscape; while the flat internal area, at around 400–500 m a.s.l., is mainly used for arable crops, with large fields (up to 30 ha), and a highly fragmented mosaic of inter-cropping in the southern part.

Table 2.5 Land use classification for 1954 (Costa Viola)

Land use 1954	Area (ha)	Percentage
Anthropic areas	11.06	1.45
Vineyards	152.72	19.97
Orchards	12.23	1.60
Meadows	15.55	2.03
Horticulture	0.64	0.08
Broadleaved woodlands	137.91	18.03
Conifer woodlands	7.57	0.99
Scrub	49.65	6.49
Area with scattered vegetation	42.78	5.59
Arable crops	224.15	29.31
Olive groves with regular layout	6.57	0.86
Vines-olive trees	0.31	0.04
Arable crops with olive trees	21.08	2.76
Arable crops with vines	3.75	0.49
Arable crops with olive trees and vines	25.97	3.40
Uncultivated grassland	24.66	3.22
Waters	3.14	0.41
Rocky outcrops	17.96	2.35
Roads	7.01	0.92
Total	*764.73*	*100.00*

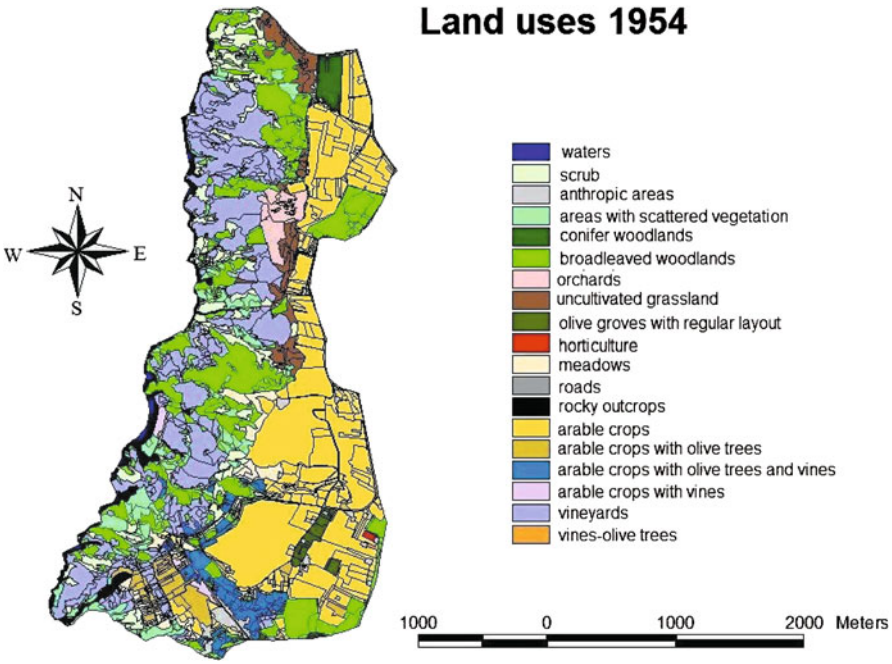

Fig. 2.16 Map of the land uses in 1954 (Costa Viola)

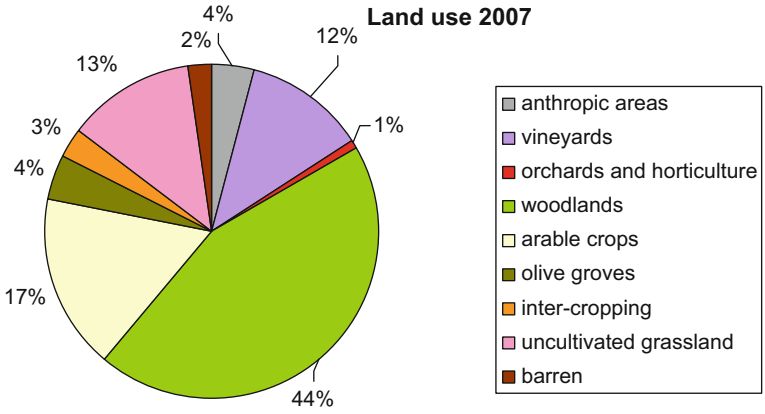

Fig. 2.17 Land use cover percentages for 2007 (Costa Viola)

2.3.2 Today's Landscape

The Costa Viola landscape in 2007 appears to be dominated by woodland and scrub, which now cover 44 % of the surface (Fig. 2.17). The characteristic land uses, arable crops and vineyards, are instead in net reduction, and are found on 17 % and 12 %, respectively. These are followed by uncultivated grassland (13 %), olive groves (4 %), anthropic areas (4 %), inter-cropping (3 %), barren areas (2 %), orchards and horticulture (1 %) (Table 2.6).

Of the wooded areas and scrub, the most widespread are broadleaved woodlands (51 % of the category), but the notable amounts of scrub (35.5 %) and areas with scattered vegetation (6 %) indicate the widespread presence of secondary successions on land at one time used for farming.

Altogether, the lands used for agriculture are 37 % of the entire study area, and the most widespread are arable crops (47 % of the cultivated areas), mainly located in the flatter inland area (Fig. 2.18), followed by vineyards (32 %), which still represent the characteristic element of the area, and olive groves (12 %), which are found mainly in the southern part of the area with both regular layout, the majority, and scattered. Of great importance is the maintenance of small plots used for inter-cropping (7 % of the cultivated areas) with arable crops, olive trees and vines.

Uncultivated grasslands are now found over 13 % of the area, a sign of widespread crop abandoning, while orchards have disappeared and horticulture survives only in the south of the study area.

2.3.3 Landscape Changes in the Period 1954–2007

During the last 50 years the Costa Viola landscape has undergone many changes, most of which have involved the traditional elements that ensured characteristics of

Table 2.6 Land use classification for 2007

Land use 2007	Area (ha)	Percentage
Anthropic areas	22.82	2.98
Vineyards	90.54	11.84
Horticulture	4.65	0.61
Broadleaved woodlands	174.99	22.88
Conifer woodlands	17.09	2.23
Mixed woodlands	5.75	0.75
Scrub	120.97	15.82
Area with scattered vegetation	21.64	2.83
Arable crops	131.11	17.14
Treed arable crops	0.51	0.07
Olive groves with regular layout	26.60	3.48
Olive groves with irregular layout	6.02	0.79
Arable crops with olive trees	10.59	1.38
Arable crops with vines	3.94	0.51
Arable crops with olive trees and vines	5.69	0.74
Uncultivated grassland	97.08	12.70
Waters	3.14	0.41
Rocky outcrops	13.21	1.73
Roads	8.41	1.10
Total	*764.73*	*100.00*

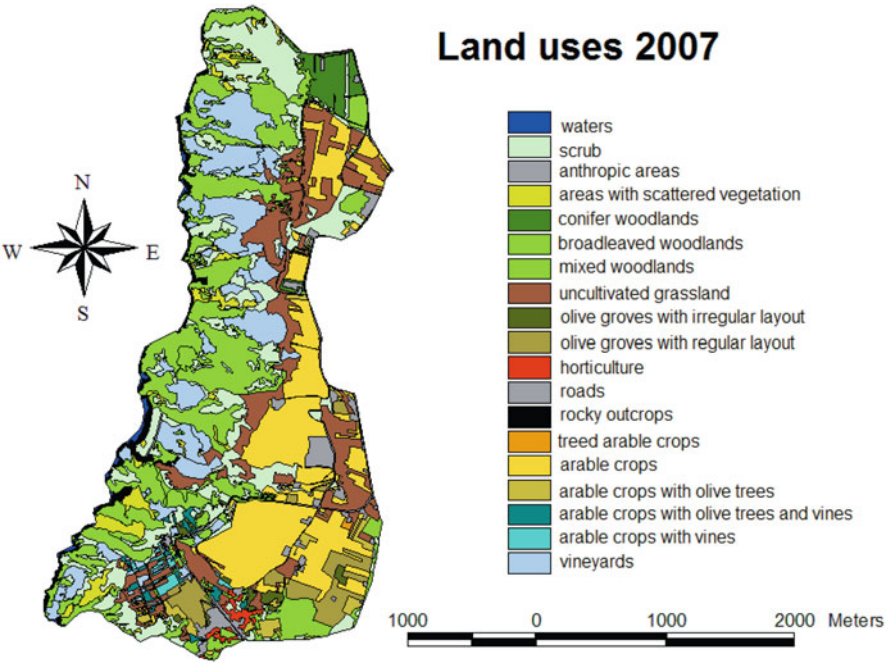

Fig. 2.18 Map of the land uses in 2007 (Costa Viola)

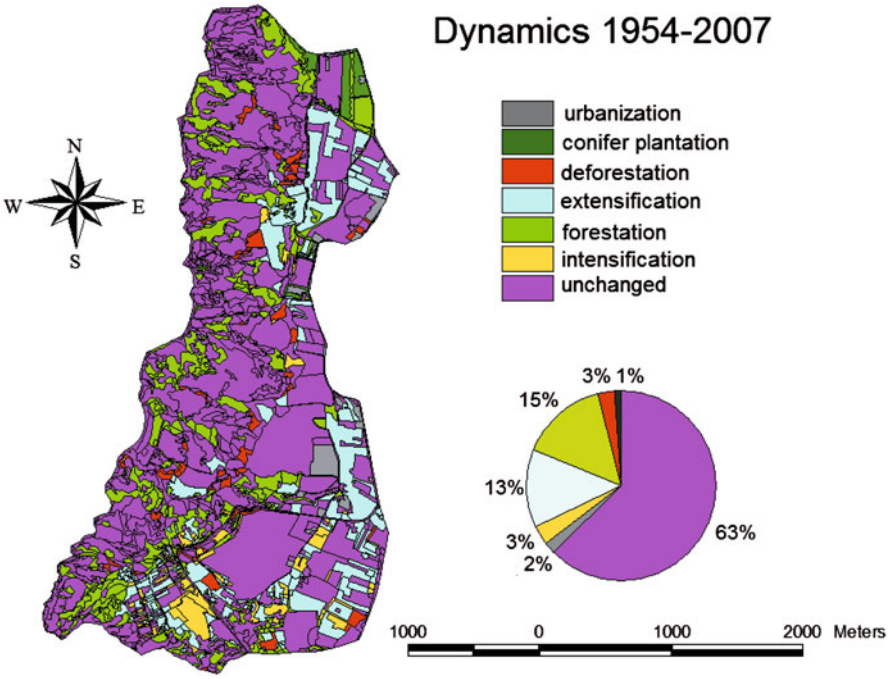

Fig. 2.19 Map and percentages of the principal evolutionary dynamics for the period 1954–2007

uniqueness to the local landscape; despite this, 63 % of the area remains unaltered (Fig. 2.19). The main process identified by the analysis of the evolutionary dynamics is the increase in woodlands, in particular forestation (on 15 % of the area), while the colonization of farmland by conifer woods is limited (1 %). The second dynamic process in order of importance is extensification (13 %), followed by intensification (3 %), deforestation (3 %) and urbanization (2 %).

The two principal dynamics identified, the increase in woodlands and extensification, which together cover 28 % of the study area, are closely connected to the abandoning of farming activities and phenomena of secondary succession. As can be noted from the cross tabulation (Table 2.7), 52 % of forestation happens on ex-vineyards, abandoned because of the difficult working conditions and low earnings from viticulture. This process is mostly localized in the areas with steeper slopes, on the terraces traditionally used for vines, but difficult to mechanize. Moreover, about 54 % of the forestation is in the form of scrub and areas classified as "scattered vegetation", a sign that the abandoning of the crops is quite recent. Conifers are limited to the extreme north of the study area, in correspondence to a probable reforestation operation. Extensification also mostly involves vineyards, but is also found on lands at one time used for arable crops, which, like the vineyards, have undergone a decided contraction in the period 1954–2007 (− 41 %). About 43 % of the old farmlands involved in extensification are today classifiable as uncultivated,

Table 2.7 Cross tabulation of the evolutionary dynamics for the period 1954–2007 (Costa Viola)

Land use 1954	Land use 2007																						Total
	waters	scrub	anthropic areas	areas with scattered vegetation	conifer woodlands	broadleaved woodlands	mixed woodlands	uncultivated grassland	olive groves with irregular layout	olive groves with regular layout	horticulture	roads	rocky outcrops	treed arable crops	arable crops	arable crops with olive trees	arable crops with olive trees and vines	arable crops with vines	vineyards				
waters	3.14	0.00				0.00							0.00										3.14
scrub		23.39		3.28	0.44	18.44		1.45	0.00			0.08	0.00		0.20	0.00			2.37				49.65
anthropic areas		0.24	9.05		0.06	0.36	0.08	0.07	0.18	0.34	0.17	0.02	0.00		0.36	0.00	0.00	0.00	0.13				11.06
areas with scattered vegetation		10.77		12.79	0.19	15.45		2.21					0.42		0.00	0.00			0.94				42.78
conifer woodlands		0.10	0.22		7.04	0.03		0.00				0.18											7.57
broadleaved woodlands	0.00	29.22	2.44	0.80		92.86	0.52	6.17	0.00	0.17	0.30	0.04	0.00		1.02	2.24	0.00	0.05	2.08				137.91
orchards						2.13		9.29							0.00				0.81				12.23
uncultivated grassland		9.80	0.00	0.87	1.95	2.51		7.81				0.04			0.35				1.34				24.66
olive grove with regular layout		0.04	0.24			0.58		1.02	0.00	1.07					2.82	0.79							6.57
horticulture						0.12		0.53															0.64
meadows		7.21	0.01	0.08	0.09	0.51		6.51	0.03			0.02			0.44	0.20	0.20		0.25				15.55
roads		0.00	0.00			0.00	0.00	0.00	0.00		0.00	7.01			0.00	0.00	0.00	0.00	0.00				7.01
rocky outcrops	0.00	1.44	0.00	1.87		1.78							12.79						0.08				17.96
arable crops		9.20	10.16	0.07	7.31	1.81	3.27	44.73	2.12	15.48	0.20	0.43		0.51	123.62	4.99	0.12	0.09	0.04				224.15
arable crops with olive trees		1.04	0.20			0.38		4.43	0.14	8.13		0.20			1.62	0.70	1.05	2.30	0.90				21.08
arable crops with olive trees and vines		4.11	0.28			4.13		4.97	3.22	0.18	3.85	0.21			0.46	0.91	1.41	0.58	1.58				25.89
arable crops with vines		1.38	0.04			0.40		0.00		1.22	0.06	0.08					0.17	0.41	0.00				3.75
vineyards	0.00	23.05	0.17	1.87		33.42	1.88	7.91	0.33		0.07	0.09	0.00		0.22	0.44	2.74	0.51	80.01				152.72
vines-olive trees																0.31							0.31
Total	3.14	120.97	22.82	21.64	17.09	174.91	5.75	97.08	6.02	26.60	4.65	8.41	13.21	0.51	131.11	10.59	5.69	3.94	90.54				**764.65**

Fig. 2.20 The terracing of Costa Viola

which means that in the not too distant future they will also probably be invaded by scrub vegetation, followed by trees.

Intensification, even if a minor process, 73 % of which is occurring on inter-cropping, is concentrated mainly in the south of the study area, i.e. with gentler slopes and better served by roads, where farming costs are lower.

Vineyards, the characteristic element of the area, are still present, even if greatly reduced (− 41 %), as is inter-cropping (− 60 %), and their conservation should be a priority.

2.3.4 The Terracing

The Costa Viola has a high steeply sloping coastline, but with a particularly suitable microclimate for vine-growing. For centuries man has remodelled the land to render it cultivable, building hundreds of kilometres of dry-stone walls to support small terraces no more than 3–4 m wide, almost all growing pergola-trained vines. However, the very steep slopes limit the use of machinery, so cultivation of these small and almost inaccessible terraces has become increasingly onerous and less remunerative, and the terraces have been progressively abandoned and invaded by scrub and tree vegetation, even if the majority of the walls are still in a good state of repair (Fig. 2.20).

In 1954 some terraces had already been invaded by vegetation (20 %), but most of the coast still had a terraced landscape characterized by intense farming activity. Instead, almost 40 % of the terraces show signs of abandonment and secondary successions in 2007 (Fig. 2.21).

The maintenance and restoration of the stone walls and terraced cultivations therefore appears even more necessary. Leaving aside their landscape and historical-cultural significance, they play a fundamental role in impeding phenomena of erosion

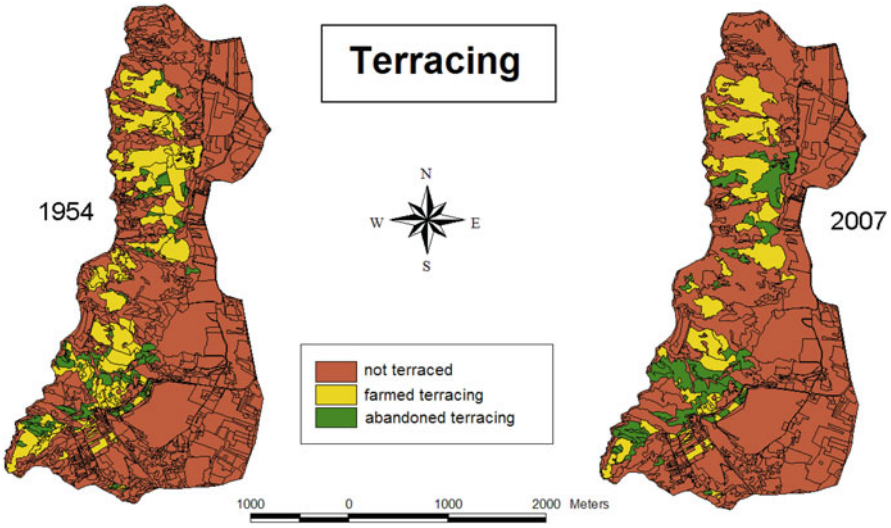

Fig. 2.21 Location and conservation state of the terraces. Comparison between 1954 and 2007 (Costa Viola)

and landslides that occur on such steep slopes, which are already evident in the few areas where the stone walls are in ruins, where landslides, sometimes big ones, are frequent.

The density of the terracing (Fig. 2.22) is very high, with a significant presence of the highest class (microterraced landscape), demonstrating the almost uniform structure of the terraced system. This indicator is only reported for 2007, as the variations since 1954 have not regarded so much the loss of terraces, but rather their abandoning.

The terracing intensity (Fig. 2.23) appears to be prevalently of the highest class, demonstrating an extremely well-developed terracing.

The classification of the terracing (Fig. 2.24) demonstrates a conspicuous presence of a landscape "macroterraced at high intensity" and shows the capacity of the classification method used to separate this situation from the one previously analyzed at Lamole.

2.3.5 The Indexes of Landscape Ecology

Analysis of the historical landscape demonstrates the presence of a mosaic traditionally dominated by few land uses and by medium-large sized patches, except for a small area where a highly fragmented mosaic is found. The values of the indexes (Table 2.8) should be read as a loss of the traditional landscape systems (further increase in the average area of the patches, diminution of Shannon's Index of Dominance), in a phase of evolution characterized by the abandoning of vineyards and the consequent increase in scrub and tree vegetation.

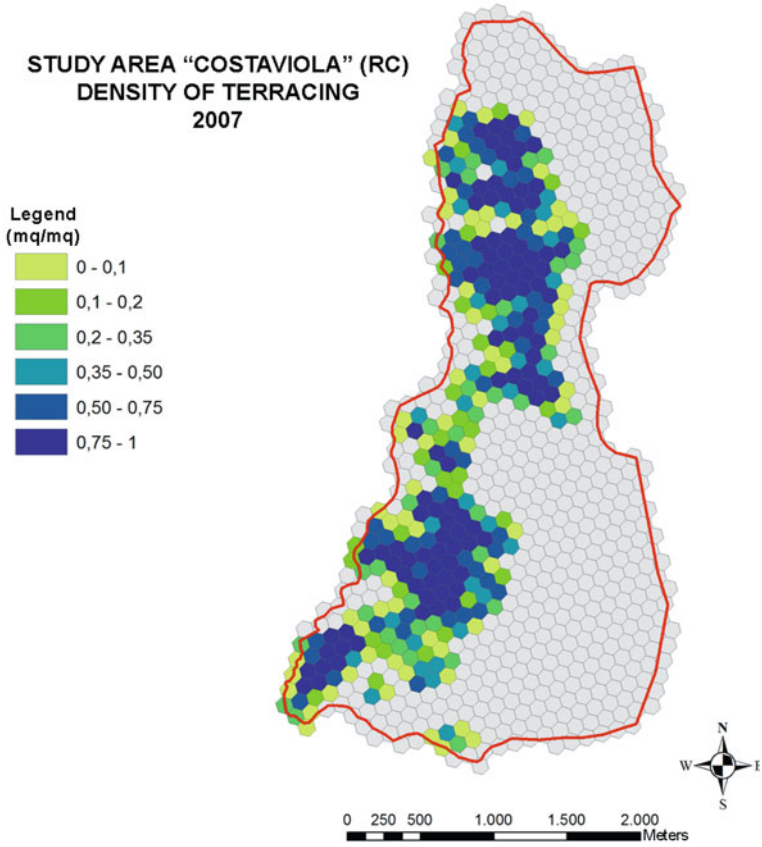

Fig. 2.22 Density of terracing in Costa Viola

Sharpe's Index (Fig. 2.25) confirms the previous data, and shows that the most important regressive processes are those related to the land uses of historical importance (vineyards, arable crops and inter-cropping). Their reduction is mainly balanced by the expansion of wasteland, scrub and wooded areas, formations indicative of processes of abandoning and secondary successions.

The value for olives refers only to olive groves in monoculture, which have increased since 1954, but overall the total olive-growing area has not changed very much (7 % of the study area in 1954 and 6.4 % in 2007) as the inter-cropping of olive trees, arable crops and vines was common in 1954.

The land uses with the highest Historical Index values (Fig. 2.26) are horticulture, orchards and inter-cropping, cropping types linked to traditional farming activities, which although limited in terms of total area, add notable quality to the landscape mosaic of the Costa Viola.

These are followed by areas with scattered vegetation, a land use linked to phenomena of abandoning, which should therefore not be a priority as regards conservation of the historical landscape as it is reduced by the arrival of secondary successions.

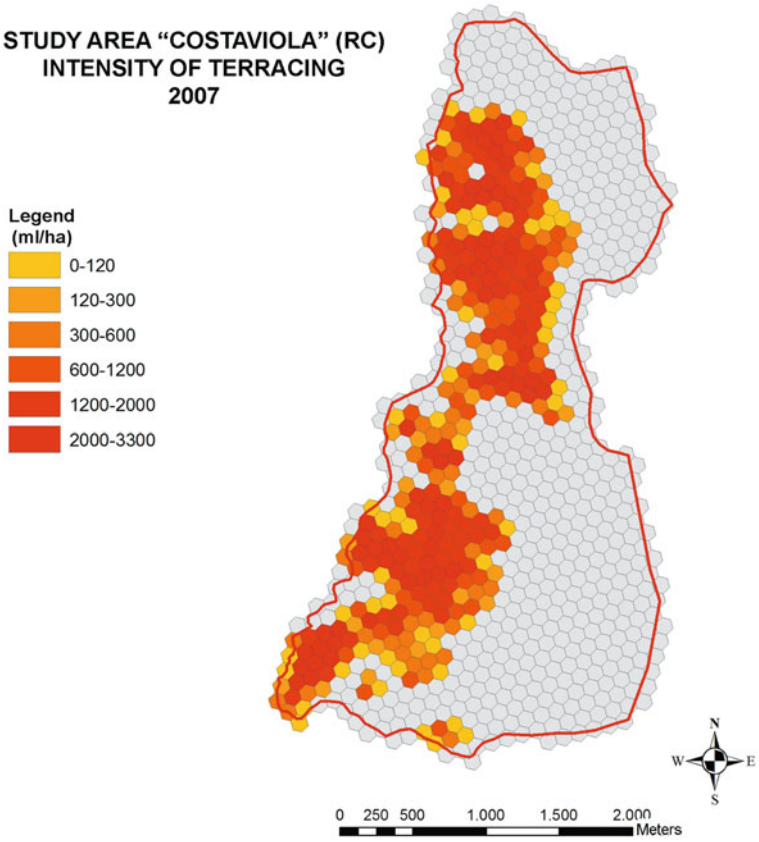

Fig. 2.23 Intensity of terracing (Costa Viola)

Arable crops and vineyards are instead the two identifying land uses of the farming landscape, and therefore necessitate careful management as any further reduction would signify an important loss of overall quality of the local landscape. Vineyards in particular register a strong contraction (− 41 %), even if the viticulture landscape still retains significant aspects, with a good total expanse of vine-growing terraces, and maintenance of the different types of inter-cropping of vines, arable crops and olive trees, typical land uses of high historical and landscape importance.

All the other land uses have values of between 0 and 1, which is a sign of their expansion over the territory between 1954 and 2007. These include olive groves, but in reality it is only the olive groves in monoculture that are spreading.

The terraces have been progressively abandoned, and this trend is also demonstrated by the Historical Index. The Index value calculated for the terraced land still utilized for farming is 1.42, demonstrating that maintenance of these terraces must constitute a priority for the conservation of the local historical landscape and also as a defence against the risk of landslides and surface erosion.

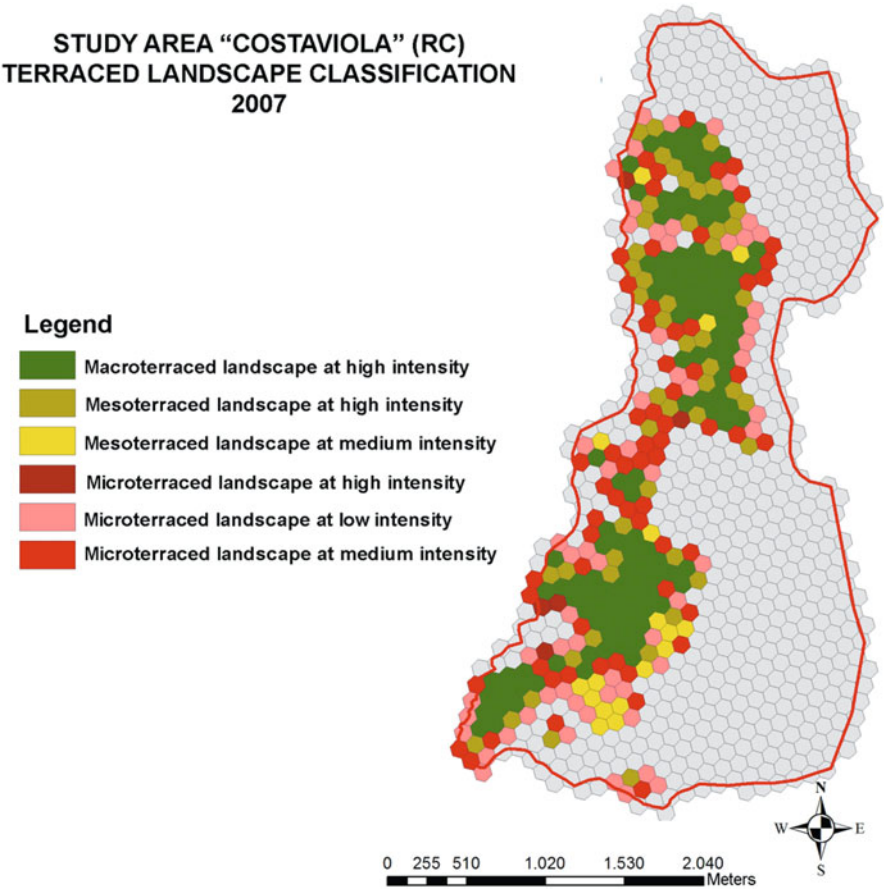

Fig. 2.24 Classification of the terraced landscape

Table 2.8 Indexes of landscape ecology

	1954	2007
Number of patches	1358	602
Average area patch (ha)	0.56	1.27
Number land uses	19	19
Shannon's index of dominance	0.81	0.71
Hill's diversity number	8.46	9.29

The Historical Index map (Fig. 2.27) shows that there are essentially three zones with major landscape emergencies. One is the coastal area with terraced vineyards, while another is the one inland from the coast where arable crops are found. But the zone where the land uses at greatest risk of disappearance are concentrated is, without doubt, the southern part of the study area, around Ceramida (in the municipality of Bagnara Calabra), in which a highly fragmented mosaic still exists,

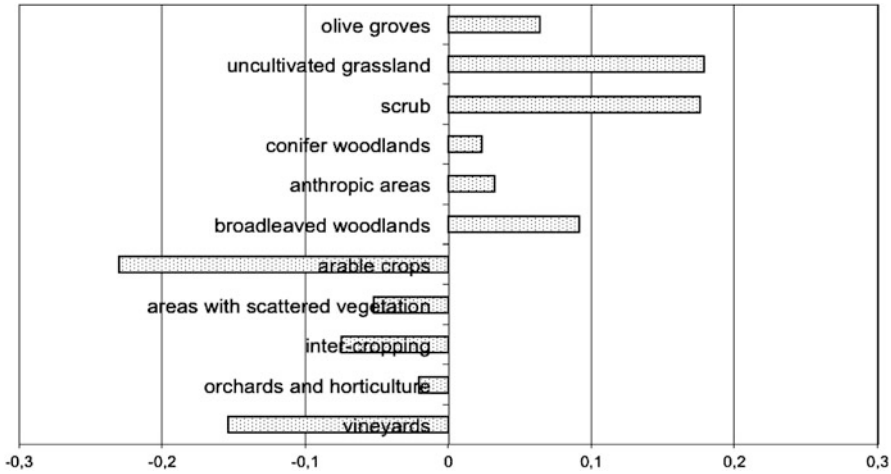

Fig. 2.25 Sharpe's Index for the period 1954–2007

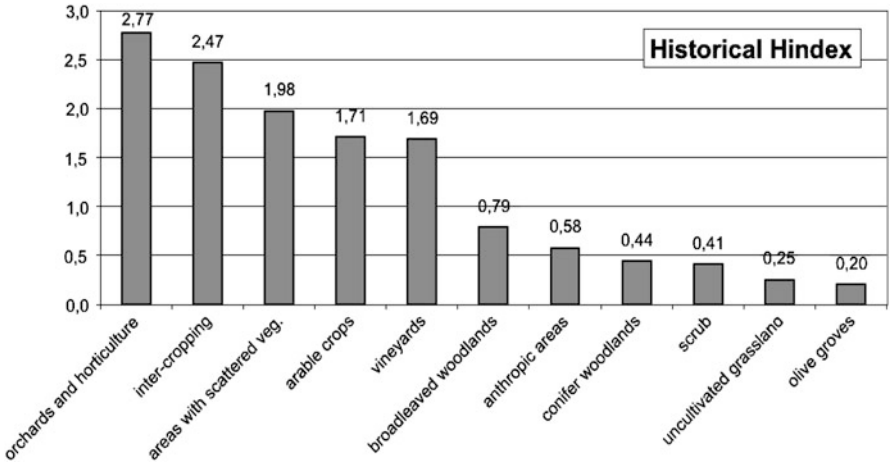

Fig. 2.26 Historical Index values for the various land uses (Costa Viola)

with horticulture, inter-cropping and vineyards. The areas with scattered vegetation should not be considered a characteristic land use at risk of disappearance, but rather as the first sign of the abandoning of farming activities.

2.3.6 Discussion of the Results

The Costa Viola landscape stills retains part of the characteristic elements of the historical systems with an integrity that is still generally good, with steep sea cliffs

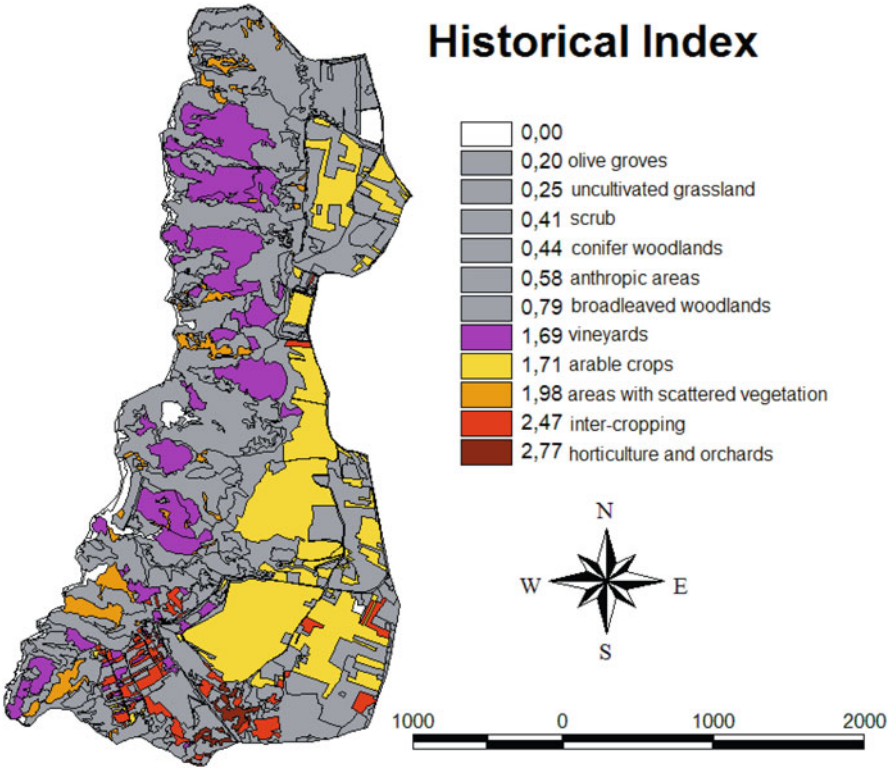

Fig. 2.27 Historical Index for the period 1954–2007 (Costa Viola)

intricately terraced and cultivated with vines, the hinterland with widespread arable crops, and the south with a complex mosaic of small areas cultivated with horticultural produce and inter-cropping.

Even if all these elements still persist, the multi-tem poral analysis and calculation of Sharpe's Index and the Historical Index have demonstrated the true magnitude of the abandoning of farming activities, the principal cause of vulnerability of the local historical landscape, which is more critical among the traditional land uses (arable crops, vineyards and inter-cropping). In particular, in the absence of a stable market that guarantees a suitable distribution network for the local wines and satisfactory income for the producers, the gradual abandoning of the vineyards is inevitable, because they are grown almost exclusively on small terraces on steep slopes, and are therefore labour-intensive and difficult to mechanize.

In order to preserve the historical landscape of Costa Viola it is therefore necessary to develop projects and policies in support of the traditional farming activities, in particular viticulture, the conservation of which, being linked to the maintenance of the terraces, has an importance that goes well beyond just the conservation of an aesthetic and cultural heritage. Indeed, the terraces are a defence against surface

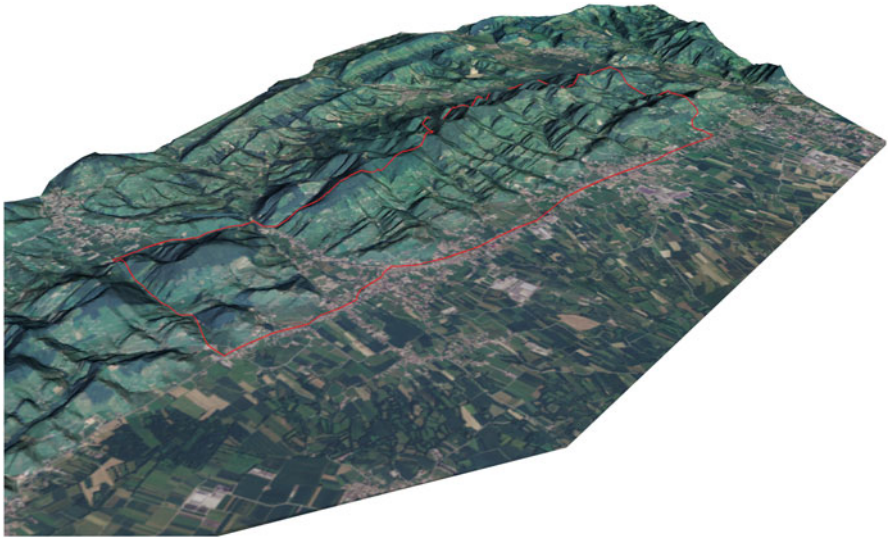

Fig. 2.28 The study area of Valdobbiadene on a 3D model terrain

erosion and landslides, phenomena that can also be dangerous for humans, given that there are beaches and a stretch of the coastal railway line that runs past the foot of the steep cliff. Where the vineyards are being abandoned and stone walls less maintained, landslides are frequent and are now one of the main problems of the entire Costa Viola, also outside the study area (Nicolosi and Cambareri 2007).

The case of Costa Viola is therefore emblematic of the close correlation of the abandoning of farming activities, the need for markets that support the typical local products and conservation of the traditional landscape with the need to protect the territory against landslides and erosion.

2.4 The Valdobbiadene Study Area (Veneto)

The study area is in the territories of the municipalities of Farra di Soligo and Valdobbiadene, in the Province of Treviso, and extends for around 1152 ha. It is an area of very closely spaced ridges lying in an east-west direction at the northern limit of the Treviso plain, with an elevation of between 130 and 350 m a.s.l. (Fig. 2.28).

The geological substrate is composed of polygenic conglomerates with thick beds of pebbles alternating with narrow marl-clay lentils in the hills furthest south; moving northwards the hills are of marl clays, sandy clays or sands with stony layers, while the most northerly ridges are formed by molasses, marls and grey-green marl clays.

For technical reasons the first date chosen for the multi-temporal comparison is 1960, as the detail in the 1954 aerial photos was insufficient because of a high flight altitude.

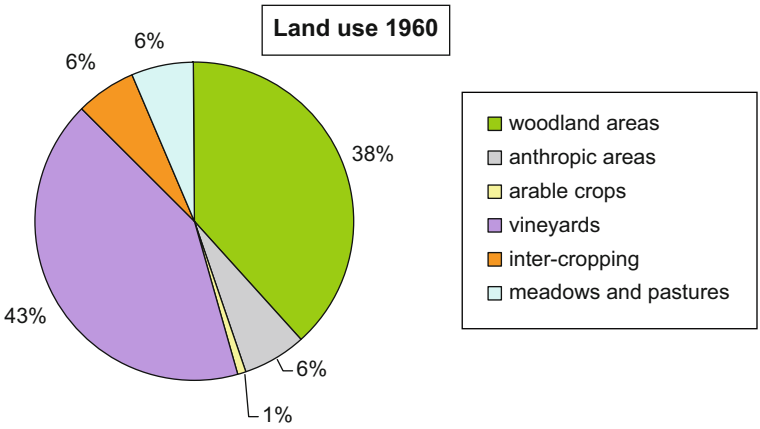

Fig. 2.29 Percentages of land use cover for 1960 (Valdobbiadene)

2.4.1 The Landscape in 1960

The landscape of the Valdobbiadene hills in 1960 (Fig. 2.29) is dominated by two types of land use, vineyards and woodlands, which cover 43 and 38 % of the study area respectively. These are followed by meadows and pastures, inter-cropped areas and anthropic areas, each one on 6 % of the surface area. Arable crops are instead only found on 1 % of the area, so they are not a characteristic land use.

The main type of vineyard are those planted following the contours (Table 2.9), which represent 97 % of this land use, and are traditionally grown on earth terraces on very steeply sloping land, which would otherwise be impossible to cultivate. The few vineyards with longitudinal rows are mainly concentrated in the flatter part of the study area.

The most widespread type of woodland is that of broadleaved woodlands (97 % of the wooded areas), whereas scrub and mixed woodlands are sporadic.

The meadow and pasture areas are important, both open and treed, which form a belt that runs in a south-west north-east direction in the part of the study area at higher altitude, where the livestock were probably taken to graze in the summer.

Among the farming areas, apart from vineyards, the most common land use is that of arable crops with vines, a traditional type of inter-cropping practised in the valley bottoms and on the plain, followed by treed arable crops and orchards. Arable crops are only found in small areas on the plain.

The layout of the land uses in 1960 (Fig. 2.30) is closely correlated to the morphology of the territory; the pastures and meadows and some woodland formations are at the highest altitudes, while the anthropic areas and different types of farmland are to be found in the flatter zone. The intermediate band, characterized by

Table 2.9 Land use classification for 1960 (Valdobbiadene)

Land use 1960	Area (ha)	Percentage
Scrub	11.58	1.00
Anthropic areas	52.17	4.53
Broadleaved woodlands	426.83	37.05
Mixed woodlands	2.45	0.21
Orchards	13.07	1.13
Pasture	1.10	0.10
Treed pasture	48.97	4.25
Meadows	19.84	1.72
Meadow treed	3.75	0.33
Roads	22.14	1.92
Treed arable crops	16.71	1.45
Arable crops	10.38	0.90
Arable crops with vines	41.40	3.59
Contoured vineyards	467.85	40.61
Longitudinal vineyards	13.78	1.20
Total	*1152.04*	*100.00*

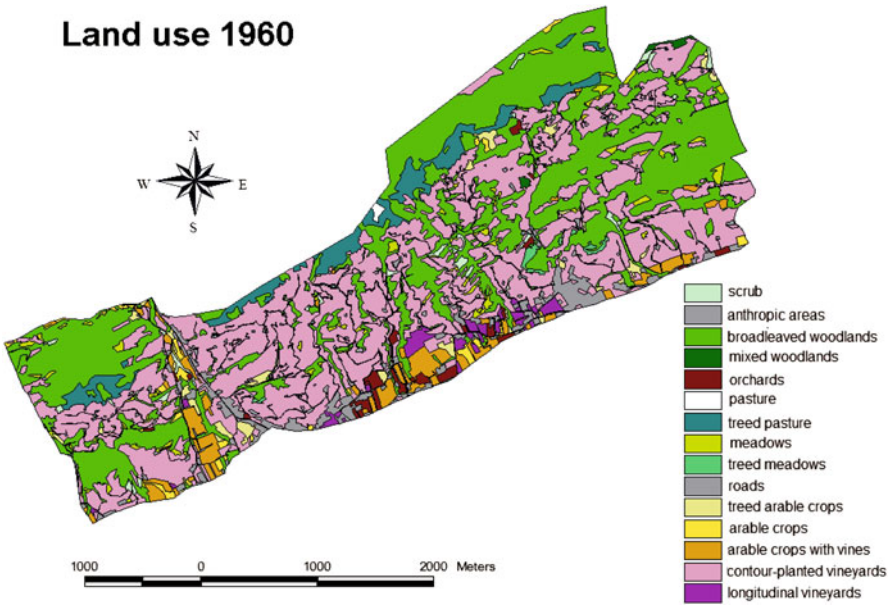

Fig. 2.30 Map of the land uses in 1960 (Valdobbiadene)

low but steep hills, is divided between traditional contour-planted vineyards on the south-facing slopes, and small woodlands on the north-facing slopes and in the small valleys between the hills.

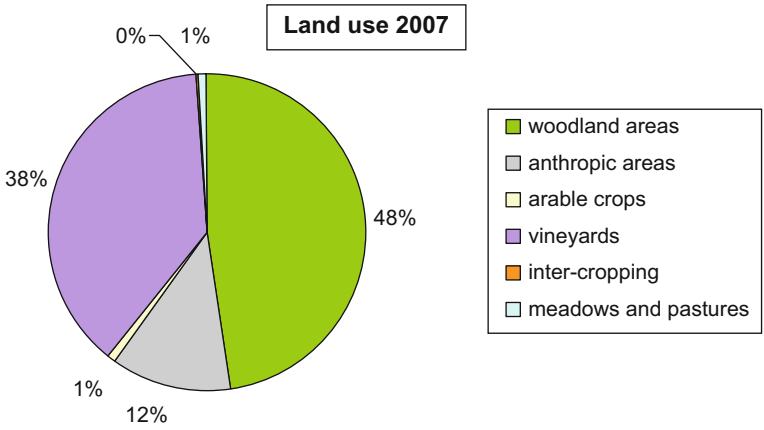

Fig. 2.31 Percentages of land use cover for 2007 (Valdobbiadene)

Table 2.10 Land use classification for 2007 (Valdobbiadene)

Land use 2007	Area (ha)	Percentage
Scrub	8.99	0.78
Anthropic areas	115.61	10.04
Broadleaved woodlands	535.72	46.50
Mixed woodlands	3.68	0.32
Horticulture	0.30	0.03
Meadows	8.94	0.78
Roads	25.02	2.17
Arable crops	7.11	0.62
Arable crops with vines	3.66	0.32
Contoured vineyard	413.06	35.85
Longitudinal vineyard	29.94	2.60
Total	*1152.04*	*100.00*

2.4.2 Today's Landscape

The landscape in 2007 continues to be dominated by vineyards and woodlands, but the ratios have changed, and other land uses have markedly increased to the detriment of some traditional crops (Fig. 2.31). Wooded areas have become the most common land use classes (48 % of the surface area), while vineyards cover 38 %. Among the other land uses the only type with a significant expanse are anthropic areas (12 %), while meadows and pastures, arable crops and inter-cropping together total only 2 % of the study area.

Broadleaved woodlands are still the most widespread type of wooded area, covering 46.5 % of the study area (97.7 % of the forest areas), followed by scrub and mixed woodlands (Table 2.10).

Traditional contour-planted vineyards are still the most widespread type (93 % of the vineyards), but there is a tendency towards an increase of the layouts in longitudinal rows and a regression of those contoured with respect to 1960.

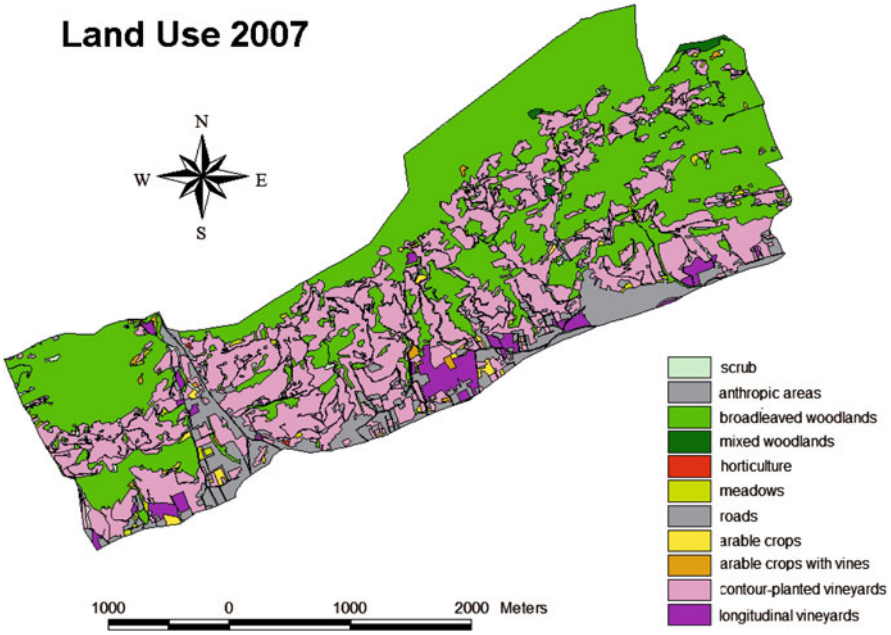

Fig. 2.32 Map of the land uses in 2007 (Valdobbiadene)

The arable crops remain almost unaltered, with only a slight reduction, while open areas (meadows and pastures) and inter-cropping have practically disappeared, with obvious negative effects on the landscape quality, in that they were the land uses that characterized the zones at higher and lower altitudes, respectively. The map of land uses in 2007 (Fig. 2.32) shows that there has been a simplification of the landscape at the highest and lowest altitudes. In the former, woodlands have colonized the abandoned pastures and meadows, while on the plain the advance of urban areas united with the planting of new specialized vineyards, has eliminated almost all the inter-cropping from the landscape mosaic. The central belt is still dominated by contour-planted vineyards and by wooded areas, which have anyway spread.

2.4.3 Landscape Changes in the Period 1960–2007

The principal characteristics of the traditional Valdobbiadene landscape have remained almost intact over the last 50 years, even if there have been changes to land use and the structure of the landscape mosaic. Although there are no significant changes on 75 % of the study area, there are important dynamics (Fig. 2.33), like forestation on 12 % of the area, followed by urbanization (on 6 %), intensification (4 %), deforestation (2 %) and extensification (1 %).

Forestation is a process that for 44 % affects open spaces, like meadows and pastures, treed and not, land uses that were to be found at the highest altitudes, which

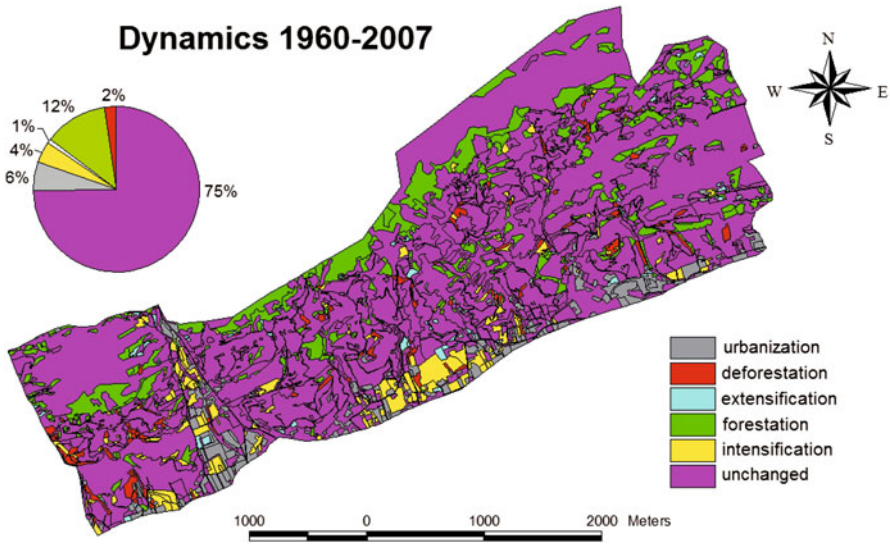

Fig. 2.33 Map and percentages of the principal evolutionary dynamics for the period 1960–2007 (Valdobbiadene)

Table 2.11 Cross tabulation of the evolutionary dynamics during the period 1960–2007 (Valdobbiadene)

	Land use 2007											
Land use 1960	scrub	anthropic areas	broadleaved woodlands	mixed woodlands	horticulture	meadows	roads	arable crops	arable crops with vines	contoured vineyard	longitudinal vineyard	**Total**
scrub	1.65	0.22	7.47			0.51	0.02	0.33	0.04	1.08	0.25	11.58
anthropic areas		51.52								0.60	0.05	52.17
broadleaved woodlands	2.48	9.80	390.95			1.03	0.46	0.46	0.52	19.73	1.39	426.83
mixed woodlands				2.45								2.45
orchards	0.07	3.93	0.40				0.21	0.24	0.76	5.63	1.82	13.07
pasture			1.10									1.10
treed pasture	0.20		47.68	0.55		0.06			0.28	0.19		48.97
meadows	0.24	0.48	10.42			1.06	0.05	0.46		6.41	0.73	19.85
treed meadows	0.32	0.19	2.39			0.24	0.08	0.04		0.50		3.75
roads		0.09					22.05			0.00		22.14
treed arable crops	0.09	4.68	4.12			0.27		0.08		5.52	1.96	16.71
arable crops	0.09	2.44	2.33			0.12	0.09	2.14		2.57	0.60	10.38
arable crops with vines	0.19	15.69	1.77			0.83	0.01	1.83	0.43	9.96	10.70	41.40
contoured vineyards	3.66	23.16	67.09	0.68	0.30	4.73	2.04	1.48	1.64	355.69	7.39	467.85
longitudinal vineyards		3.41				0.09		0.05		5.18	5.05	13.78
Total	8.99	115.61	535.72	3.68	0.30	8.94	25.02	7.11	3.67	413.06	29.94	**1152.04**

no longer being used for grazing, have been gradually colonized by woodland through secondary successions, with the consequent disappearance of a characteristic element of great landscape and ecological importance (Table 2.11). 49.8 % of forestation has

involved lands that were occupied by contour-planted vineyards in 1960, the sign of a not negligible abandoning of traditional vineyards, probably those further from the roads and less remunerative.

The second dynamic in order of importance is the expansion of built-up areas on the plain, much of which is on land at one time used for inter-cropping, especially arable crops with vines, a typical land use in the area at the foot of the hills, which is now reduced to just over 3 ha, whereas there were more than 40 ha in 1960.

The arable crops with vines have also disappeared because of agricultural intensification, and their transformation into specialized vineyards; this dynamic, 94 % of which is due to the planting of new vineyards, is mainly in the areas at the foot of the hills.

Deforestation and extensification are limited to small scattered areas. However, new plantations of contoured vineyards should be pointed out, of slightly less than 20 ha, on lands that in 1960 were covered by broadleaved woodlands.

Most of the landscape is unchanged, with the best preserved part of the historical landscape being the central belt of the study area, where traditional viticulture continues to be remunerative because high quality wines are produced and it is served by a good network of roads, and where the morphology of the land makes the substitution of traditional terraced vineyards with more mechanized longitudinal rows impossible.

2.4.4 Earth Terracing

The studied territory has a morphology dominated by low but particularly steep hills. Vines have been cultivated for centuries on narrow terraces supported by earth embankments, not the more usual dry-stone walls, which allow otherwise unproductive lands to be cultivated.

The terraces are still today generally in very good condition (Figs. 2.34, 2.35), as the production of high-quality wines provides sufficient income to motivate non-mechanized cultivation and renders the maintenance of the terraces economically sustainable. Also, because of the steeply sloping hills, it is not possible to convert the traditional contoured layout with more easily mechanized layouts, as has instead happened in many parts of the country. This conversion has only occurred on fairly limited areas closer to the plain. An overall reduction of 20 % of the cultivated terraced land is reported, a value that in reality is not as high as it might seem, because the 2007 orthophotos do not show abandoned terraces invaded by shrubs or wasteland.

It can therefore be affirmed that as long as the wines produced locally command a huge and remunerative market, traditional wine-growing will not be abandoned, and the local landscape will continue to maintain its unique characteristics.

Fig. 2.34 The terraced landscape of Valdobbiadene

Fig. 2.35 The dense network of earth terraces in Valdobbiadene

Table 2.12 Indices of landscape ecology (Valdobbiadene)

	1960	2007
Number patches	904	943
Average area patch (ha)	1.27	1.22
Number land uses	15	11
Shannon's index of dominance	1.14	1.12
Hill's diversity number	4.79	3.59

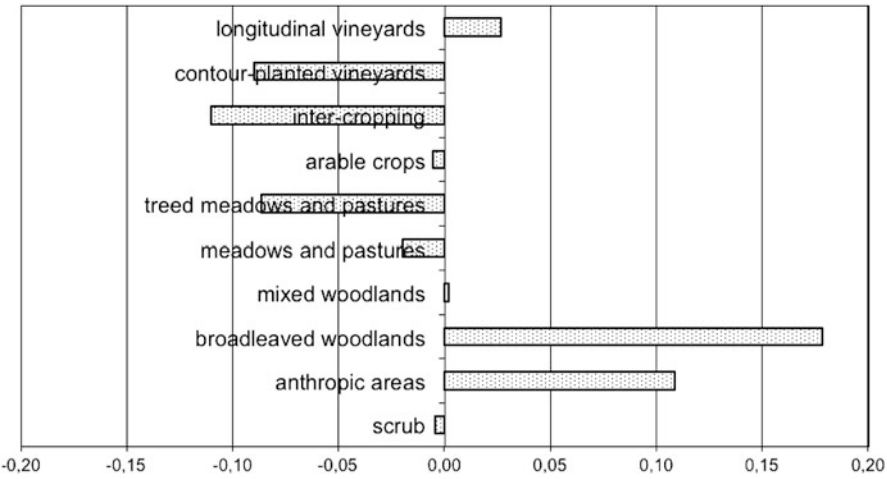

Fig. 2.36 Sharpe's Index for the period 1960–2007 (Valdobbiadene)

2.4.5 The Indexes of Landscape Ecology

The indexes of landscape ecology highlight that, despite some changes in the landscape structure and land uses, the principal characteristics of the landscape are still on the whole unaltered. The number of land uses diminishes significantly and the landscape is characterized by a greater equilibrium between the different types of land use, so presents a more simplified structure in terms of diversification, while the fragmentation level of the mosaic remains more or less unaltered (Table 2.12).

The figure relating to Sharpe's Index (Fig. 2.36) shows a notable expansion of broadleaved woodlands and anthropic areas, which corresponds to a reduction in open areas (meadows and pastures, treed and not) and inter-cropping, in particular the inter-cropping of arable crops and vines that covered more than 40 ha in 1960, and of which around 20 ha have been transformed into vineyards and other 16 ha have been lost to advancing urban areas, with the result that nowadays only 3 ha of this land use survive.

The vineyard situation is particularly interesting; Sharpe's Index demonstrates that the traditional contour-planted vineyards have had a consistent reduction, in part corresponding to an expansion of the vineyards with longitudinal rows. Even if the

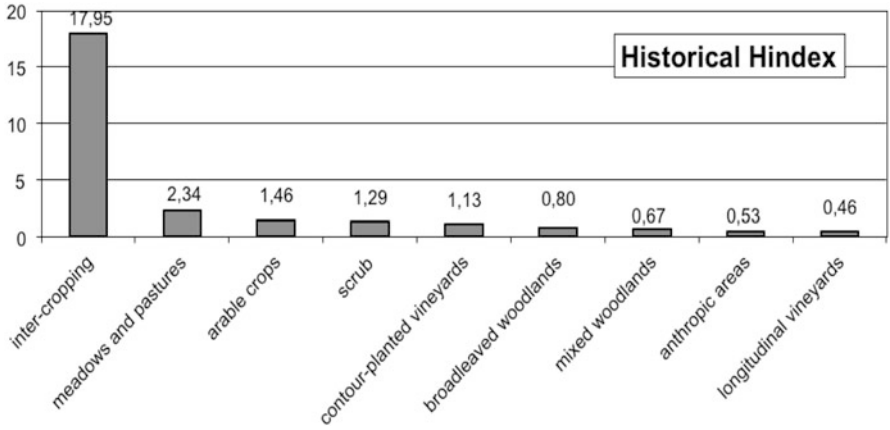

Fig. 2.37 Values of historical index for the different land uses in Valdobbiadene

Valdobbiadene landscape is still on average intact, it should not be forgotten that processes of intensification are underway in the viticulture sector, which lead to a substitution, at least on gently sloping land, of the traditional contoured layout with the more easily mechanized and profitable longitudinal layout, with a consequent and important modification of the traditional landscape systems.

According to the Historical Index (Fig. 2.37), inter-cropping is the land use type at greatest risk of disappearance from the local landscape. These different crop associations confer high diversity on the area and are an important testimony to traditional farming systems, but are now extremely scarce, with less than 4 ha, against the approximately 72 ha identified in 1960.

The second land use in order of Historical Index value are the meadows and pastures, still present today despite their strong regression due to the abandoning of livestock grazing. These are an important land use, not only for their landscape or historical-cultural role, but also because they constitute an environment with a rich floral and faunal biodiversity.

The contour-planted vineyards have seen a reduction in surface area, even if they are still widespread and typical of the hills between Tarzo and Valdobbiadene, while the vineyards with longitudinal rows have an index value of less than 1, confirming their expansion since 1960. The spread of longitudinal vineyards (that pass from 13.7 ha to around 30 ha), accompanied by the increase in average size (from 0.5 to 1.1 ha) and maximum size (from 3.5 to 12 ha), indicates a marked trend towards homogenization of the viticultural landscape, especially in the flatter areas.

The map of the Historical Index (Fig. 2.38) shows that the central part of the study area is where the main historical emergency is concentrated, linked to the vineyards traditionally laid out following the contours. In reality their disappearance does not appear likely; the majority of these lands have very steep slopes, where vineyards with longitudinal rows could not be planted, if not in a few small areas. Moreover, these vineyards produce high-quality wines, so viticulture, even if difficult to mechanize, is remunerative. On the other hand, it is also true that in the last 50 years around

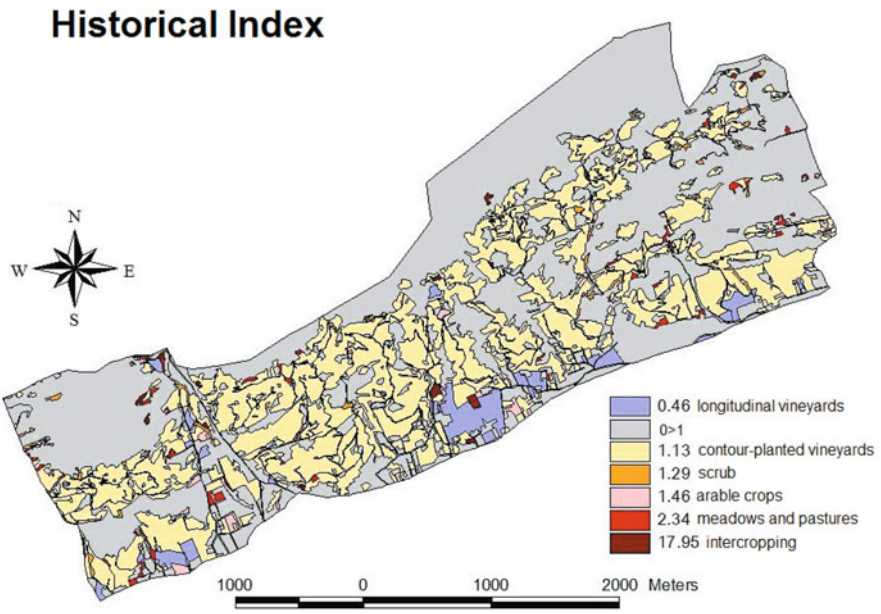

Fig. 2.38 Historical Index for the period 1960–2007. The longitudinal vineyards (IS = 0.46) are highlighted in violet to demonstrate where there has been intensification of viticulture (Valdobbiadene)

55 ha of contour-planted vineyards have been lost, in part colonized by woodland and in part transformed into longitudinal vineyards, so policies are necessary to encourage traditional viticulture and avoid further losses. The longitudinal vineyards are highlighted on the map, although the Historical Index value is less than 1, in order to show the zones where there has been an intensification of viticulture, which as would be expected correspond to the plain areas at the foot of the densely terraced hills. The areas that assume higher Historical Index values, i.e. inter-cropping, meadows and pastures, and arable crops, form small scattered patches on the territory.

2.4.6 Discussion of the Results

Although the study area has retained its principal characterizing element, i.e. contour-planted vineyards on terraces, there have also been degrading processes for the historical landscape that have led in 50 years to a simplification of the landscape mosaic, especially in the areas at higher altitude and those close to the plain.

The abandoning of pastures at higher altitudes has led to an expansion of woodland areas, and the loss of open spaces, which are important not only for the landscape but also for the conservation of biodiversity. The areas on the plain have instead been affected by urban expansion and the loss of inter-cropping, with a notable worsening of the landscape quality.

In the central altitudinal band the historical landscape has instead remained unaltered, for two reasons, one economic and one linked to the morphology. The wines produced in the Valdobbiadene area are of extremely high quality and have an international market, so, despite the high costs of cultivating the traditional vineyards, they guarantee the producers a sufficient income, even in such a technically complex situation. The second factor that has led to the continuation of vine-growing in its traditional form is the steeply sloping land, which has impeded the substitution of the contour-planted vineyards with the more easily mechanized and remunerative longitudinal vineyards, limiting this process to the flatter lands. But if the market for the local wines should disappear, the incomes would no longer be sufficient to guarantee the cultivation of traditional vineyards, and their abandoning would become inevitable.

The historical landscape therefore remains highly intact, especially in relation to other similar situations. In these contexts the principal factor for the maintenance of cultivations that are labour-intensive and difficult to mechanize, is the presence of a flourishing market for the products.

2.5 Conclusions

The aim of the results reported above has been to establish the integrity of the historical landscape in three areas surveyed for the national register of historical rural landscapes, characterized by terraced vineyards. From the analysis of the landscape dynamics, in addition to the elements mentioned in the discussions of the results of each study area, two other factors clearly emerge, common to all three situations studied. Firstly, the importance of the role of the socio-economic context, which must include a market for the local products, in maintaining the historical landscape. Indeed, this is much more vulnerable and compromised in contexts where no longer economically sustainable farming activities have been abandoned, as found for Costa Viola, but also in situations of strong intensification of the farming sector, with high-quality products and a flourishing market, as happens in many highly specialized wine-growing areas. However, the element that appears to be most at risk in all three study cases is inter-cropping, which is not easily mechanized and is linked to traditional farming that doesn't aspire to product quantity, but which constitutes an important land use for the overall quality of the landscape.

The second factor that emerges from the analysis regards the importance of terracing as a defence against surface erosion and landslides, especially on very steep slopes; in the Costa Viola area, with a reduction in the cultivation of the terraces and regular maintenance of the dry-stone walls, an increase in the number of landslides has been recorded (Nicolosi and Cambareri 2007). The role of the terraces as a protection against surface erosion and landslides cannot be ignored, especially in a context, like Italy, where much of the rural territory is considered to be at hydrogeological risk.

In the case studies, the integrity of the historical landscape can be estimated through an evaluation of the reduction of the characteristic elements of the landscape by direct analysis, which takes into account the reduction of the historical land uses and of the terracing, or in more extensive terms, the reduction of the complexity of the landscape in general, including forestry aspects, is demonstrated by the reduction in the value of Hill's Diversity Number and by the increase in Shannon's Index of Dominance. The variation of the various indices applied to the study cases, which can only be evaluated through a historical analysis of the landscape and its evolutionary dynamics, represents in itself an index of the changes of the structure of the historical landscape.

To assess the integrity of the historical landscape is necessary to investigate deeply the structure of the landscape, identifying the main features, and the changes in time at a local level. This allows the elements worth preserving to be precisely defined, so as to avoid the conservation of landscape elements discordant with the historical-cultural context. The local study of the landscape characteristics is also fundamental for territorial planning (Magnaghi 2005), especially at regional level. However, in view of the establishment of the national register of historical landscapes and traditional practices, it will be necessary to establish different categories of integrity since this study shows that even in the area considered of having a high level of integrity, there have been important changes in the original structure of the landscape. As already described in the chapter about integrity, few areas presents large homogenous historical land use structures, but rather smaller surfaces often non contiguous, or common elements, as in the case of terraces, but showing different features of crops.

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Chapter 3
The Role of Historical Rural Landscapes in Territorial Planning

Alberto Magnaghi

3.1 Foreword

My hypothesis regarding the role of historical rural landscapes is simple: from a glance at the register it is apparent that the geography of historical rural landscapes, or rather their relicts (with respect to the dominant role of the agroindustry in contemporary economies) not only refers to the remains of agricultural mosaics in a few lowland areas but also to prevalently mountainous and hilly areas in which the added value of traditional products (such as wine and oil) are still competitive with intense urbanisation and agrarian industrialisation. The geography of these areas, with particular regard to polycolture, is largely composed by derelict areas. These landscapes are destined to reinforce the core areas of regional ecological networks either through desertion and subsequent spontaneous reafforestation or because it has been decided that they should be converted into protected areas. In brief it is an *ecological way* of "selling off" historical rural landscapes of scenic interest which could be perceived as an attempt to compensate for the environmental disasters caused by contemporary urbanisation.

Neither a *restrictive regulatory approach* is feasible for the preservation of these landscapes: they are not Etruscan vases or archaeological artefacts which can be preserved in a glass case in a museum or in any kind of enclosure.

Thus, the only remaining possibility is what I would define as the *socio-cultural* approach. That is to say, a new type of rural settlement which not only implements new socio-economic goals to preserve traditional heritage but actually restores the competitive value which had been severely diminished through the diseconomies produced by the agroindustry in relation to food quality and sovereignty, the environment, landscape and so on and so forth.

With its new fields of action, territorial planning can facilitate this process.

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3.2 Territory, Environment and Landscape in Local Self-sustainable Development Strategies

I will begin with the assumption that many of the planning models which have been adopted thus far are experiencing a deep-seated crisis. Some examples of these are: those which have used territory as a technical support for economic activities (with some sort of asset to preserve as a counterbalance: a monument, a historic centre or an archaeological find), those which have treated the environment as a type of limitation (eco-compatibility) with critical cases which needed to be "safeguarded" from development (protected areas) and those which preserved landscapes in tourist areas. Agroindustrial production models too are experiencing difficulties due to the fact that agricultural land use has been completely dictated by the market and the price to pay has been the loss of the ability to reproduce productive resources (Bevilacqua 2006). Yet, another drawback to this type of model is that abandoned areas have been destined to environmental compensation.

With the structural crisis of these models, *territory, environment and landscape* (or rather, what remains of them, prevalently in marginal and peripheral areas, amidst the debris of contemporary urbanisation) once again become the *material and cultural basis* for the conception of new development models. These are considered to be sustainable and durable precisely because they find their value in each unique local heritage. Not only do they make it possible to exchange *unique goods* on the world market, they also help to create endogenous energy which can, in turn, enhance well-being and quality of life and help produce lasting wealth (Magnaghi 2010). In these socio-economic models of the future, territory, environment and landscape are once again considered as common goods which cannot be appropriated or surrendered as they are responsible for reproducing the life cycle and for producing collective wealth. They should, therefore, be subject to *collective agreements* in which all those with socio-economic interests in the matter have a real motivation for increasing the added value produced by t*erritory, environment* and *landscape.* From this perspective, the planning and design of territory, environment and landscape assume a central role in the definition of tools, conditions and resources for the *self-sustainable development* of a region and its local, territorial and urban systems.

3.3 The Planning of Open Spaces: Towards a Bioregional Approach

In the redefinition of the fields involved in the planning process *policies regarding open space*s assume an important role. The main focus of the plan shifts from the re-equilibration of the exponential growth factors of urbanisation (services, transport, dwellings etc), to the planning of open spaces which are intended to limit and re-qualify scattered settlement models which have pervaded the entire regional territory with the "metropolis form". Some of these initiatives include preventing

improper use of agricultural land for urbanisation (land consumption), improving urban suburbs, reconnecting ecological networks, the re-equilibration of hydrographic basins, the reorganisation of polycentric urban systems, the redefining of collaborative and complementary relations between the city and the countryside (Marson 2008), closed local food, waste and energy cycles, local reorganisation of economic systems, landscape re-qualification and so on and so forth.

In the attempt to re-qualify structural factors in favour of self-sustainable development, the *planning of open spaces* assumes an all important role. This is because the process helps to re-establish a relations between the city and the rural world which, in turn, becomes instrumental if the tendency towards the degradation of urban, metropolitan, environmental and landscape systems is to be inverted. The act of restoring *planning and morphogenetic strength* to open spaces also activates the transformation process from metropolitan regions towards "urban bioregions"(Magnaghi and Fanfani 2010). Through this transformation, the marginal and peripheral areas, as well as the deep valley systems which historically contribute to the identity of urban lowland systems, reacquire a central role in guaranteeing the reorganisation of non-hierarchical reciprocal relations between urban systems and open spaces which are characterised by agroforestry in order to create new ecosystem, energy, food and functional balances.

Using the newly acquired centrality of marginal and peripheral areas as a starting point when considering contemporary urbanisation in terms of an "urban region" in its "bioregional" role helps planning imagination to redefine the question of growth as a question of exploration and a measurement of the relationships between human settlements and environment within the region. In this way the principles of the *bioeconomy* (Georgescu-Roegen 1966) and of *systemic and fair economics* (Bonaiuti 2004) are activated and settlement principles are directed towards the "self-reproducibility of the territorial ecosystem"(Saragosa 2005).

The scenario of this new "city-country agreement" portrays a territorial organisation which is capable of *reproducing its own life cycle in a balanced manner,* raising both urban and territorial standards of living and harmonising their productive, social, environmental, cultural and aesthetic factors in order to produce lasting wealth.

3.4 The Great Invariants in Planning the Open Spaces of a Bioregion

As well as the fulfilment of urban planning requirements relating to polycentrism and to the unique identity of human settlements and urban systems, the planning of a bioregion also necessitates the implementation of a number of environmental requirements which help to guarantee its *reproducibility* (self-sustainability). In a planning model which separates the structural-statutory part from the strategic part of the plan[1] whilst putting the former before the latter, the role of "structural invariants"

[1] See for instance Law 1/2005 of Tuscany Region on territorial government.

which relate to open spaces is of the utmost importance. These are intended as *self-reproducing rules* which relate to long-standing environmental and landscape features which constitute the bioregion itself. For the most part, these rules refer to: *the balance of the hydrographic basin, the continuity of the regional ecological network, the quality of a landscape, the multifunctional performance of agriculture*.

It is no mere coincidence that these rules had already been wisely incorporated in the historical rural landscapes.

3.4.1 The Balance of the Hydrographic Basin

Most of the hydraulic deterioration and pollution in river systems is due to a lack of rules as *preconditions* which refer to *the entire basin*, the self-reproduction of the water cycle in relation to the different types of land use (resources/exploitation ratio). In socio-economic and territorial planning, economic choices have generally been favoured and overemphasised. The fate of rivers and hydrographic basins has depended on the *sum* of sectoral actions: economic, industrial, infrastructural, constructional and so on.

If these trends are to be inverted, the hydrographic basin plan will have to apply an integrated action plan to the entire basin. Particular attention should be paid to sub-basins in the hills and mountains. An effort must be made to overcome the idea of a sectoral territorial plan or water works emergency response plan (PAI- Watershed Management Plan). The plan must assume the mandatory role of a *structural invariant* when compared to various levels of territorial management plans.

The hydrographic basin constitutes the first geographical environment in which to establish the balance of resources which are essential for the reproduction of life ("the valley section" by Patrick Geddes, Zuccagni Orlandini's geographical units, Giorgio Nebbia's wide administrative areas. If this primary function were to be recognised in planning, it would strengthen the basin's territory and consider it as an entity with its own physiography, identity, settlements, production, administration and politics. This would also help to recreate valley communities and those of coastal hinterland areas, to reconsider lowland cities as the "outposts"of the agroforestry systems in the valley which they once represented. This, in turn, would recreate a collaborative network linking mountains, lowlands and the sea.

3.4.2 The Continuity of the Ecological Network

The Network must guarantee the ecosystemic continuity of *regional territory in its entirety* at all levels. With its structuring ability, it contributes to the determination of the rules and performance of the settlement type. It defines the limits and boundaries of the built environment. The integrated treatment (ecological, landscape and fruitive) of ecological corridors would make it possible to avoid the closure or obstruction of

the remaining environmental gateways, revitalising urban planning regulations by discouraging or stopping land consumption.

Therefore, the statutory part of the plan which refers to the ecological network should adopt it as a set of rules relating to all regional territory, including agricultural, woodland and farming territory with the complex eco-mosaics of traditional agriculture as the core areas and the remaining historical agricultural patches as the "secondary ecological network".

3.4.3 Landscape Quality

From a brief glance at the European Landscape Convention and at the Cultural Heritage and Lanscape Code, it is apparent that landscape can no longer be defined as the object of sectoral policies. Indeed, it must be treated, both in the survey and planning stages, as a holistic synthesis of all the elements which go to create the overall identity of a place at a local, regional and national level. In this sense, landscape quality objectives emerge as great statutory invariants which condition sectoral and specific choices, especially when it comes to redefining the multifunctional role of open spaces. This role is made effective by the fact that (in accordance with art 143 and subsequent amendments of the code), unlike sectoral and urban plans, the *landscape plan* assumes a *mandatory role* upon sector and land-use plans. What is more, given that the landscape plan divides *all regional territory into zones*, including urban areas, this allows for the activation of projects and policies which not only preserve and enhance outstanding territorial areas, but also requalify and reconstruct degraded landscapes, amongst which, usually because they have been abandoned, historical rural landscapes are usually found.

3.4.4 The Multifunctional Performance of Agriculture

Presented in this way, in order to be implemented, the entire planning process must make the multifunctionality of agriculture its focal point. It should be seen as " *the sum of contributions that the agricultural sector can make to collective social and economic well-being and the acknowledgement it receives for doing so*[2]".

This requirement has already been met in the evolution of the natural park into the agricultural park[3]. This is seen as a place to experiment with new productive, environmental and fruitive relations between the city and the rural world. It is capable of

[2] Idda L et al. (2005) (Journal of Agricultural Economics).

[3] The concept of an agricultural park whose basic role is to design agroforest areas with multisectoral functions, was developed at the intersection between two different territorial typologies: the peri-urban area whose inhabitants express a strong demand for new rurality (recreation, food, environmental and landscape quality) and the rural environment which is undergoing an extreme transformation towards multifunctionality.

restoring the latter with a new kind of central role in terms of economy, production, landscape, recreation, culture and society. The new role which the rural world plays in creating development quality can be conceived using new *productive multifunctional* objectives as a starting point. These should become socially recognised and economically re-evaluated according to the quality of the specific features of the product and the spatial and social context (Magnaghi and Fanfani 2010; Ferraresi 2009).

In this perspective, the regeneration of the value and meaning of rural territory (and of its subjects, farmers) as a "place" which actively develops the idea of landscape and environmental quality, safeguards hydrogeology, encourages short networks between production and consumption (Calori 2009) and enhances standard of living (in particular in degraded peri-urban areas), serves as the basis for the re-constitution of a new balance as well as a new dynamic and communicative city-country alliance (Fanfani 2009).

With these outcomes in mind, *rural development programmes* can go beyond their sectoral dimension and become (through the strategic application of *conditionalities*) integrated tools for the planning of open spaces helping to determine the structural invariants which make up the urban bioregion.

In this perspective, both farm businesses plans and rural development plans are organised in such a way that as well as producing *market goods* (Food and Energy), farmers also produce *public goods and services* which are remunerated as such. This evolution can be encouraged both by European policies on the subject of decoupling (founding limited to quality production) and by the new environmental and landscape functions which have been attributed to agriculture in rural development programmes.

3.5 Historic Rural Landscapes: From Conservation to Valorisation

So what role can historical rural landscapes of scenic interest play in relation to these new planning fields?

They constitute a *cultural wealth* of "sapient" rules for producing territory, for the independent regeneration of productive resources and for the strengthening of regional identities (Agnoletti 2009). Applying these rules to "territorial statutes" can help overcome the diseconomies of current agroindustrial models. Historic rural landscapes can constitute the heritage basis on which to found multifunctional agricultural parks, both concerning the *enhancement* of agricultural areas of great value and the *requalification* of urban and metropolitan areas towards the idea of an urban bioregion.

But what kind of patrimony are we dealing with considering the problems mentioned in the previous paragraphs?

Amongst the features which characterise traditional agriculture (Cevasco 2007) we can find many of the elements which are required for bioregional planning:

- self-production, which is not dependent on the market, of the system's reproductive resources ("peasant mode of production", van der Ploeg 2008);
- the production of ecological complexity, starting with the complexity of polyculture ecosystems, the enhancement of local environmental resources which are essential for the self-reproduction of productive resources;[4]
- hydrogeological safeguarding: taking care of woodlands, terracings and torrents;[5]
- closed local environmental cycles: food (short production-consumption networks); waste (harmonious breeding-cultivation balance), water (low energy crops; traditional cultivation methods which relate to climatic features and to local rainfall patterns);
- typical products in typical landscapes, food quality[6];
- the cultural identity of places: the presence of mutual aid and of solidarity through non-monetary exchanges which are typical of community relations in civic practices.

3.6 Neo-rurality and Rural Repopulation

Innovation can be selectively drawn from the elements which characterise the multifunctionality of historical rural landscapes. Traditional knowledge and expertise can be combined to obtain an appropriate use of technologies. In this way, the overall productivity of the system can outweigh the diseconomies and imbalances of the agroindustrial system. It is therefore necessary to encourage the restoration of peasant production methods, small family businesses, cooperatives and community initiatives which can repopulate historical rural landscapes with innovative forms of retro-innovation (Marsden et al. 2002).

Territorial planning can help to promote this process by helping the weaker local actors both in mountainous and hilly areas and in peri-urban agricultural contexts to make the most of the heritage potential of their territory.

In this scenario there are resources of "innovation" and "contradiction": we can catch a glimpse of these strengths both in form of peasant resistence (Carrosio 2009) and in the processes of "repeasantization" generated by the crisis experienced by metropolitan life models (return migration, shrewd agricultural neo-entrepreneurship) in the sense that traditional forms of agriculture have been resumed both regarding the productivity and the multifunctionality of agriculture with the transformation of traditional businesses into ecological ones. These new forms of rurality, which allude to a generation of "new farmers" of ethical importance

[4] The ecological value of agricultural, woodland, and farming areas is often higher than that of areas of "renaturation"; hence the remains of agricultural mosaics and traditional crops have a connective value and act as stepping stones (hedges, plantations, the complexity of land use, the density of the mosaics as an element of biodiversity: irrigation canals, riparian vegetation in rivers and torrents).

[5] Essential specifications for integrated basin plans;

[6] The founding elements of the increasing demand for food safety and quality, not to mention landscape quality.

(Magnaghi 2010) can be identified by their ways of production and socio-technical cooperation methods, by the new role small family businesses play in the reorganisation of international trade (Sachs and Santarius 2007), by episodes of rural communities rebirth (Berry 1996), by the growth of short production-distribution chains[7], by the creation of peri-urban vegetable gardens and local farmers' markets, by processes for the reduction of external input (sowing seed, cultivar, machinery, chemical agents, technical and financial flows) both in Europe (van der Ploeg 2008; Carrosio 2005) and especially in the experiences of communitarian democracy of the indigenous peoples of Latin America (Le Bot 2008).

Unlike the industrial society in the lowlands which we hail from, the agro-tertiary society of the future, which has given rise to the creation of a new civilisation in hilly, mountainous and hinterland coastal areas, interprets the socially and culturally central role of the new farmer. This actor is someone who produces goods and services in an educated, cosmopolitan way for the entire bioregion, its citizens and for collective well-being using traditional rural landscapes as his source of cultural nourishment.

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[7] "From the relationship between "new agriculture" and economic solidarity Networks new models of social cohesion which can help to start transformation processes on a local level which, in turn, give rise to innovative services which act as a response to the degradation of community life which we are not only experiencing in the suburbs or in mountainous hilltop areas, but also in metropolises themselves" (Biolghini 2007)

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Chapter 4
Rural Landscapes: The Historical Roots of Biodiversity

Roberta Cevasco and Diego Moreno

From the point of view of historical ecology, the biodiversity of rural landscapes is revealed especially when their individual historical dimension is explored directly in the field (Rackham 1980, 1986; Moreno 1990). A historical perspective can recognize the environmental systems and processes that shape each rural landscape as true functional nodes—or, rather, "areas"—in a more general historical process of "environmental biodiversification" (Ingold et al. 2003; Cevasco 2007). Obviously, under adequate conditions of efficiency, agrarian landscapes can play a direct role in the preservation of "agricultural biodiversity". It is less well-known, however, that by reconstructing the historical role of agricultural, silvicultural and zootechnic practices in local processes of biodiversification we can, even today, mobilize an even vaster resource-pool of "Rural Landscapes of Historical Interest" (RLHI), which constitute a potential resource for the providing of new services in the field of biodiversity. Today RLHIs are largely fragmented and their productive efficiency is only partial, they have been deprived of their scenic qualities and are confined within local systems often regarded as economically marginal. Such is the situation for RLHIs in several Italian regions. They hence require specific agricultural policies (Agnoletti 2006)—which so far have been lacking—recognizing and promoting the "positive externality" or "added value" coupled with local production systems, as well as the practices and contextual knowledge of the producers who are presently managing them (Magnaghi 2007).

Let us look, in a very broad perspective, at the processes that controlled the genetic heritage of the vegetable and animal resources employed in historical agriculture, from those enacted in the early stages of domestication to the mass selection of

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domesticated breeds and local cultivars. During the 8,000 years that saw the rise and evolution of agriculture in southern Europe, these processes of agricultural biodiversification were only made possible in the context of well-defined reorganizations of geographical spaces. Once recognized, any such space could already be defined as a "rural landscape" today; rural, but not agricultural. We do not use this distinction here to contrast these earlier landscapes with the Neolithic settlements, although some urban function can be detected since 5–6 millennium B.C. Cities only appears in Italy from the second millennium B.C. onward (as is well-known, Emilio Sereni's view that the history of agrarian landscapes in Italy only begins with the Greek colonies of the iron age has long proved untenable). We use it because these landscapes are the result of manipulations that often precede the actual "agrarization" of economies. At any rate, they are "cultural landscapes", shaped by productive systems in the context of Paleolithic and Mesolithic foraging economies with a more or less continuous history. In these landscapes, the controlling of animal populations and the use of fire had such vast effects on land, the vegetable cover and the fauna that they have been recorded at the continental geographical scale. The most interesting documents in this regard come from sites in Australia and North Africa where sedimentary evidence allowed the construction of pollen rainfall diagrams whose trends were combined with a count of micro-charcoals deposited in the sediments. It was thus possible to keep track of variations determined by the use of occupational fire, giving rise locally to "occupational fire landscapes", over 40,000-year-long sequences. Studies in paleoecology and prehistoric ecology are revealing increasing evidence of similar processes in the geographical spaces we are concerned with here.

It is worth mentioning that the few available studies of the micromorphology of soils at sites on the northern Apennines that yielded Paleolithic materials have established that no soils from that period were preserved, since the analyzed pedologic profiles appear to have been truncated by ancient erosion (Macphail 1992; Macphail et al. 2009). In the not many cases where radioisotopic dates are available, the soil presently occupied by cultivated chestnut groves (today largely abandoned) appears to have formed only in the Middle Ages, or even later. Other recent investigations in the environmental archaeology of wetlands traced the watering holes from which peat deposits originated to Copper Age pasture occupation/reproduction fires (ca. 3000 B.C.). The importance of these peat bogs—today more commonly classified as "natural" heritage—for biodiversity can hardly be overestimated. Different uses were then found for these resources until the Middle Ages and beyond, when the water resources of whole Apennines and Alpine valleys were organized within well-defined "water perimeters". Even today, these perimeters reflect the topographical distribution of customary rights of access to water.

Ever since the 1980s, a curve of biodiversity of European agriculture has been recognized, from the prehistoric and protohistoric phases of domestication through the development of the dominant European agricultural systems, until its vertical fall with the rise of the industrial agricultures of the past century. As we hinted above, these are generic historical reconstructions. In abstract terms, the biodiversity of animal production systems becomes equal to zero when the cloning techniques evolved in the 1990s are applied.

In reconstructing the history of the management of genetic heritage, little attention has been devoted to the specific local environmental conditions in which biodiversification processes occurred. This neglect is largely due to a still widespread geographical notion of "landscape" based on the opposition of the "agricultural" to the "natural" landscape. Thus, even in recent historical and archaeological reconstructions one finds references to the general favorable climatic and environmental conditions of the great "diffusion centers" of cultivation biodiversity (a classical example is the "fertile Crescent"), and to general processes of "Neolithization" or "agrarization" that according to these studies determined 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. We know, instead, that the genetic history of domesticated plants went on, as new local breeds and varieties were selected and modified, and others were lost. Today, genomics will probably enable us to explore this history with unprecedented spatial and temporal accuracy, and, thus, also at the historical scale. Promising results can be expected, in particular, from paleoecological investigations based on techniques for the extraction of nucleic acids. These can be applied, for example, to the study of bone remains and other archaeological traces of domestic and wild animal populations, and the products thereof, expanding the potential of conventional archaeozoological sources. This is an important step towards the high temporal and spatial resolutions required for explorations of historical biodiversity.

The issue as presented so far may seem merely one of scientific knowledge, the developing of new instruments and methods for rural archaeology. Actually, these advancements are already finding practical application in the management of rural landscapes of historical interest; for example, in cases where, to restore and conserve the biodiversity of mountain livestock, the historical roots of local biodiversity are traced and compared with the current biodiversity in specific sectors of the mountains and their rural landscapes (Loszach et al. 2008; Cevasco 2009).

Indeed, only high-resolution investigations—based especially on the evidence recently produced by rural and environmental archaeology (Moreno and Montanari 2008)—have managed to yield detailed historical reconstructions, if not of the history of the forms of rural landscapes, at least of that of the activities that shaped them. So far, the agricultures of mountainous areas in Europe are the best documented in this regard. Over the last few years, several projects have investigated the archaeology and history of land use in these areas, usefully complicating the bygone human geography model postulating a deterministic relationship between the peopling of mountain areas and the "natural conditions" of those same areas. Eighteenth-century agronomists found the mosaic of agricultures that preceded the unification and economic reorganization of production in the age of the Industrial Revolution to be "routinary"; trapped, that is, in a technological routine. Conversely, as a result of their spatial segregation from the industrial development of agriculture in the plains, in the nineteenth century these mountain agricultures and "pastoral ways of life" were perceived as "traditional". Even today, an ideological point of view tends to "eternalize" their condition of economic marginality, which, instead, is wholly historical and contingent. Analyzing at an adequate scale the relationship

between the production systems of mountain agricultures and local environmental resources, these systems appear to have been characterized by historical processes of "continuous domestication", as opposed to the idea of existing "uncultivated" or "natural" spaces. Although present and past observers regarded them as "natural", these spaces are actually no less domesticated, although to different degrees, than those intended for arable fields in mountain agricultures (indeed, intensive grain-growing landscapes were the main reference for the *agronomes* of the eighteenth century). In the case of "continued domestication", we are confronted with landscapes characterized by historical sequences and stratifications. They are, as we designated them above, "cultural landscapes", although today they are in a post-cultivated condition. In these landscapes, the impact of "domestication" on biodiversity has had a major influence on the present mosaic of plant and animal populations, and on soils, wetlands, etc.; in sum, on all the elements that are regarded as constituting the environmental resources of agriculture, which the still indefinite number of possible mountain agricultural systems of the past have put into play and relationship over the centuries. Descending to this scale of historical and geographical analysis, some scholars have even spoken of the existence of "individual agricultures". This approach focusing on individual agency of course is an extreme one, but has nevertheless proved useful for the historical and ethnological study of the technologies employed in European agricultures. It is true, however, that the agricultures of the pre-industrial areas are complex social facts and that the processes of environmental biodiversification we are hinting at here were conveniently defined only when their analysis shifted from the environmental effects of individual actions to those of historical agricultural practices. Like all cultural practices, productive practices have a super-individual social sanction and their historical characterization, which is technical and environmental, often reveals networks of social relations that played a decisive role in past agricultures, as regards both access to environmental resources and the localization of settlements, functional annexes and crops. Which brings us back to the issue of biodiversification. To characterize productive and cultivation practices through the stratified historical testimonies of a rural landscape, analytically distinguishing them from the ensemble of the "cultural" practices of its local actors or managers, is no easy task, nor can it be achieved without first stating a few premises. But it is only by such an analysis that the roots of historical biodiversity can be traced (Fig. 4.1).

The problem of local practices and knowledge is one of the principal nodes in the perspective of historical ecology. Its solution made it possible to shed light on the contribution of LRHIs to the general process of biodiversification. By examining the current landscape at the topographic scale at specific time intervals, taking adequate account of written sources (high resolution), it was possible, at least in a relative sense, to measure the persistence, growth and loss of local biodiversity in the spaces under investigation, as we will exemplify below. The results of these first analyses do not seem to confirm the general assumptions of landscape ecology.

Biodiversification processes today are occurring not only in conjunction with the transformation and abandonment of agricultural spaces—the two general historical phenomena informing the dynamics of contemporary agriculture. In several known

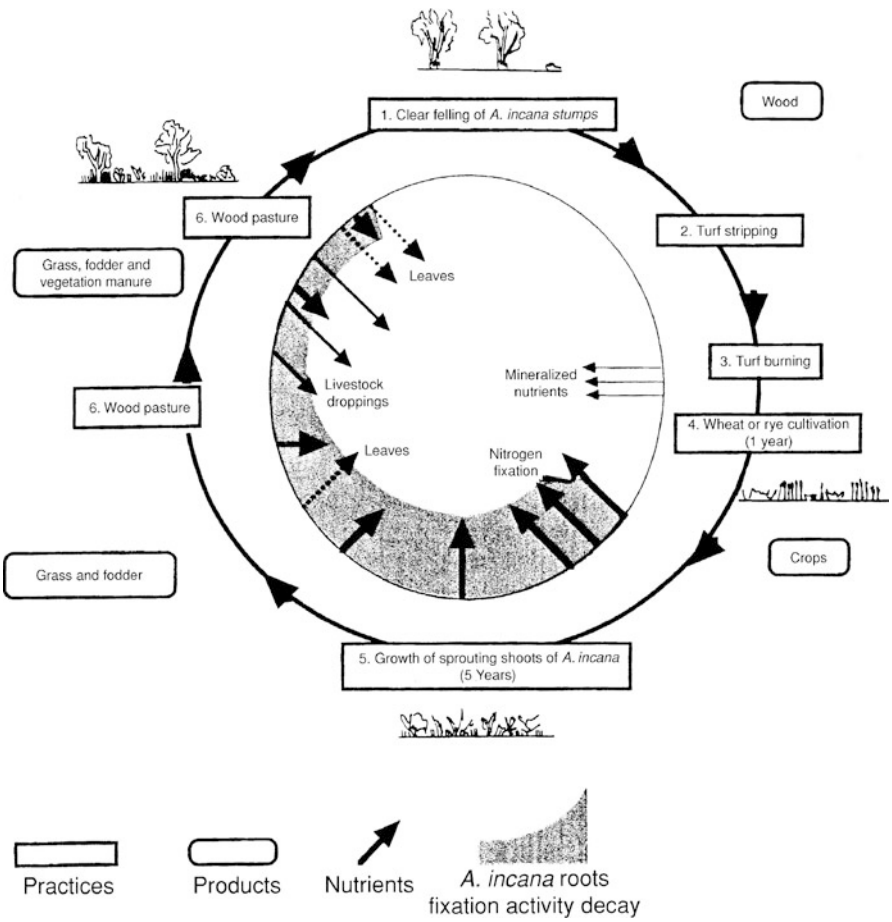

Fig. 4.1 The "alnoculture" cycle on the Ligurian-Emilian Apennines in the early nineteenth century is a typical example of the multiple systems of traditional agriculture, capable of "activating" local environmental resources and enhance biodiversity. The peculiarity of "alnoculture" was its utilization of the fertilizing properties of alder, which contains nitrogen-fixing bacteria in its root nodules

cases—for example, that of "ancient woods", they appear to be specifically connected with the local environmental-historical legacy, that is, the earlier manipulations that activated their ecological resources in the first place. Scholars have said more than once that, in the perspective of historical ecology, the vegetable component of a rural landscape, its present biodiversity, can be regarded as an artifact which, not unlike a Medieval cathedral, displays series—or, at least, traces—of historical stratifications.

A necessary premise to any analysis of the biodiversity of LRHIs, as we remarked above, is the giving up of the perspective of landscape ecology and its tenets about "naturalness". Today, the model postulating "natural" or "pristine" ecosystems is showing its limitations (Lagomarsini 2004; Cevasco 2012), not only as regards the

conservation policies it has inspired, but also in comparison with the benefits offered by "modified ecosystems" in terms of services and contribution to the establishing of new economic systems, given the enormous diffusion of rural landscapes in a post-cultivated condition. From the perspective of historical ecology, today the occupation of the biosphere is total. The activation and exchanges enacted by industrialization processes (e.g., tetraethyl lead emissions from internal combustion engines, which have been reaching the poles ever since the 1950s) are impacting the resource ecology of the whole biosphere, including protected "sanctuaries". In a global context where almost 80 % of the planet's land surface is occupied by the production and consumption landscapes of contemporary economies, over half of this surface today is abandoned, although still shaped by previous activities (Marris 2009). This part comprises the most diverse landscapes, of which no register, of course, has ever been drawn up: fragmented forests in which populations of tree species from other continents are expanding, reforested areas, abandoned and deteriorating fields and pastures which only now are beginning to earn recognition as "new ecosystems" whose dynamics are determined by their historical condition. Having dropped the perspective of alteration or deterioration, we can now describe these landscapes in their actual historical production stage. As ecologists begin to take a renewed interest in the study of these systems, at once non-natural and not cultivated, we need to define the possible role of LRHIs as spaces or nodes for biodiversification.

Ancient woodland is one of the most interesting examples of the problem of managing historical biodiversity (Watkins 1990). We will look at the example of Great Britain, since the issue is just beginning to be addressed in Italy, and in our catalogue we have only been able to report some potentially interesting cases. The issue of a National Catalogue of ancient British woodland presented itself ever since the late 1980s. Today several lists exist, managed both by the Ministry of Agriculture and by that of the Environment. These lists enumerate over 20,000 sites of ancient woods with a minimum surface of 2 ha. Fragmented and reduced surfaces—less than a hectare—are also included in the catalogue for their environmental interest as testimonies of ongoing processes of biodiversification. M.D. Hooper's investigations on the biodiversity of ancient hedges provided, as early as the 1970s, an extraordinary illustration of the direct relationship between variations in the specific composition of plant communities and the flowing of historical time. The correlation proved so strong as to allow the dating of each individual hedge on the basis of the number of species it contained (AA VV 1971; Fig. 4.2).

To assess and promote the new role of the LRHIs, we also need to transcend the notion of landscape as monument, with its emphasis on the visual element on which Italian legislation still bases their designation as heritage. A significant example of this still prevailing approach can be found in the characterization of sites in UNESCO's List of World Heritage, even when it refers to LRHIs such as the terraced vineyards of Cinque Terre.

From the perspective of biodiversification, LRHIs will be more adequately described as "living rural heritage" once a shared or clearer definition of the concept is reached in Europe. Recent proposals of the International Union of Forest Research Organizations (IUFRO) on the cultivated/cultural component of forest landscapes have contributed to clarify this concept (Agnoletti 2007).

Fig. 4.2 An Etruscan style vineyard near Naples (*upper* photo), described by Pliny the Elder in the first century A.D., showing the training of vines on poplar trees. Below a Greek style vineyard in Mozia (Sicily). Both are good examples of adaptation to different environmental conditions and biocultural diversity. The first is a traditional practice adapted to humid climates, since the vines reach high up towards the sun in order to get away from humidity of the soil, but also to scarcity of soil, allowing to have up to four crops in the same field (see the study area of Vite Maritata near Naples). The second is an adaptation to a hot, dry climate, allowing the vines to lay on the soil and take advantage of the heat incorporated into it. Both systems represent the origins of European viticulture

As we hinted above, LRHIs are recognized as historically important not only insofar as they are geographical spaces for the management of biodiversity, where local crop varieties and domestic animal breeds emarginated by the rise of agro-industrial systems are still raised, but also for the biodiversity acquired through the activation of habitats and environmental resources often regarded as semi-domestic, or even natural, as we have seen in the case of mountain agricultures. At the time of an investigation on rural landscapes of historical interest, the topographical spaces of production and activation may no longer coincide, but nevertheless still bear significant traces of their previous connections.

Today, a new historical perspective including LRHIs in its field of vision has emerged, based on the consideration that local productions, besides perennially shaping agro-silvo-pastoral landscapes, have a broader positive impact on the ecology of environmental resources insofar as they act as a "positive externality" within a *produits de terroir* economy (Moreno and Poggi 1996; Berard et al. 2005).

In the complex history of the relationship between agricultures and their environments, activation practices influenced matter and energy flows, modifying the structure of animal and plant communities and their specific composition. Memories or traces of these processes endure in the historical biodiversity of a site. Historical ecology studies and their application to the management of rural landscapes employ the most universally adopted index, that is, the number of phanerogamous species in the present populations. These studies, however, also look at vestiges or anomalous (as for example, indicator species), combining their field observation with historical sources, especially sedimentary ones (pollen, carbon, plant micro-remains, etc.), but also documentary ones such as historical plant lists or herbals, etc. (Moreno et al. 2005).

Even the simpler technologies employed in rural landscapes of historical interest, such as edible plant collecting practices (Poggi 1997) or certain forms of pasture-meadow management, besides processing plants in multiple ways to produce salad greens, edible grasses, hay or fodder, etc. (production practices), activate the whole grassy layer ad soil, encouraging the formation of microhabitats suitable for the reproduction of additional resources such us rare or protected species (e.g. orchids), edible mushrooms, and good forage species that also draw small stantial fauna: activation practices that can be described in conservation view as an environmental "added value".

An example of this are the so called "mountain meadows, rustic meadows" documented in the northern Apennines. These are actually terraced pasture meadows, partly treed with Turkey oaks (*Quercus cerris*), which their users regard as distinct from "wild" meadows, from which at any rate they derive, and which they can revert back to once grass mowing is ceased and *Onobrychis viciifolia* itself disappears. It is this leguminous forage grass that gives this whole category of pasture meadows their local name and grants them a status of "domesticity" (Cevasco 2007). The cycle of cultivation practices documented in these spaces over the last decade is centered on cattle husbandry for local dairy production, but it also activates, in the same habitats, other environmental resources that are beneficial for the local micro-economy, as well as having a positive impact on biodiversity. Domestic farm economy manage

Fig. 4.3 Prato di Curio, 1,370 m a.s.l. (surveys 1998–2003). The loss of biodiversity (orchids, genziane, arniche, good fodder species, ecc.) in an ancient grassland with the abandonment of the hay making and grazing practices. *A* = parcel still mown; *B* = parcel abandoned since about 10 years. These practices conserve not only the fodder resource but also work as activation practices with multiple effects on the biodiversity of the whole ecosystem. (Cevasco 2007, p. 126)

the herbaceous cover by mowing the grass at the end of June and allows grazing bovines beginning in September. At the end of February, the meadows are cleared with rakes and controlled fires, and the shredding of the scattered trees of Turkey oak. These direct and indirect actions on the grassy cover allow the growth, in May, of gentians and orchids and, in the third decade of April, of prized mushrooms such as *spinaroli* (genus *Tricholoma*) and a whole array of herbs edible by humans or animals. Besides, being cultivated alternately, these pasture meadows form a shifting mosaic of small fields of oats, medicinal herb, clover, potatoes, grain, and maize that provide a suitable habitat for small non-migratory fauna such as hares.

The above cycle of practices interacts with the ecology and diversity of the grassy cover at several levels, activating specific resources. The degree of domesticity of the various elements of the land mosaic is not stable, being constantly modified by the continuity or discontinuity of land managing practices. This affects variations in, and interactions among, the animal and plant populations of individual plots, maintaining a constantly fluid transition from "domestic" to "wild" and back (Fig. 4.3).

It was recently discovered that the soil itself can preserve stratified historical memories of the biodiversity of rural landscapes. Several examples are known in northern Europe (for example Jonsson 1995). Investigations in ecological history have also detected such "memories" in the beech-wooded pastures of the northern Apennines (Cevasco and Molinari 2010), although similar observations could be made all over the Apennine mountain range.

Here, soil pollen analysis in a relic parcel of centuries-old pollarded beech trees, today almost totally lacking its original grassy component, revealed the history of its biodiversity. The results for the last three centuries can be summarized as follows:

c. 1960–1970	Disappearance of pollens of	Graminaceae (their sharp decline begins around 1800)
		Plantago (last peak around 1930–1940)
		Compositae Liguliflorae (last peak around 1930–1940)
		Trollius (last peak around 1950)
		Umbelliferae
c. 1930–1940	Disappearance of pollens of	Caryophyllaceae
	Decrease of pollens of	Compositae Tubuliflorae (last peak around 1930–1940)
		Ferns
c. 1900	Disappearance of pollens of	Urticaceae
c. 1800	Disappearance of pollens of	*Rumex Biscutella*
	Beginning of the decline of pollen of	Graminaceae

N.B. This chronology is based on radioisotopic dating of pollen layer correlated with dated activities, such as fir reforestation, which effects were recorded in the diagram

The system appears to have been established in the Early Middle Ages (c. 800 A.D.) and was preceded by a transition to fir woods, also used as pastures to varying degrees. The table clearly shows various stages of biodiversity loss. The most dramatic is the most recent one (second half of the twentieth century), witnessing the almost complete disappearance, after a full 2,700 years of documented continuity, of the grassy cover, replaced today by a thick bed of beech leaves. The decline of herbaceous resources in wooded pastures in the course of the twentieth century is directly ascribable, along the Apennine main watershed, with the decline of ovine transhumance systems, and subsequently of all forms of permanent grazing as well.

Policies at the European scale are needed for an adequate management of the historical biodiversity typical of rural landscapes. Above all, we need to arrive at a shared definition of the concept of "living rural heritage". This concept should refer not so much to biological and genetic heredity, for example of domestic breeds and varieties—"cultivation biodiversity"—drawing on approaches and competences developed especially by agronomists and geneticists; rather, it should be based on the exploration of the "environmental biodiversity" informing LRHIs, which we have characterized here as "historical biodiversity".

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Chapter 5
Landscape and Economy

Tiziano Tempesta

5.1 Introduction

When we think about the landscape, we rarely consider that it may have an economic value or even any links with economy. We are more in the habit of associating spiritual and aesthetic values to the idea of landscape which would appear to have nothing to do with money. Yet this comes from a misplaced idea of what landscape is and of what the aim of economics should be.

It is perhaps not by chance that the most comprehensive review of the Italian agricultural landscape and its transformations was produced by Emilio Sereni, who was an historian and a skilled economist.

Notwithstanding the decades that have passed since the publishing of the "*Storia del paesaggio agrario italiano*" (Sereni 1986), in order to understand the indissoluble bond between landscape and economy it is indispensable to start from some of his insights. On the one hand he defined the agricultural landscape as "the shape which man, through his farming activities, consciously and systematically imprints on the natural landscape". Later, in commenting on the role played by the intervention of Rome in the formation of the Italian agricultural landscape, the author adds: "We find ourselves in front of one of the most characteristic cases of what may be called the "law of inertia" of the agricultural landscape: that once laid out in particular forms, these tend to endure—even when the production practices that had originated them have disappeared—until new and more decisive technologies do not arrive to disrupt them".

These two insights, fairly general yet profound, allow us to pinpoint the factors underlying the development and continuance of the agricultural landscape, of its being at the same time a product of today and yesterday. On the one hand it is obvious that, in a given environment, every human group tends to transform the territory in a way that maximizes the benefits for society and for individuals in that society.

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The type and entity of the transformation will depend first of all on the resources available in terms of labour, capital and technology. In second place, it should not be forgotten that every social group has, over time, formulated rules that influence and govern both the use of resources and the organization of economic activities (relations of production). Note that, in general, what happens in the initial phases of transformation of the natural environment, or in the phases when substantial amounts of capital and/or adequate technologies are available, tends to profoundly influence the subsequent evolution of the landscape. The "law of inertia" is essentially due to economic reasons. A cultural and territorial system of the past will be modified only when, having the appropriate technology available, the resulting benefits are greater than the costs required. In the case of some types of infrastructure (the road network, irrigation and drainage canals, etc.), the costs of any transformation may be so high that they are not feasible even when the existing territorial arrangement is no longer entirely practical for the carrying out of agro-sylvo-pastoral activities.

However, an approach anchored to a mere analysis of the costs and benefits for the economic activities cannot give a full account of the inertia of agricultural landscapes. As observed, the transformations of the territory are not only the outcome of the intervention of the single individual, but rather the product of the cultural evolution of a social group, in contact with a given territory. In the moment when he "creates" a territory, man also establishes a society and a culture. A dialectical relationship exists between development of the landscape and establishment of a culture.

Human activities can therefore never be interpreted exclusively from a mere productive perspective. Indeed, the objectives of a cultural group may go beyond those more strictly productive. Among these objectives, a top priority is the protection of the group and its identity. The landscape is therefore also always an expression of the identity of a group and its conservation can be a value in itself, above and beyond the profitability of the production factors used. This leads to an obvious contradiction between the production needs (that in contemporary society have an essentially individual dimension) and the needs (wellbeing) of society.

It should also be remembered that, in contemporary society, the landscape can have a value which goes beyond the interest of the social group that has contributed to its present configuration, assuming, in some contexts, the nature of a historical-cultural good. On a par with other testimonies of the past (books, works of art, etc.), the landscape is a repository of cultural values whose importance may not be completely understood by those who now live in a given territory.

A proper understanding of what are the "values" of the landscape in general, and of historical landscapes in particular, is a basic element for the correct implementation of landscape policies that are effective and shared by the population. In this paper, after giving a brief outline of the economic nature of landscape, and the resulting problems for territorial management, the benefits that the landscape can provide will be analyzed. Lastly, some indications will be provided on the actions that may be undertaken for the preservation of historical agricultural landscapes.[1]

[1] Although the term agricultural landscape cannot be considered entirely correct because, in the strictest terms, it does not include pastoral and forest landscapes, it has been preferred to use this expression for reasons of simplicity.

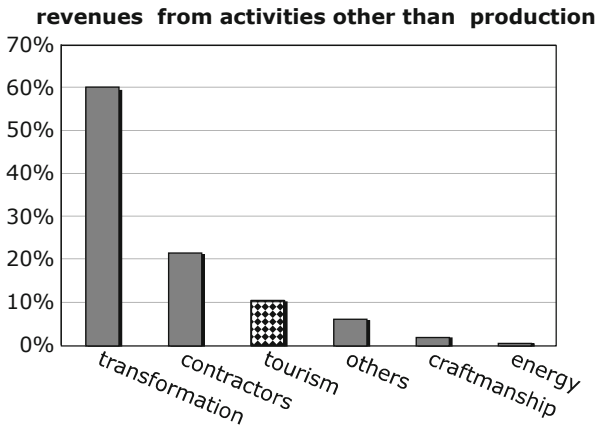

Fig. 5.1 Tourism in Italy is one of the most important source of income among activities other than production in rural areas. (Source: National Plan for Rural Development 2007–2013)

5.2 The Economic Characteristics of the Landscape

From an economic point of view, the landscape can be considered a pure public good, a good for which principles of excludability and rivalry do not exist and it is not possible for a market to develop. Obviously this does not mean that it cannot have a value, but only that it cannot become an object of trade by a private individual and cannot have a price (Tempesta 1997). A second characteristic of the landscape is that it is an externality (positive or negative) of human activities and, in the case of the agricultural landscape, of agro-sylvo-pastoral activities. It follows that its quality does not depend on an intentional action by a farmer who is working only to make a profit, but is instead an external and unplanned effect of his activity. For example, the conservation of an historical agricultural landscape is a positive externality because the farmer is not remunerated for the landscape benefits that he produces for society as a whole, but only for the goods that he is able to sell on the market. According to economic theory, the lack of remuneration for external benefits means that the supply of positive externalities is lower than would be optimal from the social point of view. The opposite happens with activities that involve negative externalities. In this case the producer will burden society with a cost (the loss of landscape quality) that he does not have to reimburse to the citizens (Fig. 5.1).

Lastly, being a historical-cultural good, the landscape can assume the nature of a merit good. According to economic theory, in the case of merit goods, the benefits perceived by the citizens, because of their lack of knowledge, are lower than those effectively enjoyed or which future generations can enjoy.

A discrepancy therefore exists between market values and social values, and sometimes between perceived values and real value, which may lead to the disappearance of historical landscapes or to their degradation. For example, a farmer, like any businessman, will be interested in obtaining the maximum income from his activities or from his owning the land. Faced with a reduction in the profitability of a crop and the remuneration of the production factors compared with alternative uses, he will have

only two possible choices: abandon the crop or adopt new production techniques that allow adequate profit margins to be regained. In the former case the crop will disappear, in the latter new production techniques or new crops will be introduced that involve land use changes. In either case the final outcome will be an alteration of the landscape inherited from the past.

There are two main, if not exclusive,[2] ways to correct the incapacity of the market to guarantee an adequate level of landscape quality: land use restrictions and the payment of subsidies. The land use restrictions imposing constraints will inevitably involve costs to private individuals in terms of lost income. Restrictions always involve an inefficient use of the production factors and thus the presence of opportunities for more profitable alternative uses. The land use restriction tool can be socially acceptable when its incidence on the income of the farmers is not overly high, otherwise it might encourage abandonment of the crop, thus accelerating the degradation instead of reducing it.

The payment of subsidies for the conservation and restoration of the landscape was introduced for the first time in EC agricultural policy with Reg. 797 of 1985 (Marangon and Troiano 2006) and is still one of the possible sectors of intervention of agro-environmental policies. The subsidies, when they are commensurate with the landscape benefits produced by the farms, are in many ways the most appropriate tool for the conservation of historical agricultural landscapes. However, the results so far achieved by state intervention in this sector can be considered modest, either because of the lack of financial resources, or due to the wide farm and territorial dispersion of the funded interventions (Marangon and Troiano 2006).

Whichever tool is used for the conservation of historical agricultural landscapes, it will be necessary to evaluate the effects of the landscape policies or, in other words to estimate what benefits there will be for the population. In the case of land use constraints, the lack of quantification of the benefits will bring about a refusal of state intervention and the tendency of citizens to circumvent the law. In the case of subsidies, the amounts allocated to this type of intervention could be lower than would be desirable.

It follows that, if the value of the landscape (or, if preferred, the benefits that it produces) is not made explicit, efficacious policies of landscape conservation cannot be implemented.

[2] According to some authors (Reho 2006; Marangon 2006), recourse to instruments of the voluntary type could allow actions of landscape conservation to be implemented regardless of state intervention. This would be possible in all the cases where a commercial good can be identified whose production might in some way be complementary to landscape conservation. For example, if rural tourism was in some way linked to landscape quality, farmers, aware of the preferences of the tourists, might work voluntarily to conserve the landscape. Or, if the landscape was in some way perceived by consumers as an indicator of quality of a local farm product, its conservation would guarantee higher prices and therefore increased profitability. However, these possibilities meet major difficulties at operational level. In the case of rural tourism, the costs of landscape conservation weigh equally on all the farms of a given area, while the benefits are the privilege of the few involved in the sale of services to the visitors. In the case of typical local products, many farmers might be encouraged to behave like free riders, adopting production techniques that degrade the landscape, in the assumption that some other farmer will contribute towards conserving an adequate level of landscape quality.

5.3 The Value of the Landscape

From a general point of view it may be stated that anything that can satisfy needs is a resource, and that each resource, if scarce (i.e. available in insufficient amounts to meet needs), will become an economic good and have a value that can be expressed monetarily. But what are the benefits produced by the landscape? To provide a response to this it can be observed that people, when they wish to relax, try to pass some of their time in areas with particular landscape characteristics. A great many individuals make frequent trips to the hills or mountains, or else go for a walk along rivers or in areas of countryside with a lot of meadows, hedgerows, woodlands and watercourses (Marangon 2006; Tempesta and Visintin 2002). From more than 500 interviews conducted in Veneto it emerged that the quality of the landscape is the main element considered in the choice of where to make a day-trip. This depends essentially on the restorative capacity of landscapes largely untouched by man and rich in natural elements (Kaplan 1995, 2001b; Kaplan 2001a). It has been seen for example, that the quality of the landscape interacts with numerous physiological parameters of an individual and that more pleasant landscapes tend to improve overall personal wellbeing (Berto 2005; Hartig et al. 2003; Ulrich 1984; Ulrich et al. 1991; Wells 2000).

5.3.1 Perception and Value of the Landscape

In order to understand which factors render a landscape attractive and pleasing it is first necessary to remember that, in the course of human evolution, visual perception has played a fundamental role from an ecological point of view: in the environment where man passed the major part of his evolutionary phase, the African savannah, only a precise perception of the external environment could allow an individual to survive. It follows that the ways of visually perceiving the environment, and therefore the landscape, are an essential part of the genetic heritage that has been selected over the course of millions of years. Appleton (1975) indicated that the elements which make a landscape appealing are those that render a given environment favourable to survival. From this point of view human behaviour can be considered similar to that of all the animals.

On the other hand, much of human behaviour derives from learning and experience. According to Bourassa (1990), we can distinguish three components of the perception of the environment: innate (or instinctive), social and individual. The innate component is linked to our genetic heritage and is common to all individuals. The social and individual components instead derive from learning and are related to the different phases of development of a person. In the first period, which corresponds to early childhood, the relationship with the environment is mediated by the adults who transmit the culture (including environmental and landscape) of the social group. Later on, the relationship with the environment and the territory

will assume an entirely personal dimension and will essentially depend on individual cognitive processes. As regards the instinctive perception, many studies (Kaplan and Kaplan 1989; Parsons and Daniel 2002) report that all the elements are generally preferred which are in some way a reminder of the savannah (the environment where man passed most of his evolutionary phase), therefore undulating landscapes with scattered trees, woodlands, grasslands and small watercourses. On the contrary, the social factors that determine the perceptive value are much more variable, because they are strictly related to the social group and the changes that the culture is subjected to over time. The transformation of the environment is, as previously mentioned, one of the processes through which a social group tries to establish its own identity. According to Costonis (1982), every manmade landscape contains identifying elements that have the function of enhancing the cultural and social stability of the society or group that created it and, at individual level, there is a tendency to prefer the landscape which contains the signs (symbols) of the group. Transmission of the identifying values of the landscape happens during early childhood and is deeply rooted in the individual, operating mainly at an unconscious and emotional level.

The more strictly individual component depends on many factors such as education received, employment, social status, etc. In general, however, it can be ascribed to some elements typical of western culture that are transmitted by higher education. The precepts of "beauty" in this case are the fruit of conceptual processing of the more educated elite and, although mutable in time, have retained some fixed points, in many ways ascribable to classical culture. It can be claimed that there are two basic components to this system of preferences. The first tends to favour natural landscapes which, in some way, can be traced back to that of the savannah (for example the Arcadian landscape, English garden, etc.) (Appleton 1975). The second, on the contrary, favours elements like the harmony, the relationship between proportions, or, more generally, the capacity of man to modify the natural environment in an equilibrated way. This second element therefore tends to favour the appreciation of cultural landscapes, their peculiarity and preservation.

While the benefits of the first two components (instinctive and social) are ascribable to the sense of security that comes from being in a known environment, the third can be ascribed to the need for beauty that man has displayed from a certain stage of his development onwards, demonstrated by the emergence of the first artistic forms and the attention paid not only to the function, but also to the appearance, of artefacts produced from the earliest times (Fig. 5.2).

5.3.2 The Economic Value of Italian Agricultural Landscapes

Man therefore expresses a demand for landscape quality that tends to be biased towards natural and cultural landscapes. As observed, many tourist and recreational activities are motivated by the quest for landscapes of high quality. The fact that a given proportion of the population sustains costs to frequent a landscape implies

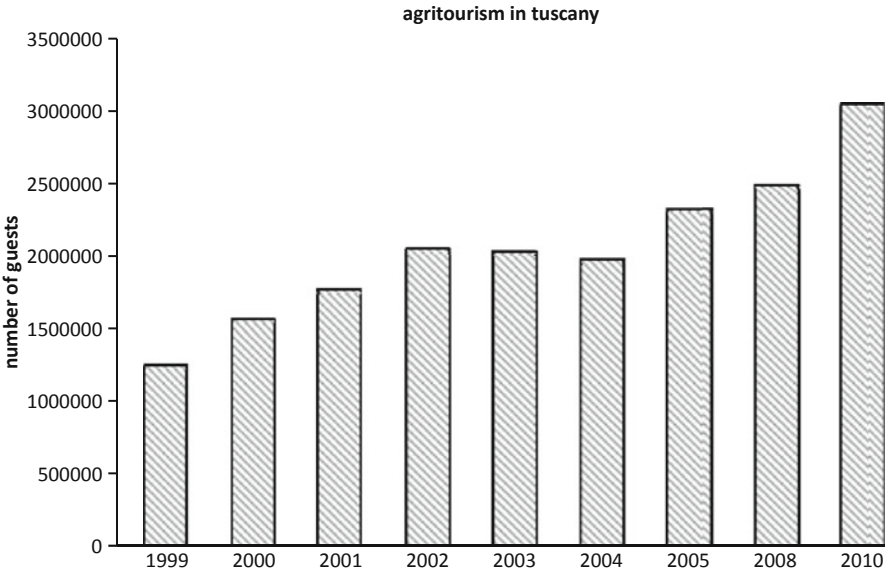

Fig. 5.2 Over the last 10 years agritourism has been growing constantly in Italy, especially in Tuscany, even after 2010, when the economic crisis worsened. This success is largely based on the value of the rural landscape and the lifestyle associated with it. In southern Italy, where economic conditions are particularly difficult, there has been an 80 % increase in the number of agritourism farms in the same period. (Source: Region of Tuscany)

that that landscape can provide benefits whose monetary value is higher than or equal to the costs incurred. The quality of the landscape can also affect the value of houses (Bourassa et al. 2003; Geoghegan et al. 1997; Ready and Abdalla 2003; Tagliafierro 2005) or the cost of an overnight stay on farm holidays (Le Goffe 2000; Vanslembrouck et al. 2005).

Many studies conducted in Italy since the 1990s have allowed a rough order of magnitude to be gained of the economic value that the population attributes to conservation of the historical agricultural landscape. Between 1997 and 2007, sixteen evaluations of the landscape were conducted in Italy utilizing the contingent valuation method (Marangon and Tempesta 2008). In 11 of these, the aim of the investigation was to evaluate the benefits attributed by the resident population or by tourists to the conservation of historical agricultural landscapes (Tempesta 2006). Even taking into account the lack of homogeneity of the approaches used, it can be estimated that the average willingness to pay is 60 € per family per year, i.e. amounting to around € 1 billion 290 million per year.

This is an amount that is higher than the total of the agricultural subsidies paid out annually through the EU agro-environmental measures from 2000 to 2006. This clearly shows that the conservation of traditional landscapes can produce benefits for the population that go much further than the amount distributed for these purposes

by the various agricultural policy measures. It follows that there is the need for a revision of state intervention in agriculture, which should become increasingly directed towards conservation and, where possible, to the restoration of historical agricultural landscapes, rendering the productivity viewpoint that still pervades the EU agricultural policy obsolete.

5.4 Oeno-Gastronomic Tourism and Promotion of Farm Produce

Since after the Second World War, there have been profound changes in crops and production techniques in Italian agriculture. In the attempt to narrow the existing gap with other economic activities, in order to increase the yields of the production factors used (labour in particular), labour-saving technologies have been adopted that have led, especially on the plains, to a drastic simplification of the landscape. In parallel, to meet the need to produce foodstuffs with uniform characteristics, the agri-food sector has forced farmers to drastically reduce the varieties grown, with an increasing standardization of the produce. The local varieties have gradually been substituted by selected, often imported, varieties with high yields per hectare. These processes and the opening of the markets have exposed Italian agriculture to foreign competition, often thwarting the possible economic benefits of technological changes. The gap between the average income of the population and that of farmers, despite radical changes in the production system and massive state funding, has not lessened over time. However, technological changes and the disappearance of traditional products have caused the complete transformation of historical agricultural landscapes, which have often lost their identity.

However, since the 1990s, new phenomena have made progress that might allow this trend to be inverted, at least partially. Firstly, the affluence reached by the Italian population has led to the emergence of a new sector of demand for foodstuffs, with growing interest in their quality and typicality. There has also been a progressive reconciliation of the population to the rural territory, in the quest for that quality of life and countryside that has been lost in the vast metropolitan conurbations. To gain an idea of the importance of rural and oeno-gastronomic tourism, on the approximately 14,800 Italian farms that offer holiday accommodation, around 900,000 guests and 4.5 million overnight stays are currently recorded. According to the fifth Report on Wine Tourism, compiled by the *Città del Vino* and Censis, there were around 4–5 million wine tourists in 2005. The average expenditure per capita is around 160 €, of which one fifth is for the purchase of wine and the rest for accommodation, refreshments and the purchase of typical local products. Oeno-gastronomic tourism brings the consumer into contact with the place where the food that he eats is produced. Within this scenario, the quality of the landscape can become a strategic factor for the promotion of agri-food products. While it is true that many typical farm products are nowadays produced using modern techniques that often have very little to do with what happened in the past (for example viticulture on the plain and

sometimes on the hills), it is equally true that abstaining from the promotion of the identifying and cultural characteristics of the landscape of the production area means relinquishing a priori the definition of an image of the product that could conquer important sectors of the tourist and agri-food demand. Obviously this cannot mean a return to the farming of the past, but thought must be given to the need to pay close attention to the conservation of all those elements of the historical landscape that may contribute to the success of the image of the product and of the territory.

5.5 Conclusions

The historical agricultural landscapes are a resource for the rural areas and society as a whole. They can produce direct benefits for the residents and for tourists and can be the engine for important economic growth from which the local communities benefit. They can also, with their strong evocative power, be a powerful tool for the promotion of agri-food produce, and for the development of niche products that can in some way escape the competition from foreign products. But can this great cultural heritage of Italy have a future, and if so, on what conditions?

A first condition, which might appear obvious, is that these landscapes have to be recognized and identified. The characterizing and structuring elements must be defined, be they geomorphological, structural, infrastructural or cultural. Unfortunately, it increasingly often happens that the loss of ties to the country traditions translates into an incapacity to recognize historical landscapes, an incapacity that not only concerns the population, but even more worryingly, those who should be appointed to the task of their protection. If the population is no longer able to recognize the identity signs of the landscape, it will have no incentive to preserve them. Conservation will become merely an unwieldy burden capable of limiting economic growth. This is even more important if it is considered that farmers never work exclusively to make a profit. As the studies conducted in the field of cognitive economics have shown, the motivations not directly linked to income, such as a sense of responsibility towards his neighbour or the community, are often at the basis of behaviours that would otherwise be inexplicable. For the preservation of a dry stone wall, the economic incentives might not be enough if the farmer does not first recognize its cultural importance.

A second important condition will be the identification of thresholds of transformability that allow the landscapes of the past to be adapted to modern cropping needs. Obviously it cannot be expected that viticulture can be practised everywhere in its historical form of the "*piantata intermedia*".[3] This can only happen in limited areas and mainly for didactic purposes. However, it is necessary to avoid that the

[3] A "piantata intermedia" is a cultivated plot bordered by rows of vines supported by maples and later by mulberry trees. For centuries, vine plots were the only way that vines were grown on the plain.

structuring elements of the landscape are disrupted, such as the agricultural hydraulic system, inter-farm road network, morphology, pattern of settlements, etc.

A sector still practically unexplored, but which must attract the attention of researchers and administrators in the future, is the link that can connect the landscape to the perception of the quality of a product. A preliminary study conducted at the University of Padova has demonstrated that some historical agricultural landscapes have enough evocative power to alter the perception of the taste of a wine (Tempesta et al. 2010).

Lastly, it should be pointed out that the historical agricultural landscapes can be conserved only if there is a thorough revision of state intervention in this sector. Agricultural policy has been, and in many ways still is, a not insignificant factor in the degradation of historical landscapes. An important share of the agricultural subsidies still regards income support and the conditionality entails, in almost every case, the environment and not the landscape in itself. The payment of subsidies within the ambits of agro-environmental actions has often been directed towards actions of re-naturalization that had nothing to do with the characteristics of the historical agricultural landscape. Alongside technological and production standardization, a sort of nature standardization has made the re-naturalization of the territory the cornerstone of the actions of landscape importance in many rural areas.

It is therefore necessary that an increasing quota of the subsidies paid to farms is aimed at actions of conservation and restoration of historical landscapes.

However, this might not be sufficient without a change in the way the subsidies are distributed. It should no longer be exclusively the individual farmers involved, but the local community that makes restoration of the landscape an element of strength for its future development. This can only be made possible by integrating territorial and landscape planning actions with the interventions of agricultural policy and rural development. Territorial and landscape planning should provide the opportunity for local communities to define the priorities and aims of landscape actions; agricultural policy should provide the tools for achieving these objectives.

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Trentino
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Calabria
Sardegna
Sicilia
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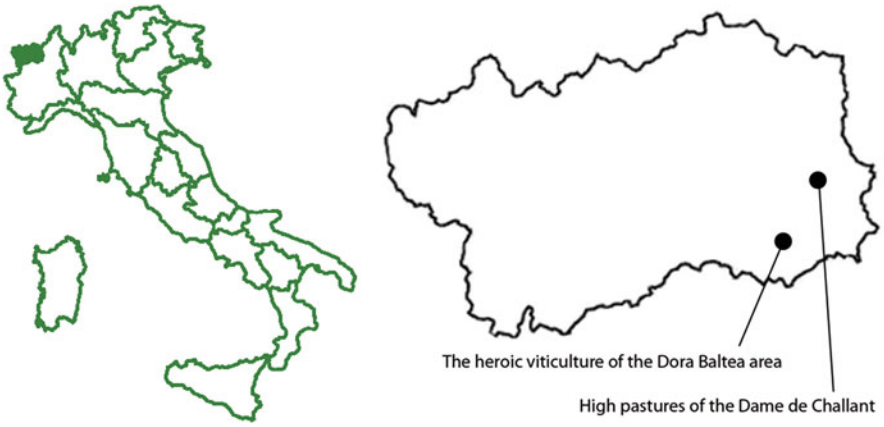
MARE ADRIATICO
MAR TIRRENO
MAR IONIO

Part II
The Landscapes

Chapter 6
Valle d'Aosta

Diego Moreno



6.1 Introduction

The altitude of the Valle D'Aosta Region varies between 500–1,000 m a.s.l., in the central valley, to 2,000–2,500 m a.s.l., in the case of the slopes and peaks of the lateral valleys. As a result of this particularly varied morphology, traditional agriculture has had to integrate resources located at different altitudes and adopt a system of seasonal migration. One must note however that the extent of cultivations is only 0.5 % of the SAU (Utilized Agricultural Surface as measured by ISTAT) and declining, with a 20 % fall limited to the 1990–2000 period. Meadows and pastures (21.8 %) and woods (32.5 %) are a much more significant presence in the landscape. Furthermore, the particularly irregular terrain associated with high altitudes determines an extreme fragmentation of cultivatable areas and a variety of microclimates that causes each

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small area to require an "individual" approach. In some cases, an isolated boulder or a cliff may reflect the sunlight and accumulate heat making it possible to establish a vineyard. In other areas, the steepness of south-facing slopes allows farmers to cultivate cereals up to 2,000 m a.s.l. Thus one cannot speak of "farms" in terms of a unitary area, but rather as business units distributed discontinuously over the land at various altitudes. Generally speaking, at lower altitudes corn, vegetables, fruit (especially apples) and forage are cultivated; in the lower slopes of the central valley, in the *adrèt* areas (the local name for south-facing slopes) vine is the main cultivation; at medium altitude (600–1,000 m a.s.l.), wheat is cultivated in the flatter and more sunlit areas, and chestnuts on the steeper slopes and especially on the ones facing north (*envers*); at higher altitudes, forage is cultivated in the more irrigated areas and cereals in the drier and south-facing slopes, up to the limit of the trees; at high altitudes, between 2,500–2,800 m a.s.l., are the meadow-pastures. Woods are limited to north-facing slopes with a grade above 100 %, and integrate the economy of farms by providing wood for heating, cheese-production, building, and for vineyard props. The above organization, however, is not always applied, being based not only on the characteristics of the land, but also on those of each farm. More specifically, farm owners which find themselves without the land suitable for a particular type of cultivation, due to succession or other reason, may decide to use a generally unsuited piece of land or alternatively to "construct" an adequate piece of land, by terracing and filling-in a rocky or steep but otherwise suitable area, or by freeing from rocks an area subject to landslides (in the process erecting *meurdzìe*—small walls of rocks at the border of properties, which characteristically segment the landscape), or by clearing out the woods. In general the land is subject to many interventions aimed at adapting it to agriculture, such as dry-stone walls for terraced vineyards, stables with their fertilization and irrigation systems, irrigation conducts, draining ditches and other works aimed at protecting the land from torrents, which are prone to sudden and violent floods.

The tendency of each farm to integrate productions at different altitudes meant the adoption of a seasonal migratory system, with the presence of multiple buildings in the various properties, used as residence, stable, magazine of varying dimensions depending on the extension and productivity of the land. For example, to better exploit available forage, in spring family livestock (usually 1–4 heads) were kept at medium altitude in small stables (locally known as *mayen*). These stables were located in small clearings cleared out in the less steep areas in the middle of the woods. This left the fields in the valley free for a first mowing towards the end of May (a second mowing was done in the summer), while the animals were fed instead with the grass of the woods. Towards the end of June, the animals were herded and taken to the higher pastures, making possible the mowing of the forage areas of medium-high mountain, in which hay-time happens, depending on the altitude and year, in the period from the end of June to the end of July. A cow, or more often a goat, was often kept with the family to provide milk and be used as working animal. These migratory movements did not always go from the foot to the summit of the slopes of the same valley, but often went from one valley to a nearby one, following existing tracks rather than the more direct routes.

On account of this irregular morphology and peculiar farm organization, it is difficult to specify the borders of a clearly defined "agrarian landscape." One could try to describe the land in terms of small-scale distribution of types of landscape (for example, the landscape of viticulture, of cereals, of chestnuts), however, because of the presence of microclimates a cartography based on this approach produced a series of small isolated areas located a few kilometers from one another, most of them less than 10 ha in size. We have therefore chosen to describe a few types of landscape based on the altitude more than on farm organization.

6.2 High-Mountain Pastures at Dame de Challant (45° 44′ 19″ N; 7° 47′ 30″ E)

This pasture area extends for about 3,000 ha, in the municipalities of Brusson, Gressoney-Saint-Jean, Challand-Saint-Anselme, Challand-Saint-Victor, Issime and Gaby. The area consists mainly of private properties managed by farmer's unions, and is partly protected under landscape law 431/85. Besides pastures, it includes also rocky areas and mountain peaks, at altitudes varying between 1,500 and 2,800 m a.s.l. Regional route SR 44 goes through the towns of Issime, Gaby and Gressoney-Saint-Jean, while SR 45 (also named state road SS 506) goes through Challand-Saint-Victor, Challand-Saint-Anselme and Brusson. Both roads can be reached from toll-road A5, exiting at Pont-Saint-Martin and taking SS 45 or at Verrès and taking SS 44. The pastures can be reached taking municipal roads going from Brusson to the sub-municipality of Estoul, or from Gressoney-Saint-Jean to the sub-municipality of Weissmatten, or through the small roads leading up to the mountains from the town centers. The area is characterized by a schist ridge that come down from the morains of Mount Rosa, separating the two valleys and then expanding in a high-altitude area, undulated and abounding in small lakes at the foot of the massif of the Dame de Challant. The geological substratum consists largely of gneiss mica schist, sometimes with inclusions of sodium-pyroxene.

The significance of the area lies in the persistence of an historical landscape resulting from high-altitude pasturing, an activity that since antiquity had been the main resource of the Valle d'Aosta, and of almost all high-mountain areas, since the altitude and the brief warm season are a major obstacle to any type of cultivation. At particularly high altitudes, usually around 1,800–2,000 m a.s.l., where not even rye would grow, all the land could offer was grass. The few heads of livestock owned by each family in the winter were kept in stables and fed with hay, while in the half-seasons they were transferred to huts at medium altitudes, in order to allow grass to grow in mowable areas and forage to be stocked for the winter. These small pastures called *mayèn* were mostly located in clearings obtained from the deforestation of the flatter areas, a practice that has created a peculiar type of forest, which seen from above presents a number of "holes" of lighter green. During the summer, livestock was rented to shepherds, who often also brought their own animals from the plains. Shepherds gathered the livestock into large herds and took

it to the high pastures. The use of the area for pastures is documented by many inventories, notary wills and sale acts from thirteenth to the twentieth century, by documents concerning controversies and court-cases on the use and ownership of the land, and infeudation acts describing the lands and their borders. The documents attest the existence of transhumance from the nearby areas of Canavese (cattle) and Biellese (sheep) since the thirteenth century, according to a consolidated tradition of commercial exchanges between mountains and plains that continues to the present day. In the areas that lend themselves to pasturing in the course of time a number of buildings in stone (the only material available on site) have been erected. They generally have two floors, the lower one being used as stable and the upper one as lodging for the herdsmen. In the areas vulnerable to avalanches, the buildings have instead only one floor, with the slope side interred in the slope in order to offer the least resistance against the mass of snow. These seasonal abodes are usually set on the more elevated areas of a small valley or a slope, in order to be able to use stable sewage to fertilize the pastures through as series of small conducts. Attached to the stable or separated from it, there are small addition buildings used as magazines or to cheese production, and nearby there is always a drinking trough and a manure pit. Many of the mountain pastures are still used and various types of cheese are produced, including the Toma di Gressoney, which is on the list of the Slow Food association.

The landscape largely retains in integrity. A few country roads have been built, most of them dirt roads, and a few large modern stables more suited to the present needs. Many areas cannot be accessed by road, which has helped them retain intact their original high-mountain landscape, also thanks to the fact that many of the larger pastures are still being used and that buildings have been rebuilt subject landscape plan regulations. Though in many cases the reconstructed buildings are much larger than the traditional ones, the vastness of the landscape minimizes their visual impact, limiting it to the immediately surrounding area, and the adoption of facings in stone or rough cement assimilates the buildings to the color of the many stone quarries of the area. Only the more remote and smaller pastures have been abandoned in the last 30 years. In the pastures there are many ponds and small lakes and the flora is very diversified. In a gorge in the municipality of Issime (Vallone di San Grato), which has been proposed as protected area, there are many typical houses (*stadel*), one of which is made entirely of wood, being the only known example of this architecture in the Valle d'Aosta Region, and possibly the first example of Walser culture in the valley of Gressoney.

The greatest threat against the integrity of high-altitude pastures comes from the expansion of ski-slopes. One might add however that the use of alien forms and materials in the ski-slopes has resulted in a juxtaposition of sign codes rather than creating an actual visual interference. The ski-slopes are located in two sub-areas and they have a limited impact, also given that they are used in the winter, whereas pastures are used in the summer when the landscape regains its traditional aspect (Fig. 6.1).

Fig. 6.1 The conservation of traditional buildings and pastures enhances the value of the historical alpine landscape near Brusson-Fenilliaz

6.3 The "Heroic Viticulture" of the Dora Baltea Area (45° 36′ 24″ N; 7° 45′ 51″ E)

The area corresponds to the vineyards on the south-looking slopes on the left and right bank of the Dora Baltea. It extends for about 80 ha, privately owned, located in the municipalities of Pont Sant Martin, Donnas, Bard. The area can be accessed taking the A6 toll-road, exiting at Pont San Martin, taking state road SS 26, which goes through the entire area, and finally taking the rural road that goes through the vineyards between Donnas and Pont Saint Martin. The altitude varies between 350 and 600 m a.s.l. The geological substratum is the alluvial plain of the river Dora in the more level area, whereas the area above the fortress of Bard has a substratum of eclogite micaschists of the Sesia-Lanzo area, with evident traces of glacial morphologies (streaks, sheepback rock, "marmitte dei giganti", glacial erratic rocks in the valley). Above the villages of Donnas and Pont Saint-Martin the slopes are characterized instead by glacial and detrital deposits, which in the lower areas had created landslide deposits, which were terraced to plant vineyards.

The significance of the area lies in its beauty and in the persistence of the historical features of mountain viticulture. The presence of viticulture is documented by an abundance of inventories and notary acts concerning wills and sales, dating from the thirteenth to the twentieth century, as well as infeudation acts describing plots of land and the type of cultivations. Sixteenth century documents attest the presence of

viticulture and the exportation of wine and grappa towards the area of Vallese. There are no specific visual documents, rather viticulture appears casually and in a non-detailed fashion as a background to images of the fortress of Bard, especially in sketches by nineteenth-century English travelers. Wine grapes were never an isolated cultivation, rather they were part of a polycultural organization, which integrated grapes with cereals, fodder, and other small fruit and vegetable cultivations for personal consumption. In the Valle d'Aosta region, the scarcity of farmland, natural dangers, the steepness of the land, a problematic climate and the consequently forced seasonality of agriculture led to a type of farming that integrated various productions according to the altitude. Each farm was actually made up of different properties located at different altitudes. This made it possible to concentrate on different crops, depending on the season. To avoid freezing in winter, vineyards are located close to cliffs or rocky outcrops, which during the day accumulate the heat of the sun and give it back during the night. In some cases, in the presence of large boulders, the trellises are laid directly on the rocks in order to make the most of their heat.

Notwithstanding the presence of urbanized areas, the traditional landscape has largely maintained its integrity. While vineyards are subdivided into very small holdings, on a visual level they appear as a continuous landscape, which shows the incredible job performed throughout the centuries to farm lands that in themselves were ill-suited to agriculture. Hence, the nickname of "heroic viticulture". The characteristics of the area made it necessary to build stairways and catch water drains along the lines of maximum steepness, contributing to the integrated and systematic look of the entire slope, up to the altitude where vineyards border—nowadays in a more uncertain and partial fashion due to uncultivated patches of land—with the chestnut coppice woods, which once provided the timber for the traditional pergolas (*topie*). From this vineyard is produced the high quality wine "Valle d'Aosta subarea Donnas" DOC (Controlled Origin Denomination). In the area one finds also small huts for farm tools built into the supporting walls and some tiny stone service buildings. But the most typical visual elements are the small conical truncated columns in plastered stone, surmounted by stone disks. On the top of these columns the pergola poles are laid. The whole lends to the slopes the appearance of a construction of sorts, especially in wintertime when the vines are bare. For this reason, the area has a great scenic impact when seen from the valley extending along the river Dora. The significance of the landscape is fully appreciated by the local population, who perceive it as part of their identity, and its scenic value is stressed by the Landscape Territorial Plan of the region and by the municipal plan. In the larger areas, careful attention has been given to the preservation of the original features of the landscape even when improving the land (service road halfway up the hill, with stone wall and partial dissembling of the height of the walls—vertical single track carrel system—preservation of the traditional system of stairways and catch water drains), so that the traditional image of the land can be said to be still correctly preserved.

The vulnerability of the area can be summarized as following. At the beginning of the twentieth century, the damage caused by phylloxera caused a decrease in vineyard surface throughout the valley. Much vineyard land has been abandoned and colonized by woods. Since property was highly fragmented, being part of an

Fig. 6.2 Terraced vineyards near Donnas, Dora Baltea river

agriculture oriented towards family support, the landscape has been subject to interruptions that threaten its integrity altering the balance of an environment which is definitely marked by human presence and can continue to exist only through continuous maintenance. Viticulture has been on the rise in the last 20 years, this however has been accompanied by the abandoning of traditional farming methods in favor of the "rittocchino" mechanized method, in which the rows of vines follow the inclination of the land. The area in question, however, has maintained its traditional features, notwithstanding the fact that above Donnas, after WWII, the new town was built upon vineyard land. In the valley instead, there have recently been two disastrous inundations (1993 and 2000), which left a 20–150 cm thick layer of sand in the entire plain. Agricultural renovation has therefore also taken the form of unification of land plots and a change of cultivations which, combined with the dominant forage monoculture, have determined a marked decline of the typical fragmented layout of the land. The vegetation that has developed in the abandoned plots has no major impact on the scenery, although it would be best if the plots were again cultivated (Fig. 6.2).

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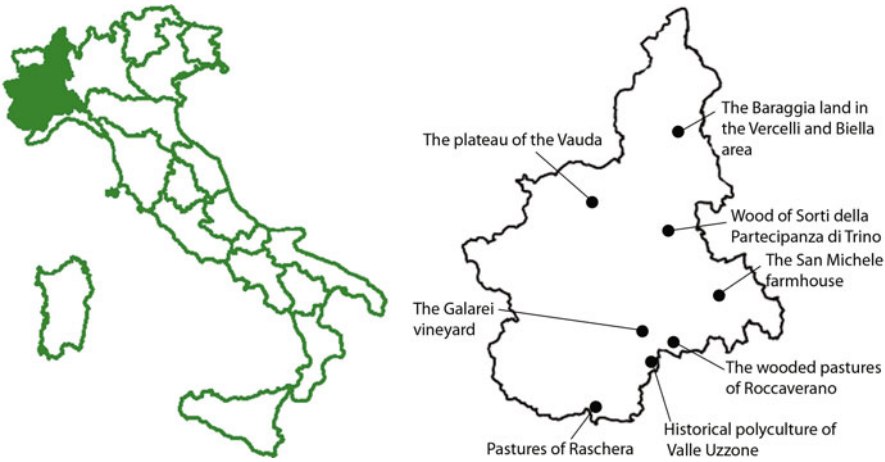
Chapter 7
Piedmont

Roberta Cevasco



7.1 Introduction

Piedmont holds the Italian record for the oldest 'Landscape Museum'. In Verbania, on Lake Maggiore, a museum with this official denomination exists since 1914 (recognized the Ministry of Public Education from the beginning). In 1988, the Museum has created its own research Center for Landscape Studies. In the context of the problem of identifying rural landscapes of historical interest in Piedmont, the important tradition of the museum of Verbania bears witness to the difficult of scientifically

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cataloging the landscapes and therefore of laying down the guidelines for their protection. The museum is evidence of a visual conception of the landscape that has characterized for almost a century, and continues to characterize, the culture of the institutions responsible for the study, protection and promotion of the landscape, a culture that has spread from the center to the periphery, from the State to the Regions all the way down to local institutions. A corollary of this well-known conception is that rural landscape, if taken at all into consideration, is interpreted as an extension of the 'landscape of villas and gardens', a view of the territory that reflects a pictorial conception, i.e., landscape as depicted in landscape painting. This conception, however, is an obstacle to the actual identification of rural landscapes in the region and is also unjustified from the perspective of the promotion of the regional heritage, considering that actual 'guides' to the rural landscape of the hills around Turin, for example in relation to viticulture and the accompanying settlements, were already available at the end of the eighteenth century, if not in the previous century, if we interpret from the perspective of the landscape the substantial regional literature on agriculture.

The region is also at the forefront in terms of its network ecological museums, of the more ramified and significant in Italy, thanks to regional act L.R. 31 of 14/3/1995. The various museums have focused their policies in the last decade on local rural society and its landscape. With rare exceptions (consider the file on Valle Uzzone), however, what emerges is a folkloristic vision of traditional rural society, typical of ecological museums characterized by a naturalistic vision of the landscape. While this view is understandable considering the regional cultural heritage, in which the perception of rural society is filtered by the perspective of Piedmont artists and literary writers of the 1840–1940 period, it ends up obscuring the actual experience and practices of local agriculture and its relation with the environmental resources of the rural landscape. Paradoxically, by emphasizing localism, based on an unwarranted assumption of a continuity in the cultural and social characteristics of the country, ecological museums have ended up erasing local reality, in its geographical material form, despite the existence of an ample literature dedicated to the medieval and modern history of rural society, especially in the area of Cuneo and Asti.

Though agriculture takes up 50 % of the regional surface, compared to woods (37 %) and pastures (15.5 %), the agrarian landscape has been profoundly modified and it is difficult to find landscapes of a certain extension, that still maintain their integrity, as opposed to mere fragments of historical landscapes. Recently a number of museums have been opened and farms have become interested in the preservation of the vine landscape. We have been able to exemplify some of these 'fragments' (see the file on Galarei vineyard), but also other types of landscape, as, for example, the farmhouses of the irrigated crop fields of the Alessandria plain (see file on Cascina S. Michele). The files in the Catalog on the summer pastures of Raschera and on the pastures of Roccaverano highlight the documented relation between local practices of pasture management, the above forms of rural landscape and the biodiversity that characterizes the vegetation in these areas. Pastures are still a significant presence in Piedmont, amounting to one third of the utilized agricultural surface (SAU) measured by ISTAT. Historical ecology has made it possible to measure the duration in time of these forms and populations and, indirectly, has provided a possible historical evidence of the sustainability of these landscapes as environmental systems. The

historical aspects of our files on the Vauda plateau and the Baraggia of Vercelli and Biella, are the result of an archeological perspective. The file on the Bosco della Partecipanza of Trino documents the role played by common rights and collective management in ensuring the survival of the woods of Piedmont. But an actual cataloging of this heritage as a premise for the protection of the historical agrarian, forest and pastoral landscapes of Piedmont is yet to be performed.

7.2 Pastures of Raschera (44° 14′ 01″ N; 7° 46′ 30″ E; 44° 11′ 32″ N; 7° 40′ 53″ E)

The area between Marguareis, Mongioie and Mondolé is one of the largest pasture areas in the province of Cuneo. The summer pastures of historical interest we have selected correspond to two different areas having a total extension of about 2,000 ha. The first is found near Punta Marguareis, south of the town of Chiusa di Pesio, while the second is located between the towns of Frabosa Soprana, Frabosa Sottana and Magliano Alpi. The pastures are private property and are located at altitudes varying between 1,000 and 2,000 m a.s.l. They are partly protected under landscape law 1497/39 and 431/85. The pastures of Punta Marguareis are also included in the Natural Park Valle Pesio and Tanaro, which is one of the SCI and SPA of the Natura 2000 network. The areas can be reached from Cuneo by taking provincial road SP 21, arriving at Chiusa di Pesio, and turning right on SP 42, which runs through the valley; the pastures of Punta Marguareis are at the southern extremity of the valley. The pastures of Frabosa can be reached by taking SP 5 at Villanova Mondovì and then SP 37 till Frabosa Sottana, and continuing on SP 327 until the sub-municipality of Prato Nevoso; from there one can reach the pastures by taking via Galassia and following it for about 5 km. The geological substratum of the pasture area is formed mostly by 'Porfiroidi del Melogno', a mix of finely grained porphyroids interbedded with schist. There are also smaller quantities of porphyroids with gneiss schist, white quartzite, quartz schist and ottrelite schist.

The significance of the areas lies in the historical complexity of forage management in an area characterized by various transhumance systems. The areas are characterized by a high level of persistence of a particularly varied flora, resulting from the processes of biodiversification caused by shepherding (the number of the vegetal species identified in the Natural Park of Alta Valle Pesio e Tanaro is 1,492, almost one fourth of the entire Italian flora). The gradual loss of species and habitats caused by the abandoning of the higher pastures, for example on the north-eastern slopes of the Mondolé above Sella Balma in the upper Maudagna valley (municipality of Frabosa), is proof that the biodiversity of these pastures is an historical product of human activity. It is not dissociated from the history of the usage of the summer pastures nor from the type of settlements: *gias*, *vaili* and *vastere* are an architecture associated with the common rights over summer pastures in the plateau of Càrsene, in the gorge of Marguareis, as in the valleys of Riofreddo and of Bellino, around Mongioie, and are related to the other seasonal sites of the system, such as the *gias* in the mid and lower slopes, and the permanent residences at the bottom of the valley. Even

Fig. 7.1 Pastures around the Rataira (2,270 m a.s.l.) lake where livestock are watered, upper western Ellero, in the municipality of Roccaforte Mondovì

the rural chapels and the other religious sites are part of this rural heritage associated with pasture rights. An example is the church of Sant'Elmo or San Domenico, at the Selle di Carnino in the valley of Maestri at 1,925 m a.s.l., which was the historical meeting place of shepherds from Liguria and from Piedmont, and previously used by shepherds to store cheese. In the area, ancient access rites still survive, both in the area of Monregale, where the 'alps' of the Lords of Morozzo are documented from the twelfth to the end of the sixteenth century, and in the area of Briga, in the medieval relations with the monks of Chiusa Pesio. The shepherds of Briga in 1430 stipulated an agreement with the town of Chiusa Pesio on an access route to the summer pastures of Conca delle Càrsene, through which they have continued to use the pastures of Marguareis. At the end of the fourteenth century, local communities of the Alps renewed their pastures rights with the town of Mondovì, and this allowed them to maintain a close relationship also with the Alps on the north-western slope of Mongioie, along the Ellero valley. At the bottom of the northern slopes of Mongioie, in the upper Corsaglia valley, which belongs administratively to the municipality of Magliano Alpi, the place-name Raschera was passed on to the local cheese *Raschera di Alpeggio*, which obtained in 1982 the old DOC (Controlled Origin Denomination) label, and in 1996 the PDO label, is nowadays commercialized. The local *toma* made of unprocessed milk from Brigasca sheep is also present in the list of the Slow Food association and sponsored by the Liguria Region.

The landscape of the summer pastures of Raschera largely maintains its integrity. The reason lies in the enduring animal farming activities and in the open pastures, though the number of livestock is certainly much lower than in the past. Today, most livestock is cattle, with cows of the Piedmont race, but there are also sheep belonging to the local varieties Frabosana and Brigasca, and goats. Also important is the promotion of the local environment by the Park Alta Valle Pesio e Tanaro, while less convincing are its environmental policies from the perspective of the protection of the traditional rural landscape.

In terms of vulnerabilities, the ecology of these summer pastures depends on their actual usage, which ensures the survival of the pastoral landscape and of its resources.

Recent transformation in the practice of summer pastures and of cheese-making, such as 'improvements' to the grass that introduce new species in the ancient pastures, are also a threat to the traditional landscape. In general, both animal farming and cheese-making practices have been significantly streamlined and modernized starting from the end of the nineteenth century. Where the practice of summer pastures persists, some of the traditional *selle* for cheese storage and *gias* for livestock milking and housing at night are still used. Also, the ecological relations with the ancient 'alps' continue (Fig. 7.1).

7.3 The Plateau of the Vauda (45° 14′ 25″ N; 7° 44′ 04″ E)

The plateau of Vauda extends for about 3,000 ha in the municipalities of Barbania, Front, Vauda Canavese, San Carlo Canavese, San Francesco al Campo, Lombardore, Rivarossa and Rocca Canavese. The area is both private and public and is located at altitudes varying between 200 and 500 m a.s.l. It is roughly bordered to the north and east by the Malone torrent, and to the west by the stretch of plain that includes Leynì-S.Maurizio Canavese-Cirié-Nole-Grosso-Mathi, up to the first rises of Balangero. The plateau of Vauda belongs to the Vauda Natural Oriented Reserve, of about 3,000 ha, and to the SCI Vauda, besides being protected under landscape law 431/85, and including a vast state property (once belonging to the military). The protected area was instituted in 1993 and is administered by the Ente di Gestione dei Parchi e delle Riserve Naturali del Canavese. To reach Lombardore, one can take provincial road SP 267 from Turin, and continue for about 15 km. The geological substratum of the area consists of fluvial-glacial terraced deposits with red-brown clayish paleosol completely decalcified for a depth of about 5 m with rare stones, and by gravel and sand deposits. There are also streams flowing over post-glacial sandy-gravelly alluvial soil. The outline of the plateau is rough and protrudes towards the south-east with an undulated morphology in the inner area.

Besides its historical persistence, the significance of the landscape of Vauda is due also to its particular morphology which isolates its vast surface from the surrounding terrain, as well as to the vast extension of the *incolto* (untilled land), a consequence of the characteristics of the soil, which is rather impermeable and does not lend itself, for the most part, to intensive agriculture. In the more northern part of the area, there are vast woods, mainly made of oaks, alders, and beeches, which tend to thin out towards the flatter central and southern parts. Here extensive patches of plain moorland, with a great varieties of grass species, poplar groves and birch groves, alternate with vast extensions of forage meadows and cultivated areas, especially cereals (corn and wheat, but also, albeit is increasingly limited quantities, rye) and vineyards, alongside specific productions such as chestnuts, walnuts and hazelnuts. Hazelnuts have obtained the PGI label with the name "*Nocciole del Piemonte*". This agricultural system is characterized by a high level of persistence, since it appears to date back at least to the Roman period and was consolidated during the Middle Ages, when written documents attest to the intensive and regulated use of the uncultivated

Fig. 7.2 Typical fallow land of the Vauda plateau

areas and when the place-name Vauda began to be used, from the Germanic *wald* or *walda* (wood). The use of the forests and moorland was the primary concern of the monastery of Fruttuaria, whose interest in the area began in the eleventh century, in terms of both land acquisitions, documented in the case of uncultivated land, such as the *walda de Vulpiano*, cited in a medieval diploma in favor of the cenoby of 1014, and through the establishment of secondary seats, such as the churches S. Solutore and S. Maria Maddalena in Front, and S. Nicolao in Vauda Inferiore. The economic potential of the area led also to an effort to develop agriculture starting from the fourteenth century which culminated, at the start of the modern age, with the foundation of new agricultural settlements ordered by the Doria family in the area that corresponds to the modern settlements of S. Carlo and S. Francesco. In the modern age, although Front was chosen as holiday residence and hunting resort by the Savoia royal family, there was little agricultural or industrial development, which occurred instead in neighboring areas with flat terrain starting from the eighteenth century. The Vauda area remained characterized by small rural settlements and an economy based on family farms.

The Vauda area has retained its integrity not only in terms of the enduring presence of widespread extensions of uncultivated land with limited signs of human presence, but also in terms of the considerable homogeneity in the management of the land, characterized by a well-balanced integration, consolidated throughout the centuries and still quite visible, between meadows, woods, and cultivated areas, in a context of small and medium-size holdings, resulting from the ancient fragmentation of real estate that has characterized the area since the Middle Ages.

The institution, towards the mid-twentieth century, of a military training camp and firing ground, while being a notable intrusion on the traditional arrangement of the land and severely limiting its accessibility, made possible the preservation of its integrity and distinctive characteristics, unlike neighboring flat areas which have suffered from the expansion of the city of Turin and from an intense process of industrialization.

The vulnerability of the area is tied to the gradual sale of state land which could expose the area to real estate speculation. Local administrative bodies along with the administration of the Natural Reserve are taking measures to prevent this possibility (Fig. 7.2).

7.4 The *Baraggia* Land in the Vercelli and Biella Area (45° 33′ 55″ N; 8° 21′ 07″ E; 45° 31′ 22″ N; 8° 09′ 46″ E; 45° 37′ 13″ N; 8° 26′ 28″ E)

The *baraggia* of Vercelli and Biella extends for about 3,000 ha in the provinces of Vercelli and Biella; the area is not contiguous, rather it consists of six subareas, which correspond to the territory of the Baragge Natural Oriented Reserve, instituted in 1992. *Baraggia* is the local name for an uncultivated and scarcely fertile stretch of land, mostly grassland with few trees and shrubs. The largest of these areas is the Baraggia of Piano Rosa, which constitutes the homonymous SCI of 1,194 ha, and falls into the municipalities of Fontaneto d'Agogna, Romagnano Sesia, Ghemme, Cavallirio, Cavaglio d'Agogna and Sizzano in the province of Vercelli. The Baraggia of Candelo, also a SCI, of 604 ha, in the province of Biella, belongs to the municipalities of Candelo, Cossato, Mottalciata and Benna. The rest of the *baragge* are four areas that make up the SCI Baraggia of Rosavenda, in the municipalities of Massazza, Castelletto Cervo, Lessona, Masserano and Brusnengo in the province of Biella, and of Gattinara, Roasio, Rovasenda, Lenta and Lozzolo, in the province of Vercelli. The altitude of the areas is around 200–300 m a.s.l. Many parts of the area are State property and used for military installations. They exist alongside highly subdivided areas of private land, and are partly protected under landscape laws 1497/39 and 431/85. The Baraggia of Piano Rosa can be reached by toll-road A26 exiting at Romagnano Sesia-Ghemme, taking provincial road SP 299 towards Ghemme and turning left on SP 22, which runs through the selected area. The Baraggia of Candelo can be reached from Biella by taking regional road SR 142 up to state road SS 232 and going south towards Castellengo. From here one takes the SP 307 (Candelo-Castellengo) which enters the Baraggia area. Other *baragge* can be accessed through SS 142, turning south on SP 64 at Roasio.

The terrain of the Baraggie is characterized by ample terraces than in many places end with a sheer drop over the plain below. The terraces are formed by a clayey fluvial-glacial substratum altered into a yellow-ocher clayey soil, with a maximum depth of three meters. There are many streams flowing north to south on river beds of fluvial-glacial origin and gray-brown Wurm soil. The soil is generally infertile and impermeable.

The Baragge area are significant as a historically persistent example of the management of the so-called *incolto* (uncultivated land). Many management systems have been adopted throughout the centuries, from semi-free range herding of goats, sheep, cattle and pigs, to the gathering of leaves, heather, dry wood, chestnuts, walnuts and mushrooms, to the management of coppice woods and the programmed

cutting down of high forest trees. From a vegetation perspective, the Baraggia is a moorland with broad-leaved trees, isolated or in groups, a result of the historical agro-silvo-pastoral management of the area through the practice of the *debbio* (fire), deforestation and plowing. Trees include small thin groups of British oaks, sessile oaks, and beeches, which are joined, in the presence of ponds, brooks, and wet zones, by alders, willows and elders, though in the past chestnuts and walnut trees were more common. Late medieval documents, and the much more abundant documents of the twelfth–sixteenth century period, evidence how the *baraziae* were used for various purposes by important monasteries, such as the Benedictine monks of S. Pietro of Lenta and of S.S. Nazario and Celso near Biandrate, and the Cluniac priorship of S.S. Pietro and Paolo at Castelletto Cervo. In was in the Middle Ages that these religious bodies turned the *baragge* into plain stations for the winter pasturing of the herds that during the summer were herded in the mountain pastures of the Biella and Valsesia region. This originated complex and sometimes tense relations with local communities, which had common rights over more or less extensive areas of the Baraggia. In the sixteenth and seventeenth century, local communities increasingly rented vast portions of the *baragge*, once set aside for collective use, to shepherds from the lower mountain areas around Biella. In the eighteenth century, with the growing taxation suffered by local bodies, there began a policy of sale and subdivision of landed properties, while on part of the government began the first efforts, all of them basically unsuccessful, to reclaim and irrigate the land. Only in the twentieth century, a network of canals, built by the Association Ovest Sesia first, and by the Consortium for the Reclamation of the Baraggia later, stimulated rice growing also in the *baraggia*, which in the 1950s and 1970s were subject to a massive work of reclamation and agricultural transformation. The rice produced in the *baraggia* area obtained in 1992 the PDO label 'Rice of Baraggia Biellese and Vercellese'.

The integrity of the landscape of the *baraggia* is limited to a few areas, which were difficult to irrigate and exploit for profitably cultivations. Most of them are near military installations and this turned ultimately into an advantage ensuring the protection of ample sectors of the area. The decline of tradition practices carried out by local communities (mowing, gathering of dung and dry wood, harvesting of nuts and acorns, gathering of chestnuts, pasturing) had not had a marked impact on the habitat of the moorland, whose maintenance is still guaranteed by a traditional intensive seasonal pasturing (herds of sheep from the valleys of Biella, Valsesia and Val d'Aosta), at times still based on the illegal practice of fires used to clear out the land (*debbio*). Presently, the baraggia has taken on its present 'archipelago' configuration, in which the 'islands' extend for a few hundred to several thousand square meters, and are incorporated in the regular network of rice paddies and cereal fields. Directive 92/43/CEE of May 21, 1992 (Habitat Directive) has included all types of 'dry moorland', in which the moorland and the *baragge* of the upper Padana valley are explicitly included, in the Natural Habitats of top community interest.

The area is highly vulnerable and much of the historical landscape has already been lost. The reclamation and the following interventions have significantly modified the flora of the area and greatly diminished the number of species found in the habitat

Fig. 7.3 The rice landscape of the Baraggia

of *baraggia*. The greatest decline concerns plants that in the past were associated with traditional forms of management of the *baraggia* (walnuts, chestnuts, oaks) nowadays abandoned or disappeared; especially in the now abandoned areas where woods are advancing there have been massive infiltrations of new species such as locust-trees (*Robinia pseudoacacia L.*). The presence of military installations has favored the preservation of vast stretches of the *baraggia* saving them from plowing, but on the other hand has damaged the areas, due to explosions, fires and the passing of armored vehicles, which have eliminated the superficial humus stratum (Fig. 7.3).

7.5 Wood of *Sorti della Partecipanza di Trino* (45° 13′ 13″ N; 8° 15′ 29″ E)

The area of the Bosco delle Sorti della Partecipanza di Trino is located in the municipality of Trino, in the province of Vercelli, 2.5 km north-west of the town; the territories are property of a local community known as Partecipanza and extend for 580 ha, mostly located in the plain at 150 m a.s.l., with the exception of the low ridge of Costa of Montarolo which is at 183 m a.s.l. On this area, the Natural Park Bosco delle Sorti della Partecipanza di Trino, was instituted under regional act L.R. 38/1991, followed by regional act L.R. 64/1996. The administration of the park, which extends over an area slightly larger than the woods, is entrusted to the Partecipanza dei Boschi of Trino, nowadays a private company that manages *pro indiviso* the woods and includes all the people who have inherited the rights to the annual distribution of wood (1,272 members by August 2007). It is also listed in the EU list of Sites of Community Importance (SCI) and Special Protected Areas (SPA), and protected under landscape laws 1497/39 and 431/85. From Trino, it can be reached by taking provincial road SP 7 up to Ramezzana, or directly from the town center by taking the 'Strada del Bosco' road. The geological substratum on which the woods

are found consists of clayey alluvial soil and sandy-clayey lens, with red-orange paleo-soil, typical of the entire Vercelli plain, whereas the Dosso di Montarolo is formed by Pliocene conglomerate deposits with scarcely cohesive gravel.

The significance of the area is the result of many elements mainly deriving from the historical persistence of the collective management tied to the Partecipanza. The woods is a mixed formation of oaks and hophornbeam and, to a lesser extent, of alders, closely connected to the neighboring rice paddies, which, by influencing the level of the water-bearing stratum also inside the woods, favor the temporary stagnation of water. The relation has also favored the development of a heron population inside the protected park area. The first historical news probably concern the last quarter of the thirteenth century, when the Marquis of Monferrato (1275) granted the inhabitants of Trino the right to use the woods as coppice (*nemora comunia remaneant in comune Tridini*). The birth of the Partecipanza resulted from a consistent immigration that opposed the old inhabitants of Trino to the new arrivals towards the end of the fifteenth century. The term *partecipantia* is attested already in 1528 and to the same year is dated the first collection of statutes, including that of the *bosco delle sorti*. Towards the second half of the eighteenth century, the town of Trino ceded the property of the woods, but acquired the right to administrate the Partecipanza through a new body called the "Consiglio di Cumulativa Amministrazione" (Council of Cumulative Administration). There is no doubt that this unusual system of collective management is the reason the woods escaped the agricultural transformations that have characterized the area of the low lands around Vercelli. The institution of the park in 1991, which also includes the Abbeys of Lucedio, of Montarolo and of Madonna delle Vigne, is evidently part of an effort to mediate between the traditional management of the area and its protection, but in a first phase (1977) the project fell through precisely because of the resistance of the Partecipanti. This is also the reason behind the reforestation of the lands which had been transformed into rice paddies in 1868. In the paddies around the woods the "Traditional rice of the Po valley" is produced, recognized as Traditional Food Product by the Ministry of Agricultural Alimentary and Forest Polices.

The woods of the Partecipanza di Trino certainly retain their integrity, at least from the perspective of the extension. Every year, members have the right to cut the wood in a specific sector of the woods, which is further subdivided in a number of sub-areas called *sorti* or *punti*. Members participate in a lottery and are randomly assigned one of the *punti*, from which the name 'Bosco delle Sorti' (The Woods of Luck). The cutting down of high forest trees was in the post-WWII period the main source of income for the members of the Partecipanza. Later, high-forest was replaced, especially in the 1970s and 1980s, by coppice. Obviously the woods represent the historical left-over of an ancient and nowadays obsolete if not completely non-existent form of ownership, rather than an example of an original ecosystem, although, in the context of a plain subject to intensive agriculture, the area retains an environmental value.

At the moment there appear to be no elements of vulnerability or concrete danger. A possible problem could be the forestation plans by the Park administration, whose goal is the 'readjusting' of the balance of the plain woods, to recreate its supposed

Fig. 7.4 Traditional structure of a coppice wood in the area of Partecipanze di Trino

original condition (rediscover its plain identity), and as a protection against further real estate speculation. In fact, the woods are evidently the result of an historical human activity and even its possible transformation into a purely natural resource would not alter its importance as evidence of an historical landscape (Fig. 7.4).

7.6 The San Michele Farmhouse (44° 49′ 00′ N; 8° 39′ 15′ E)

The typical landscape of the farmhouses (*cascine*) of the Alessandria area is found in a flat district of alluvial origin whose borders are marked by the rivers Bormida, Tanaro, Orba and Scrivia. The area of the Cascina San Michele, in the municipality of Bosco Marengo, province of Alessandria, is private property and extends for about 250 ha, at an altitude of 120 m a.s.l. The area belongs in part to the protected areas Torrente Orba Natural Regional Reserve, which is also a SCI and a SPA, and Po and Orba Park Fluvial Park. It was the first Piedmont park to obtain the environmental certification UNI EN ISO 14001 and is protected under landscape law 431/85. Bosco Marengo can be reached from Alessandria by going south on provincial road SP 185 up to Casal Cermelli and then taking the SP 181 for Bosco Marengo for 3.5 km. Before entering the town of Bosco Marengo one takes via Manlio and at the end turns right on Strada San Michele; following this road, after 1.7 km one reaches Cascina on the right. The geological substratum of the area of Cascina San Michele in the part towards the Orba torrent is formed by post-glacial alluvial soil and in the part towards Bosco Marengo by prevalently clayey alluvial soil.

The significance of the area lies in the historical persistence of one of the typical farmhouses of the Alessandria plain, both in terms of the cultivations, mainly cereals and corn, and in the structure of the farm. On March 26, 1566, the land of San Michele was acquired by the convent of S. Croce, established in Bosco Marengo by pope Pius V, and eventually became one of the most important farms of the convent. Its existence is attested at least since the late Middle Ages, its ownership by the Cistercian order being repeatedly stated in local histories, and confirmed

Fig. 7.5 Aerial photograph of the San Michele farmhouse

by twelfth-century documents mentioning the famous monastery of Civitatula or of Tiglieto, in the upper Orba valley. After 1580, the land of S. Michele already appears organized as a major holding. The position of the residential building corresponds to late Renaissance architectural and agricultural criteria, which recommended that buildings face eastward. Its present layout is a result of additions made at various stages. Alongside the main residential building and the stables, there must have been a number of rural houses presumably built after 1566; the construction of the houses for resident farmhands can instead be dated to the end of the sixteenth century and precisely to the 1586–1588 period, when the holding was directly managed by the Convent of S.Croce. When pope Pius V died, the *cassina* of S. Michele extended for about 2,800 *moggia* (approximately 1,500 ha). This vast land was made up mostly of crop land and meadows, mostly irrigated and highly fertile, and by pastures. The vast estate had water-works used for irrigating the fields and for powering mills. Specifically, the water for S. Michele comes from a dike from which the water goes into a canal and then through brick canals or through ditches it reaches the fields. From here, thanks to an apposite leveling of the land and to draining ditches it returns to the ditch of S. Michele to irrigate the land further down the hill. Among the many artifacts still in excellent condition, there is the ice-house, dating back to the time of the Dominican monks of S. Croce (around 1570). At the start of the seventeenth century, the *cassina* of S. Michele included, besides rural and residential buildings, the ancient mill *del tiglieto*, next to which a olive-oil press and later an hydraulic saw-mill (locally known as *resiga*), abandoned towards the mid-eighteenth century. Due to the Siccardi law, in 1870, ownership of the "Tenuta S. Michele" went from the clergy to a family of Alessandria named Chiozza Frova. Since 1966, it belongs to the family of Giovanni Mignone, which still lives on and manages the property.

The integrity of the *Cascina* depends mainly on the existence of the building and on the continuation of farming, which in the last decades has become increasingly difficult. The family that owns the place, residing there and working the land, ensures the maintenance of the historical buildings, along with the more modern and functional ones, such as stables and drying chambers for cereals. The holding of S. Michele participates in the project 'Cascine Aperte, per le corti della pianura alessandrina' (Open Farms, in favor of the 'corte' farms of the plain of Alessandria) promoted by the Councilship for Agriculture of the Province of Alessandria to further the knowledge not simply of rural areas and local food products, but also of cultural traditions and life-styles that have survived to the present day.

The area is vulnerable to changes in the cultivation system, which has already compromised the original aspect of the agrarian landscape. These transformations have involved most of the plain area, not limitedly to the plain of Alessandria, and only a few residual elements of the historical agrarian landscape survive. Other potential dangers are possible changes to the buildings of the *Cascina*, which could alter their historical characteristics (Fig. 7.5).

7.7 The Wooded Pastures of Roccaverano (44° 35′ 21″ N; 8° 16′ 20″ E)

The area corresponds to a selection of the pastures located in the south of the provinces of Asti and of Alessandria. It extends for about 3,000 ha in the municipalities of Olmo Gentile, Roccaverano, San Giorgio Scarampi and Mombaldone, in the province of Asti, and Denice in the province of Alessandria. The area, located at altitudes varying between 400 and 800 m a.s.l., belongs in part to the SCI Langhe of Spigno Monferrato, and is protected under landscape law 431/85. Most of the area is private pasture and only some fragments of the original common lands that still existed towards the end of the nineteenth century still survive, most of them along ridges. The pastures can be reached by taking state road SS 30 Val Bormida and exiting at Montechiaro Piana, from which one reaches Denice after 4 km; to reach Mombaldone one continues on provincial road SP 30 towards the south for another 2.2 km, turns right on via Regione Bricchetto and continues for 1.5 km; alternatively, one can take the SP 25 and exit at Vesime, then the road leading to San Giorgio Scarampi (6 km) first and then that leading to Roccaverano (another 4 km). The geological substratum consists of the Formation of Cortemilia, characterized by gray sandstone in beds of 10–40 cm, alternating with gray-yellow sand in beds of variable thickness. There is also a minimum quantity of marl and gray-blue clayey marl, frequently alternating with sandstone and gray-yellow sand. On the more eroded slopes some *calanchi* gulleys are present. This hilly area is surrounded by the basins of the rivers Belbo, Bormida di Spigno and Erro. Its slopes are steep and those facing south-south-east are terraced.

The significance of the area lies in the historical persistence of a landscape of vast open pastures, created by centuries of agro-silvo-pastoral practices. The pastures are

Fig. 7.6 Pastures play an important role in the mountain landscape, but they are constantly shrinking

mostly located at the top of the hills, while the steeper slopes, where many terraces are found, are nowadays used almost exclusively as vineyards and meadow-pastures. The areas reserved for the woods were limited to the banks of the torrents and the steeper slopes; the foliage for forage, used for goats and collectively managed, was mostly harvested from individual trees found in the wooded meadows and amidst the hedges. The small settlements, which are the seats of the municipalities of the area, date back to the Middle Ages, though a certain expansion of the settlements towards the mid-fifteenth century is well-documented. The scattered settlements documented already since the sixteenth century continued until the mid-twentieth century, when the industrial centers of the Bormida valley and the construction of state roads and of the railway caused the productive centers of the area to be moved to the valleys. Around the settlements there are many vegetable gardens and small vineyards combined with other cultivations. The local *robiola* cheese was assigned the PDO "Robiola di Roccaverano" on July 1, 1996, and is today also on the list of the Slow Food association. This official recognition has supported local agricultural practices while also altering to some extent its characteristics in order to comply with the criteria of the PDO.

The integrity of the area has been largely maintained, and while the population has there has been steadily decreasing, especially since the 1960s, woods and scrubland have not completely replaced pastures. The pastures that are still used are still characterized by a complex environment, which translates into a high level of biodiversity. This is the case, for example, of the submunicipality of San Gerolamo, in the municipality of Roccaverano, where a specific production of Robiola cheese is still present. The scenic and botanic value of this locality, which we present as an example of the pastures of Roccaverano, is associated with traditional agriculture, although the integrated cultivation and animal farming system (cattle but especially goats) has been sharply declining since the second half of the twentieth century.

The greatest threat to the landscape of the pastures of Roccaverano lies in the abandoning of traditional activities associated with shepherding and to its direct

consequences. Nowadays, the ditches and the steeper slopes have been abandoned and colonized by the woods, turning into an unused biomass which can cause fires and hydrogeological instability. Only in the 'islands' in which goats are still herded to produce milk and cheese, the weeds are still kept under control and the biodiversity is preserved. On the slopes no longer used as pasture, woods began expanding already towards the end of the nineteenth century, replacing fields and vineyards, whose combined presence is attested towards the mid-nineteenth century. The decline of agriculture has also caused a decline in the number of flowers species that characterize this rural landscape. The recognition of the Robiola PDO, while on the one hand acknowledges and protects a typical product, on the other hand does not suffice to protect the agro-silvo-pastoral integrated system that characterized the area up the 1960s, since it is a measure limited to cheese production (Figs. 7.6, 7.7).

Land use 2009	Surface (ha)	Surface (%)
Urban area and courtyard	46.46	4.29
Arboricolture	9.71	0.90
Shrubland	30.70	2.84
Woodland	566.25	52.33
Badland (*calanco*)	47.46	4.39
Fruit orchard	10.98	1.01
Unproductive	1.82	0.17
Fallow	13.52	1.25
Vegetable garden	1.84	0.17
Pasture	19.38	1.79
Wooded pasture	37.18	3.44
Shrub pasture	20.76	1.92
Meadow	55.58	5.14
Meadow with tree	1.56	0.14
Pasture and meadow	39.91	3.69
Terraced pasture and meadow	84.71	7.83
Afforestation	7.46	0.69
Arable land	127.06	11.74
Vineyard	7.26	0.67
Total	1082.14	100

Evaluating indices of landscape	
Number of land uses	18
Number of patches	775
Total surface area (ha)	1082.14
Average surface area of patches (ha)	1.40
Average surface area of forest patches (ha)	3.21
Average surface area of pasture patches (ha)	1.20
Hill's diversity number	1.18
Class of landscape integrity (I–VI)	II

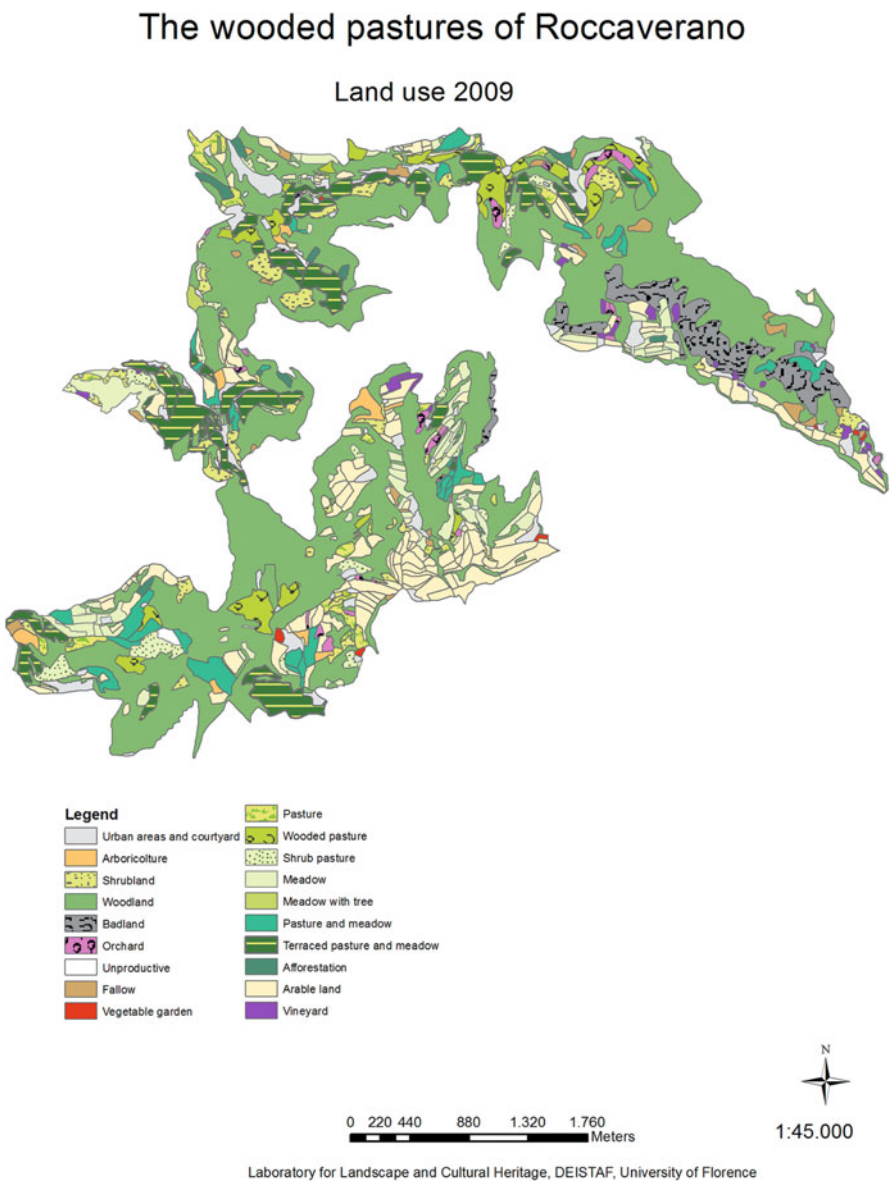

Fig. 7.7 The area of Roccaverano is historically characterized by pasture and terraced meadows. The pastureland accounts for 260 ha (25 % of the area). This land use can be divided into 33 % of terraced pastures, 21 % of meadows, 15 % of mixed pasture-meadows, 14 % of wooded pastures, 8 % of pasture with shrubs, 7 % of pasture and 0.6 % of wooded meadows. The integrity of the landscape it is reduced because secondary woodland today accounts for more than half of land use (52.3 %)

7.8 Historical Polyculture of Valle Uzzone (44° 29′ 15″ N; 8° 11′ 44″ E)

The traditional polyculture areas of Valle Uzzone, in the municipalities of Castelletto Uzzone, Pezzolo Valle Uzzone, Bergolo, Levice and Gottasecca, includes private areas and a few town woods, of which the Bosco dei Faggi, in the municipality of Castelletto, is the largest (about 35 ha). The areas extends for about 2,600 ha, at altitudes varying between 250 and 700 m a.s.l. The area is protected under landscape law 431/85. It can be accessed from the Liguria region by taking provincial road SP 9 (which turns into SP 52 in Piedmont) from Cairo Montenotte, or by taking SP 52 in Piedmont at Cortemilia, and going south across the bottom of the Uzzone valley; a series of secondary access routes at square angles with SP 52 connect the valley to the towns on the ridge. The dominant lithologic formations are marls of the Miocene epoch, present in stratifications of sand, sandstone and clay in most of the territory, with alluvial deposits of clay, sand and silt at the bottom of the valley. It is overall a scarcely cohesive formation, which historically has caused, besides the formation of *calanchi* gullies, repeated landslides which are still frequent. The torrent Uzzone runs through the valley from north to south. There are also many secondary streams (locally known as *riàn*), which run down from the ridges creating a dense system of secondary ridges usually steeper towards the south.

The significance of the area lies in the historical persistence of polyculture, which create a composite and perfectly balanced landscape, in which small agricultural areas alternate with wooded areas and meadows, enriched by historical settlements and terraced slopes. Cultivations include cereals, vegetables, vine and fruit. Other typical products include Robiola cheese, eggs, dried chestnuts and wool. A small number of cattle are also farmed, and used for milk, meat and in the past as work-animals. There are also poultry, sheep and goats, which pasture in the *gerbidi* (moors). These activities support the existence of the local population, notwithstanding the adverse economic and political conditions. The valley was inhabited already in the Paleolithic and Neolithic period by Ligurian populations. Throughout the centuries, it was exposed to various cultural influences, but was also geographically very isolated. Up to the early twentieth century, to travel through the bottom of the valley one had to pass a number of fords. The valley was controlled at various times by the Romans, the Goths, the Longobards, and the Saracens present on the coast. Towards the end of the tenth century it was conquered by the Aleramici family; later it became part of the marquisate of Savona, and became part of the kingdom of Savoia during the eighteenth century. Being remote from central power and at the margins of two regions, local communities (which did not correspond to the modern municipalities) were usually quite autonomous. The language shows many signs of Ligurian influence. The typical agriculture was polycultural and aimed at personal consumption, whose presence is dated since the fifteenth century. For centuries, the communities of the valley shared the same techniques, family modes and moments of collective labor (beating, threshing, grape-harvesting, road maintenance). In this context, the traditional local farmhouse (*cascina*), which combines traits typical of the Piedmont plain farmhouse with others typical of the Ligurian Apennine, played a central role.

Isolated or combined to form small settlements (locally known as *borgà*), connected by a thick network of country roads, the farmhouses were generally located on secondary ridges, on the more solid terrain, near springs or creeks, and cultivatable land, including steep slopes terraced with dry-stone walls. Sandstone, along with chestnut wood, was the main building material for the terraces and for the farmhouses themselves. The typical local farmhouse The basic unit is composed by a room on the bottom floor, and a room on the first floor which can be accessed directly thanks to the steepness of the terrain, still to be found as rural building (*ciabòt*). The minimal farmhouse is composed by two rooms on the bottom floor and two rooms on the first floor, connected by an exterior stair and its wooden gallery linked to the roof, which sometimes has been later also transformed into a stone structure with a double order of arches. Further developments of the farmhouse see an L plan with a stable and an upper hay-loft. Attached to the farmhouse are the well, the oven, the drying chamber for chestnuts and the cellar. Even in the case of larger holdings, it is the number of farmhouses that increases while the size of each farmhouse remains suitable for a single extended family, in line with the sharecropping system. The structure of the historical landscape, based on the farmhouse and the surrounding mosaic of cultivations, is patterned by the succession of settlements, gathered around castles or feudal palaces, and framed by the *calanchi* gullies at the bottom of the valleys, the chestnut groves at the top of the hills, and the lines of terraces that connect the entire system.

The scenery of Valle Uzzone has basically retained its integrity and its historical identity can be easily perceived, except in some areas at the bottom of the valley where new settlements have developed. Polyculture, though less complex than in the past, is still present in many areas, and ensures the preservation of an aesthetic and cultural heritage that would otherwise be lost forever. A good portion of the houses is still inhabited by owners who work the land and the houses in the towns in recent decades have been restored and re-inhabited, at least part of the year, by returning emigrants, while the more isolated and poorer farmhouses have been restored mainly by foreigners, though no agriculture is practiced.

The greatest threats lie in the abandoning of traditional practices, which have already occurred in the more marginal areas. Since the 1950s, emigration towards industrial centers has resulted in the abandoning of agriculture and the consequent expansion of wooded areas, especially in the steeper, albeit often terraced, areas. Most of the pre-existing chestnut, downy oak or beech woods, once used for pasture or to gather leaves to be used as litter for the animals, ceased to be maintained and gradually turned from coppice into high forest. The trees no longer slow down the course of water and this leads to disastrous floods, as in 1994. In general, the lack of maintenance of the slopes and of the water-works increases the danger of landslides and hydrogeological instability. While the farmhouses in which the land can be easily cultivated using mechanical means are still active, there have been notable changes in the structure of the cultivations (from polyculture for personal use to cultivations produced mainly for the market: cereals, hazelnut groves, hay) and in the architecture of the buildings. Interventions on buildings in the last decades have seldom maintained the original shapes and materials. In some cases, new buildings with different materials and structures have been built alongside the partly-abandoned

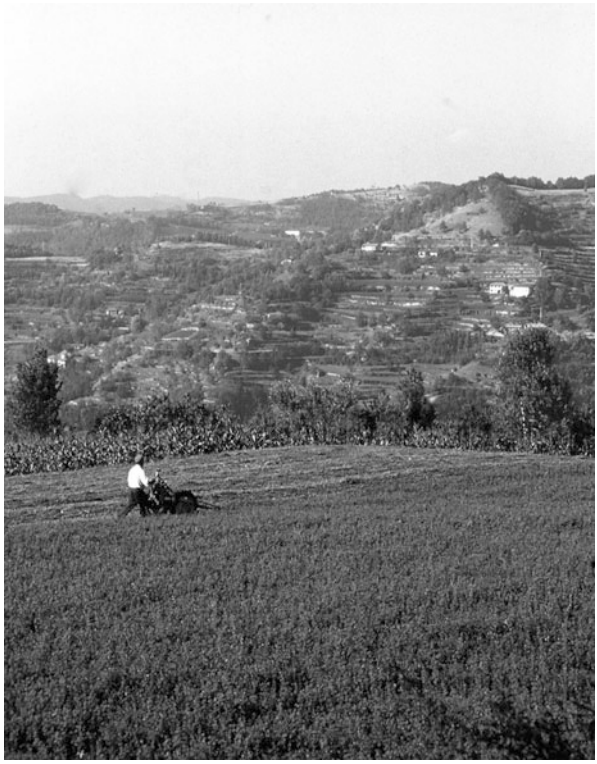

Fig. 7.8 Polyculture in the striking terraced landscape of Valle Uzzone in Alta Langa

old building. The use of farmhouses as holiday houses helps preserve the buildings but does not stop the advance of the woods. The codification and promotion of the landscape of the valley is essential to rediscover the complexity of the knowledge and practices that for many centuries ensured a degree of relative comfort to inhabitants in a difficult land, subject to frequent changes in political power but basically left to fend for itself (Fig. 7.8).

7.9 The Galarei Vineyard (44° 38′ 42″ N; 7° 59′ 03″ E)

The holding Tenuta of Fontanafredda, where Galarei Vineyard is located, extends for about 100 ha in the municipalities of Serralunga d'Alba and Diano d'Alba, in the province of Cuneo. The area is private property, polyculture is present. The altitude varies between 200 and 350 m a.s.l. Part of the area is protected under landscape law 431/85, specifically the area within 300 m of the Castiglione torrent. The selected areas can be accessed from the entrance of the holding of Tenuta of Fontanafredda on provincial road SP 125 (Via Alba). From here the various vineyards of the farm can be reached. The vineyards are located on a geological substratum that consists of

a formation called Marne di Sant'Agata Fossili, made of marl and gray silt—clayey marls, sometimes blue, and gray-white in surface, homogeneous and plastic.

The area is quite small, but it is significant not only for the historical value of the holding and of the cultivations, but also because of a vineyard of 0.41 ha called Vigna Galarei, which is of particular historical interest. The name comes from the woods of Gallareto, eliminated in the mid-nineteenth century to make room for the vineyard, while the denomination refers to an old well dug by hand and shaped like a demijohn. It is a tiny fragment in a territory where modern specialized viticulture has profoundly altered the landscape. Its importance lies in its historical value and in its preservation ensured by a winery that has a long-standing tradition especially in the production of Barolo one of the most important and well known Italian red wines. The cultivation of wine-grapes is attested only since the seventeenth-eighteenth century. The most recent studies date the origin of the development of the Barolo wine to the purchases made in 1858 by the Real Casa, the planting of new vineyards in 1863–1864 and the ensuing collaboration with royal winery of Pollenzo. However, it was only after 1878, when the winery became autonomous with the name *Casa vinicola Emanuele di Mirafiore,* that the evolution that led to the commercialization of the Barolo throughout the world began. In the first two decades of the twentieth century, the management by Count Gastone of Mirafiori and by the director Mollo led to a further expansion, not only of production and distribution, and also of the entire structure. Besides Villa Reale and the winery other residential buildings were erected and old ones were enlarged. Fontanafredda had an oven for bread, an elementary school and a church, and was practically a tiny village with a population of more than 200. In 1928, the holding of Fontanafredda was subject to a first major infestation by phylloxera. Even more damaging, however, was the world-crisis of 1929 and the two events led to the failure of the winery which in the meantime had changed its name to 'Mirafiore Vini Italiani'. The Monte dei Paschi di Siena bank acquired the winery and, relying on the technical expertise of the new director and wine-expert Giuseppe Bressano, began the re-plantation of the vineyards and resumed wine production with the new name 'Tenimenti di Barolo e Fontanafredda'. The historian Fantini already in 1894 described Fontanafredda as a model holding and observed that 'Italy may number larger holdings, but certainly none better cultivated and deserving to be visited by those who dedicate themselves to viticulture'. Fantini also describes a type of vineyard used in Fontanafredda which had been imported from France with 'vines set one meter apart in all directions, always in rows' and with a supporting pole for every vine and pruning 'at two or three spurs of 3–4 buds'. In any case, specialized viticulture appears to have been systematically introduced to Fontanafredda only in the last three decades of the eighteenth century: previously vine was cultivated in a quite different fashion, the main system being that of the *vite maritata* ('wedded' vine) of Etruscan origin, in which trees are used to support the vine which is attached at a high level. The most ancient landscape of the hills of Fontanafredda, before the 1864–1865 period when the first modern vineyards were set up, was one of meadows, woods, fields and *vite maritata* vineyards. The photos of the early twentieth century, show instead rows of vines supported by chestnut poles, with two metal wires and reeds, following one of the variants of the Guyot system.

The rows are still rather widespread with fruit trees at the extremities and a certain presence of polyculture. Besides the vineyards, an important element is the Bosco dei Pensieri: a rare, and perhaps unique, example of *Langa domestica*, in contrast with the *Langa selvatica*, located inside a major farm. This wood, which extends for about 9 ha, has been endowed with a didactic itinerary with many panoramic spots and panels with literary and historical comments on the environment and landscape of the Langhe area. The wines produces inside the holding are of outstanding quality and include the Barolo DOCG (Controlled and Guaranteed Origin Denomination), the Dolcetto d'Alba DOC (Controlled Origin Denomination), the Moscato d'Asti DOC and the Nebbiolo DOC. The entire holding of Fontanafredda after having belonged to king Vittorio Emanuele II, then to the Counts Guerrieri di Mirafiori di Fontanafredda and, after 1932, to the Monte dei Paschi of Siena bank, since July 2008 belongs to the Eataly company and to the Foundation Monte dei Paschi.

Concerning integrity, the landscape of the holding of Fontanafredda maintains only small fragments of the historical characteristics of the vineyards of the Langhe area. Nowadays, the holding occupies a total of 100 ha, of which 85 are vineyards. The more recent vineyards have been based on a criterion of 'ecological' compatibility which, in recent years, both in regards to the fertilization and protection of the vineyards and the soil, and in regards to the wine-making process.

However, the landscape remains highly vulnerable, the greatest threat being the increasing and apparently unstoppable process of specialization, which is quite visible in the surrounding landscape. This process has affected most of the wine districts of Italy and only in some areas owners have maintained or tried to restore the traditional cultivations methods (Fig. 7.9).

Land use 2009	Surface (ha)	Surface (%)
Water body	0.16	0.11
Urban area and courtyard	4.47	3.03
Farmhouse and historical building	4.28	2.90
Arboricolture	1.01	0.69
Woodland	6.85	4.64
Bosco dei Pensieri	9.41	6.38
Fallow	3.18	2.16
Hazelnut orchard	14.06	9.53
Vegetable garden	0.13	0.09
Wooded pasture	0.50	0.34
Arable land	7.81	5.29
Vineyard	95.25	64.57
Historical vineyard	0.41	0.28
Total	147.52	100.00

Evaluating indices of landscape	
Number of land uses	10
Number of patches	262
Total surface area (ha)	147.52
Average surface area of patches (ha)	0.56
Average surface area of arable land patches (ha)	0.51
Average surface area of forest patches (ha)	1.81
Hill's diversity number	3.88
Class of landscape integrity (I–VI)	I

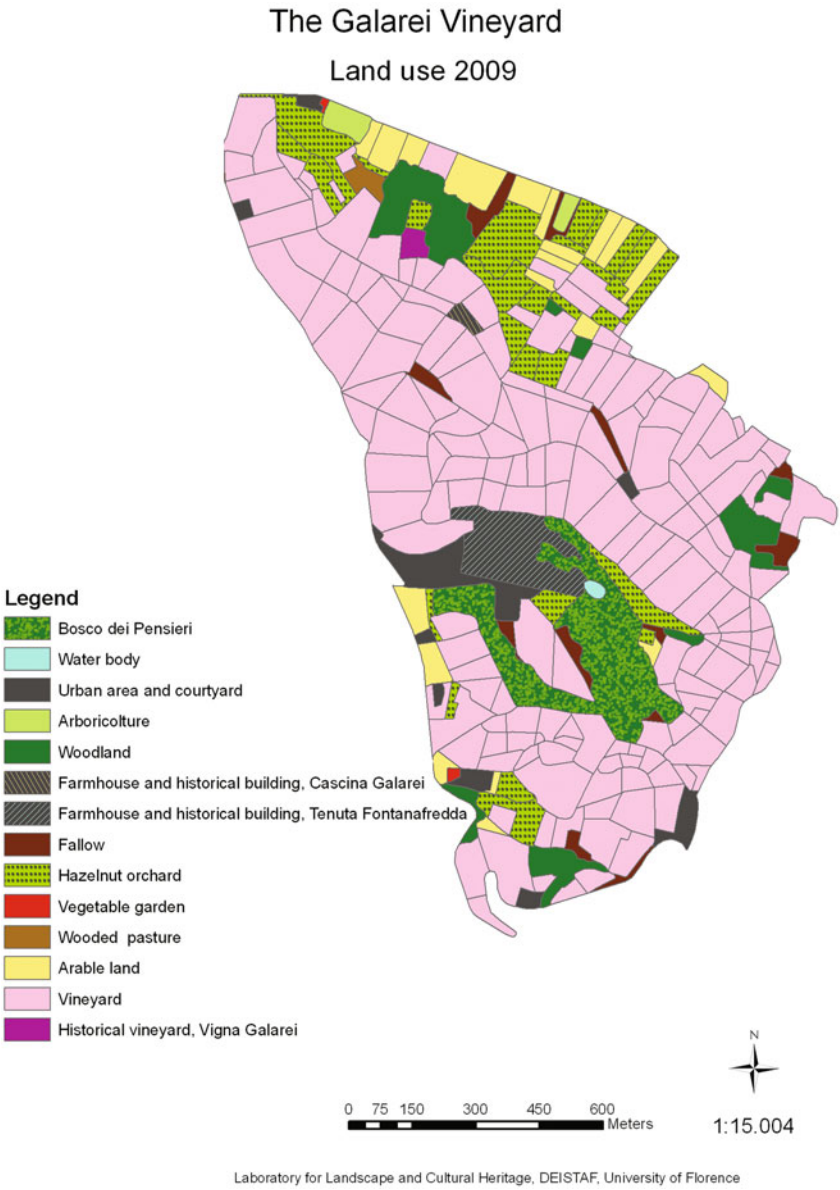

Fig. 7.9 The estate of Fontanafredda, where the Gallarey vineyard is located, is considered one of the homelands of Barolo, one of the most famous Italian red wines. It is an example of a highly specialized modern wine farm, where some elements of the previous historical landscape are still preserved. The area shows modern vineyards on 64.8 % of the surface, of which only 0.4 ha are occupied by the historical *Galarei* vineyard. Specialization has affected most of the historical wine areas in Italy. Here, too, vines were trained on trees such as maple, poplar or elm, following the ancient Etruscan tradition, and combined with other crops. In Fontanafredda this transformation started already in the eighteenth century, while in other parts of the country it occurred only after 1970. Nevertheless, there are still vineyards in the Etruscan or Greek style in Italy (see the *vite maritata* near Naples), showing that production according to traditional practices is still possible even today

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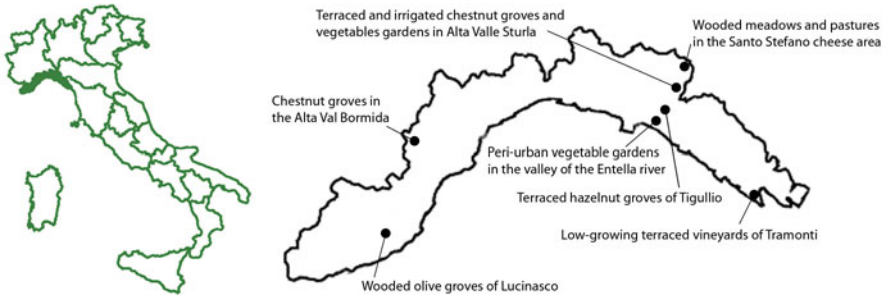
Chapter 8
Liguria

Diego Moreno



8.1 Introduction

In Emilio Sereni's 1961 pioneering study, the agrarian landscapes of Liguria are hardly mentioned. In general, however, after its French and English translations, Sereni's text has become a mandatory reference in Europe for any discussion of the Italian rural landscape. This does not hold for the more scientific and technical studies (lacking any an historical approach), which, starting from the mid-1970s, have continuously inspired the legislation of the Liguria region on its cultural, scenic and environmental heritage. As a consequence, years of careful management of a mosaic of historical rural landscape, exercised in various post-agricultural forms, have been obscured by a simplistic approach aimed at 're-naturalizing' the land by the legislation on regional natural parks (but also by that on forests). The problem is even more notable if we consider that woods occupy a surface of 69 %, while agricultural surface is only 11.5 %, figures strongly influenced by the forestation that has occurred following the abandoning of agricultural and pastoral activities in the twentieth century. In regards to the regional landscape plans, the legislation has

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been excellent, but as far as concerns the rural landscape and heritage it continues to disregard the lesson of Sereni. In Sereni's 1961 study there were a few references to the development of the 'Genoan villa' in the sixteenth century and possibly to the model of the Mediterranean semi-urban *huertas* but, fatally, there was no image documenting in any way the agrarian landscape of Liguria. Yet, Sereni must have known this landscape. Indeed, his previous 1955 study was paradoxically focused on Liguria and its rural communities in classic antiquity, and here Sereni found time to prove himself also as landscape photographer. Why then this invisibility of the rural landscape of Liguria?

One reason lies in the reformist attitude of the 1950s, whose aim was the modernization of Italian agriculture and, explicitly, of its rural landscape. From this perspective, the agriculture of Liguria seemed a fragile and obsolete remain of the past, marked by fragmentation and archaic technical and social features, on its way to oblivion, like all traditional agricultural economies in Italy. On the other hand, the idea of an agriculture struggling against a hostile environment—with all the rhetoric of the toil of constructing terraces—persisted before and after Sereni's studies. It continues to inspire scientific literature and along with it the rare initiatives aimed at preserving and promoting the landscape, which have inevitably centered on this 'monumental' aspect of the rural landscape of Liguria. The above, however, corresponds to a geographical pseudotruth, monotonously repeated for over a century, but having no foundation in the agrarian studies that preceded industrialization, which were still interested in performing an actual inventory of the complex resources offered by agriculture, shepherding and forestry. This ideological block has remained unmoved by the only existing regional monographic study on the agrarian landscape, directly inspired by Sereni's work: in 1973, Massimo Quaini identified the documentary and cartographic sources necessary for reconstructing its features and historical development. The development of new investigation techniques for an historical approach to the ecology of cultural landscapes, based on the analytic study of individual sites, made it possible to overcome the fundamental limitation of Sereni's work, that of using the present landscape, in itself, as an historical document. In recent decades, new sources on the history of the landscape and rural settlements in Ligura have been identified through studies by geographers, archeologists and botanists on rural archeology and especially on the archeology of environmental resources. Soils, plants, waters have been studied in terms of their capacity to document the historical transformations in local use and activation of resources. It is a tenuous reflex of the fact that the disappearance of traditional rural landscapes that had been predicted in the years of the industrial development of the region, and taken for granted in the following decades, has in fact occurred only in part. Traditional rural economy has indeed largely disappeared, but from the perspective of regional environmental resources the loss was neither sudden nor absolute. Instead we have been left with the problem of a significant cultural and environmental heritage, represented by the region's historically significant rural landscapes. This heritage is being increasingly fragmented and is threatened with extinction. It still includes productions, practices and local agricultural knowledge, and to a more limited extend, visible examples of rural landscape. In Liguria, there still is no adequate policy for its preservation

and promotion. For this reason, the rural areas presented here have been chosen because they are still characterized by historical significant and still functional environmental and economic relations, which have endured even if in different and necessarily changing forms. Our purpose has been to demonstrate, through a series of very limited examples compared to the possibility of a systematic exploration of the regional heritage, they way in which the activities typical of traditional agricultural-pastoral-forestry economies can maintain and activate landscapes and environmental resources. This is the case for example of the meadows-pastures with trees used for cheese production in the upper Val D'Aveto, in which the local economy guarantees, actually had guaranteed until recent years, the complex biodiversity of the flora of these areas and the preservation of local varieties and their landscapes, as is also the case of the semi-urban horticulture in the hazel woods of the Chiavari area. Some areas evidence the ability to find new markets for local production, as in the case of the chestnuts of the 'gabbiana' variety in the sub-municipalities of Borzonasca. The wood-patterned olive orchards of the Valle del Maro, document the fundamental historical function, as well as the present role, of common rights (*comunaglie*) over fields and forests in shaping and maintaining rural landscape. The vineyards of Tramonti attest to private individual initiative in local farmers and their capacity, perhaps their stubbornness, in resisting economic, environmental and agricultural choices that do not take into account the history of rural landscapes and their role as environmental systems. We are dealing in various cases with small landscapes, fragmented into small non-contiguous areas, which makes it difficult to identify large areas in the region in which the landscape has retained its integrity. This problem attests to the effects of the transformations that agriculture has undergone, which makes the safeguarding and promotion of surviving historical landscapes even more urgent.

8.2 Chestnut Groves in the Alta Val Bormida (44° 15′ 23″ N; 8° 09′ 44″ E)

The chestnut orchards of the Alta Val Bormida (upper Bormida valley) area actually consists of a series of smaller areas where chestnuts have been traditionally grown. It extends for a total of about 90 ha, located in the municipalities of Calizzano, Murialdo, Bardineto, Osiglia and Massimino. The area is part of the vast mountain territory of the Comunità Montana Alta Val Bormida, on the side of the province of Savona towards the Padana plain. The area is mostly privately owned and located at altitudes between 600 and 1,100 m a.s.l. Part of the area lies in the territory of two sites of the Natura 2000 network and is protected under landscape law n. 1497/39 and n. 431/85. The chestnut orchards can be accessed through provincial road SP 490 which goes from Finale Ligure to Calizzano; from Calizzano you take the road south of the town which goes into the valley; after 3 km you reach Mereta and after another 3 km Bardineto. If instead you continue north on SP 490 past Calizzano you reach Massimino after 15 km. The other chestnut orchards can be reached by exiting

at various points the streets that connect the various towns. The geology of the area is complex and variable. The southern part of the area has a substratum made partly of varyingly gray calcareous dolostone, partly by white and green quartzites and by finely grained porphyroids. The substratum of the northern part of the area consists of the 'Ollano' Formation, of the upper Carboniferous age, formed by mainly siliceous conglomerates, sandstones, phyllites, and mica scists.

The significance of the area lies in the historical persistence of traditional chestnut orchards and in the importance chestnuts have had for local economy, beyond mere subsistence. This continuity is shown by the fact that farmers nowadays still cultivate the 'gabbina' chestnut, a typical local variety. The landscape is characterized not only by the presence of chestnut, some of them of monumental characteristics, but also by that of small isolated rural buildings, situated on small clearings, where a single family usually lived growing vegetables, and fruit or olive trees, for its own use. There also are stone or solid brick constructions used for exsiccating chestnut (known as *tecci*). These can be either isolated or integrated in the houses and consist of a single room in which there is a central open chimney and, at about 2–3 m from the ground, a roof of wooden lattices called *graia.* In the upper Bormida valley and in neighboring valleys, chestnut orchards where grown for commercial purposes, as opposed to self-consumption, already in the Middle Ages. Nowadays, it is difficult to establish the position and extension of the areas cultivated in the Medieval period, due to the strong expansion of chestnut orchards on the entire eastern slope between the sixteenth and seventeenth century. Towards the end of the nineteenth century, the high forest orchards used for producing chestnuts were largely replaced by coppice orchards, used for the production of poles for vineyards or firewood. The Bormida valley is today one of the most wooded areas of Italy, where forests make up more than 70 % of the territory. This is mainly the result of the abandoning of agriculture and shepherding. Chestnuts remain the most common tree. The economic and social development of the Bormida valley has practically caused the disappearance of chestnuts as an element of the local diet of which it was once the main staple. However, in the municipalities of Calizzano and Murialdo, chestnut farming has survived and nowadays is once again commercialized, though in a geographic area much smaller than in past centuries. The woods in this area consist essentially of high forests of chestnut trees of the variety 'gabbina' (or 'gabbiana'), with an insignificant percentage of other varieties with similar characteristics, sometimes present because of past reforestations, which are often difficult to identify ("frattona", "siria", "ciapastra", "spinalunga", etc.). The 'gabbiana' chestnut is recognized as a Traditional Agroalimentary Product by the Ministry of Agricultural, Alimentary and Forest Politics, and since 2002 it is one of the quality products chosen by the Slow Food association.

The landscape associated with the 'gabbiana' chestnut appears to have largely retained its integrity. In general, the abandoning of chestnut growing has caused the gradual transformation of the chestnut orchards into woods in which also other species are presents, aside for the transformation of chestnut orchards into coppice woods. Though the total extension of the area is quite limited, well planned reforestations are being regularly carried out, maintaining the efficiency of centennial trees, in sharp contrast with what happens in the western slopes. The

Fig. 8.1 A chestnut orchard at harvest time

integrity of the area today is also supported by the presence of a cooperative of local entrepreneurs called 'Il Teccio,' whose mission is to maintain and promote the ancient techniques of gathering and growing chestnuts, as well as the land and the scenery, by obtaining the PGI classification "'Castagna essiccata nei tecci di Calizzano e Murialdo" for the exsiccated chestnuts of the "gabbiana" variety. The integrity of the historical landscape is also due to the fact that the rural buildings used to exsiccate chestnuts, built directly in the orchards, are in many cases still in good condition, though farmers no longer live there.

As for vulnerabilities, besides the above-mentioned abandoning of some of the orchards, the pasturing of sheep to rid the orchards of the undergrowth is no longer practiced. This not only diminishes the beauty of the orchards and makes chestnut gathering more difficult, but also increases the risks of parasites and diseases, besides favoring the development of other species. There have already been significant episodes of infestations by insects such as the *Dryocosmus kuriphilus*, in both high forest and coppice chestnut orchards. These trends are also helped by public policies in natural areas that are inadequate to the protection of historical chestnut cultivations. Even where the area falls into an environmentally protected zone there is nothing in the legislation that helps prevent the above phenomena. The many promotional activities, though supported by the activity of tourist farmhouses and the commercialization of chestnut based products, could benefit from increased public support, also through rural development plans, to prevent the decline of the traditional chestnut landscape which has already occurred in neighboring areas (Fig. 8.1).

8.3 Wooded Olive Groves of Lucinasco (43° 57′ 56″ N; 7° 58′ 04″ E)

The area is characterized by the traditional terraced olive orchard landscape and bears witness to a complex cultivation system which combined olive growing on private lands with common right pastures and town lands rented out as pastures. The area is located in the municipality of Lucinasco (IM), in the Maro valley, on the western slope of the basin of the Impero river. It extends for 285 ha, at altitudes ranging between 160 and 500 m a.s.l. The area is protected under landscape law n. 431/85. Lucinasco can be easily reached from Imperia by following state road SS 28 towards the north till Chiusavecchia (about 9.5 km), then turning left on provincial road SP 30, and following it for about 6 km until Lucinasco. SP 30 climbs up the hill and runs through the entire area of the olive orchards. The town of Lucinasco is located on a hill made of marly limestone, at about 500 m a.s.l., characterized by the presence of a close alternation of slated argillaceous scists and slates, of the Cretaceous-Oligocenous age.

The wooded olive orchard landscape is particularly significant not only for its historical persistence, but also for the particular arrangement of the orchards and for the work done on the slopes to cultivate them despite their steepness. The olives produced are of the 'taggiasca' variety. The name comes from the nearby locality of Taggia. Apparently, the variety was developed here by the Benedictine monks of S. Maria del Canneto during the Middle Ages. The agronomists of Liguria of the nineteenth century, where already familiar with the cultivation system known as 'oliveto a bosco' (wood-like olive orchards), characterized by large trees, often with irregular patterns, where terraces are used also for plants, and resources are accessed according to a system of traditional rights. Historian Giuseppe Maria Pira, around 1830, described the area as following: 'a town of six hundred people in the southernmost part of the Maro valley; it has a vast territory, with many olive trees, and also vineyards and cereal fields. It is rich in woods and pastures, especially in the area near mount Acquarone, from which the extremely useful waters spring that irrigate the countryside below.' Lucinasco, when olive cultivation reached its peak, was the main producer in the valley. Its capacity was 2,250 barrels a year and olive orchards extended over 773 ha. Historically, the relation between olive farming and shepherding has helped shaping the agricultural landscape with the combination—typical of the area of the Riviera di Ponente—of the *caselle*, constructions shaped as truncated cones in dry stone, used by shepherds and farmers, and terraced olive orchards. It was also helped by the fact that the Maro valley belonged to the counts of Ventimiglia and Lascaris di Tenda and was the main area for migrating sheep herds during the summer. The importance of the sale of forage to shepherds by the community is attested by the *Regolamento dei prati del comune di Lucinasco* (Regulations on the Meadows of the Town of Lucinasco), printed in 1899 by the typography Ghilini di Oneglia. The monoculture of olives was certainly stimulated by the high price of olive oil in the eighteenth century and by the opening of the French market, but was also favored by socio-cultural factors, including religious ones.

Fig. 8.2 The terraced olive orchards of Lucinasco

These led to the limitation of shepherd nomadism. Town lands were assigned to the cultivation of olives in the inner areas first and later also on the coast, in order to limit the lands used for transhumance in favor of tourist resorts and residential housing. The low income derived from the renting of municipal lands contributed to making olive growing, between the nineteenth and the twentieth century the 'cultivation that makes one poor,' according to a popular proverb common in the area between Nice and Savona around 1875. So much so that the already mentioned Giuseppe Maria

Pira, in 1830, had already proposed a return from monoculture to the ancient balance of 'a land with vineyards, fields and olive orchards'. Olives are nowadays used for the production of the PDO olive oil Riviera Ligure and also for direct consumption. The oil is famous for its delicate taste and the olives are prepared and commercialized in various forms. Locally, family businesses have specialized in the production of olives for direct consumption, using traditional local recipes.

The integrity of the rural landscape is guaranteed by the maintaining of the terraces, on which the local variety 'taggiasca' is still cultivated.

There are many family farms that maintain a close relation to the land, and the institution of the PDO label for the olive oil of Lucinasco has helped their activity. In fact, in recent years on the coast of Liguria many previously abandoned olive orchards have been recuperated using two different techniques: the more radical one entails a energetic pruning, the lowering of the foliage, which traditionally was rather high, and the use of irrigation (at least 300 l per plant per month). In many cases then old tree is cut at the base and then recovered selecting two or three shoots, a system which requires at least twelve years before the becomes again productive. In the area of Lucinasco, a less radical approach has been followed and in some cases we can still admire 'woods' of olive trees with high foliage, which are still productive. The landscape of Lucinasco is also protected and promoted by the presence of the Museum Lazzaro Acquarone, part of a network of museums in the province. Its ethnographical section shows the structure of a traditional cowshed and a real rural house inhabited by a shepherd until the beginning of the nineteenth century. In the open-air museum section instead one can see the traditional *caselle*, mentioned above, as also the traditional stone huts called *màccie.*

The vulnerability of the landscape is visible in the historical-archeological evidence of the abandoned lands and settlements. The Maro valley is characterized by repeated episodes of abandoned villages probably due to the end of the more successful phase of olive cultivation. Though in Lucinasco the decrease of olive orchard surface has been acceptable, what has gone completely lost is the practice of pasturing in the orchards, other than for a few occasional sheep, a feature which historically characterized the local landscape. Other elements of vulnerability are tied to the above mentioned use of non-traditional forms of cultivation which modify the shape of the foliage. (Fig. 8.2)

8.4 Terraced and Irrigated Chestnut Groves and Vegetable Gardens in Upper Valle Sturla (44° 26′ 12″ N; 9° 23′ 55″ E)

The selected area actually consists of a system of multiple areas located in the municipality of Borzonasca, in the province of Genoa, in a territory extending for about 2,400 ha. It extends from the southern slopes of Mount Aiona to the torrents Penna and Sturla to the south, at altitudes varying between 200 and 1,200 m a.s.l. The property is mainly private though irrigation follows a system of common rights once locally known as *comunaglie*. The area falls into the territory of the Regional Natural

Park of Aveto and is part of the network Natura 2000, with three sites of community interest. Borzonasca can be reached from toll-road A12, exiting at Lavagna, and following the provincial road SP 225 until Carasco, from which one takes the SP 586, reaching Borzonasca after 10 km. The chestnut groves can be reached from the branches of the SP 586 (dell'Aveto) that lead to Gazzolo, Caregli, Sopralacroce, Caroso, Perlezzi, Prato Sopra la Croce, Vallepiana and Castagneto. The geological substratum consists mainly of sandstone of the Formation 'dello Zatta,' a formation of light-gray micaceous sandstone with strata of siltstone, marls, argillite of the Late Paleocene–Cretaceous; the rest of the substratum consists of marly limestone alternated with argillaceous and sandy marls.

The significance of the terraced chestnut groves of the Alta Valle Sturla (upper Sturla valley) and of the sub-basin of the torrent Penna, is tied to the presence of a network of aqueducts used to irrigate the terraces, which create an absolutely unique scenery. The cultivation of chestnuts and of vegetables, typical of many Apennine areas, is here associated with the reshaping of the slopes and the adoption of a complex irrigation system. At higher altitudes, instead, the area is characterized by ample pastures. The scenery in general is extremely beautiful. The system of irrigated terraced cultivations still used in this area could be evidence of more extensive irrigated cultivations existing in the past and has its analogues in certain Alpine areas. The acqueducts of the sub-municipalities of Caroso, Caregli and Perlezzi are fed by the same torrent, the Calandrino. This has led to many controversies over the use and ownership of the lands in which the aqueducts originated. As a consequence, towards the end of the seventeenth century, there were a series of interventions by engineers of the Republic of Genoa, which left some very interesting cartographic documentation. The aqueducts of the Val Penna are used as a common good for private purposes. Access is regulated through a series of shifts, hourly in the past, and daily at present. The system is documented since the seventeenth century, and has been dated back in its present form at least to the sixteenth century, thanks to rural archeology studies on the settlements and on the terraced slopes. One of the peculiarities of this landscape is the relation that the irrigation network establishes between the lands subject to common rights (once *comunaglie* nowadays *beni frazionali*) in the upper part of the valley, where the aqueducts originate, and the irrigated terraces further down. In the common lands there are signs of the previous irrigated meadow-pasture system and associated sites of temporary agriculture, as documented in the second half of the eighteenth century. Further down towards the valley there are vast terraced areas present mainly close to settlements, at altitudes of about 800 m a.s.l.

The landscape of the chestnut groves and irrigated terraced vegetable gardens largely retains its integrity and only some areas have been abandoned. The irrigation network is still functioning in the vegetable gardens and chestnut groves on various terraces, often contiguous, near the settlements of Perlezzi, Caregli, Caroso, Valle Piana, Prato Sopralacroce. The historical irrigation system is in excellent condition in Perlezzi, where a series of stone conducts branch off from the main canal in an increasingly dense network, taking the water to each terrace and then to individual chestnut trees, through conducts dug in the ground. In the sub-municipalities of Perlezzi, Sopralacroce and Valle Piana, pastures are still managed collectively and

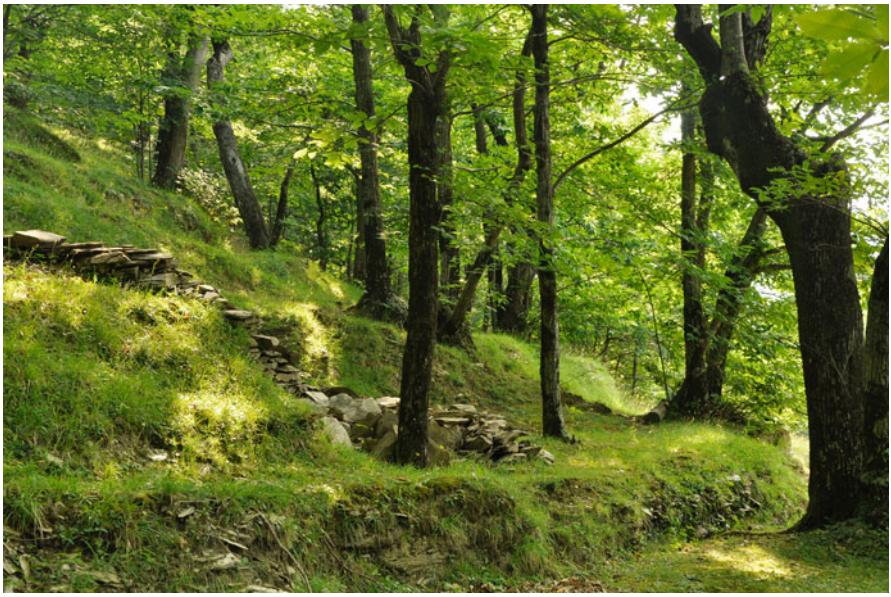

Fig. 8.3 The irrigated terraced chestnut orchards of Alta Valle Sturla are unique among the chestnut areas recorded in the Catalogue

aqueducts are used to irrigated vegetable gardens and chestnut groves. The terraces around Perlezzi, used for vegetable gardens, are delimited by rows of vines, of the variety *dolcetto nero* one of the few surviving examples of this type of arrangement in the area. The continued use of the irrigation system has ensured the survival of the original structures of the terraces and aqueducts, of which it is still possible to identify the various phases of development, associating them with the gradual development of the settlements. Another element of integrity lies in the management of the chestnut groves, thanks to the participation of some of the owners to the Cooperative Il Castagno (whose headquarters are in Montemoggio, Borzonasca), which promotes the commercial production of the chestnut of Borzonasca, while, thanks to two associations for the improvement of animal farming (Malga Perlezzi and Malga Zanoni) the mountain pastures have been maintained, preventing the spread of woods due to the abandoning of agriculture. In the areas above 800 m a.s.l., which consist of wide open spaces, sheep and cattle still graze freely.

The greatest vulnerabilities consist in depopulation and in the aging of the population, which leads to a gradual abandoning of cultivations, lack of maintenance of the terraces and a decrease in the number of farm animals. The abandoning of the chestnut groves leads to their transformation into mixed woods, losing their historical characteristics. In this context, the policies adopted in protected areas can be counterproductive when aimed soley at protecting vegetation and not these typical characteristics of the landscape. The maintenance of the terraces could also be supported through specific measures in the regional rural development plan. The

continuity of the collective management of common goods risks being undermined by the privatizing of aqueducts, to which the inhabitants of Perlezzi are absolutely opposed. Other threats to the landscape are indicated in the Territorial Coordination Plan of the Province of Genoa, and consist in the presence of infrastructures of great environmental impact for the artificial lake of Giacopiane, even though the water system in its eighteenth century form and under collective management has survived the environmental transformations caused by the construction of the artificial lake in the 1920s (Fig. 8.3).

8.5 Peri-urban Vegetable Gardens in the Valley of the Entella River (44° 18′ 56″ N; 9° 20′ 35″ E)

The vegetable garden area is subdivided into a number of smaller areas distributed in the valley of the Entella river, in the municipalities of Chiavari, Lavagna, Cogorno, Carasco and San Colombano Certenoli, in the province of Genoa. The areas are mostly private, extend for about 200 ha, at altitudes between 0 and 50 m a.s.l. The part alongside the river corresponds to the Site of Community Interest 'Foce e medio corso del fiume Entella' and is part of the network Natura 2000. It also partly belongs to an 'Oasi Faunistica' (animal reserve), included in the system of protected areas of the province of Genoa. The part that has most retained its integrity lies on the left bank of the river, in the municipality of Lavagna, and can be easily accessed from toll-road A12, exiting at Lavagna and continuing towards Lavagna until the church of N.S. Madonna del Ponte, then taking the foot path along the river Entella till the mouth of the river. The other areas are located along the provincial road SP 225 that goes through the valley of the Entella. The area is one of the most extensive alluvial plains of all Liguria. It is the result of the deposits of the river Entella whose water come from a basin of about 370 km^2, and by coastal marine deposits, and for a small part towards the west by the deposits of the torrent Rupinaro.

The significance of the area is tied to the persistence of these historical cultivations near the settlements, which are still characterized by a variety of crops and typical products, though they are now only fragments of the original landscape. Horticulture retained its integrity until the early twentieth century, when vegetable gardens occupied the territory to the east of Chiavari all the way to the district Gli Scogli, notwithstanding the major changes that occurred in the plain from the seventeenth century to the end of the nineteenth century, when the stone bank was built and the last stretches of marshland reclaimed. The entire part between Capo di Borgo and the sea, the part above the historical center that goes between the hill Ri and the river, on the right bank in the area of Caperana, all the way to Marasco, once constituted a single continuous landscape with the lower valley of the torrent Lavagna. For Lavagna, the vegetable gardens extended on the left bank of the river until Cavi di Lavagna and to the area above Rezza, of Moggia and continued till San Salvatore dei Fieschi, to the junction with the Graveglia torrent. The plain of the Entella is still characterized by a mixed agriculture in which, alongside viticulture, there are vegetable gardens

Fig. 8.4 Vegetable gardens are a historical feature of the landscape of many Italian urban areas

with varieties that are unique to the area and labelled PDO, such as Genoan basil, or recognized as Traditional Food Products by the Ministry of Agricultural Alimentary and Forest Policies, such as the Lavagnino Broccoli, the Radice di Chiavari, or the Lavagna Pea. Others, like the Gaggetta cauliflower, do not have an official label, but are nevertheless highly typical of the area. Until the mid-twentieth century, horticulture still used a complex irrigation system that included the so-called *bei*, i.e. canals, regulated by special statutes, cantilever wells, wells powered by wind, and norias powered by water.

The area retains its integrity especially in the area of Lavagna, in which the vegetable gardens, almost all of them cultivated in combination with rows of vine, have been saved from urbanization, so that in a few areas horticulture is still practiced by family businesses. In certain cases, local productions have been replaced by intensive cultivations in hothouses or fields, especially flowers and basil, which began to be cultivated in hothouses in the vegetable gardens of Chiavari since the 1920s, so as to create a market that would last the whole year round. The majority of the production of the vegetable gardens is still sold directly in the holdings: a micro-market that is perfectly integrated in the economy of the few surviving families of farmers who still grow vegetables and live on the land. Some of these farms still offer material for sowing and grafting for horticulture in the area of Chiavari.

The landscape associated with the vegetable gardens is highly vulnerable, suffering from the expansion of urban areas and infrastructures, such as the toll-road exit Lavagna and the areas reserved for artisans and industries. In fact, on the side of the river towards Chiavari, there has been a strong expansion of housing after WWII, and

horticulture as a result is highly fragmented and limited to small areas in between buildings. The old age of the majority of farmers that continue to practice horticulture independently of its actual profitability could also be a problem for the maintenance of the landscape and the preservations of local varieties. Hydrogeological regulations have helped save the vegetable gardens from urban expansion, but could nowadays turn into a threat if the authorities where to implement the Basin Plan, which calls for the raising of the embankment built towards the end of the eighteenth century and rebuilt in the Napoleonic period, which goes through the cultivated fields from Ponte della Maddalena to the mouth of the Entella, cutting through the part of the area that has most retained its integrity. The planned construction of a highway from the toll-road exit of Lavagna to the town of Carasco would also entail a drastic reduction of the surviving fragments of vegetable gardens on both banks of the river above the bridge Ponte della Maddalena (Fig. 8.4).

8.6 Wooded Meadows and Pastures in the Santo Stefano Cheese Area (44° 31′ 59″ N; 9° 28′ 13″ E)

The selected area consists of pastures extending for about 1,000 ha, in the Liguria-Emilia Romagna stretch of the Apennine at altitudes ranging between 850 and 1,500 m a.s.l. The area is partly private and partly public and collective. It belongs to the municipality of Santo Stefano d'Aveto (GE), and specifically to the sub-municipalities of Alpicella, Gavadi, Villaneri, Casoni di Amborzasco and Costapelata. The SCI (Site of Community Interest) Aveto is located within the area and the area is protected under landscape law n. 1497/39 and n. 431/85. The town of Santo Stefano can be reached from toll-road A12 exiting at Lavagna and following provincial road SP 225 until Carasco, then taking SP 586 and following it for about 45 km till S. Stefano. The area is visible from SP 654, which goes from Santo Stefano to the border with the Emilia Romagna region, looking south. Geologically the area is varied. It is partly made of morainic sandbanks and by the Argille a Palombini formation, consisting of gray and black clays and silty argillites with strata of marly and silicious limestone. The more peripheral part of the area has a substratum of limestone and sandstone or of limestone and marl.

The significance of the area lies in the presence of a landscape deriving from the historical agro-silvo-pastoral systems located near the forest of Mount Penna. The pastures are now again available for their original use thanks to the administration of the Regional Park Aveto, with which the area borders. Besides its historical persistence, the landscape is characterized by a great variety of environments, with sheer basaltic cliffs, wet areas and ample pastures both bare and wooded, which constitute the greatest reserves of biodiversity of the Apennines. The area has been state property since the Napoleonic period. In the early twentieth century, it passed to the state body *Azienda di Stato Foreste Demaniali* (the national agency for the state owned forests). There are many ex-feudal woods still subject to common rights and common lands (the so-called *comunaglie di parentela*), where you can find pastures still used for the production of local cheese known in the nineteenth century as 'Chiavari

Fig. 8.5 Ancient pasture meadows on the slopes of Mount Tomarlo still upkept for domestic dairy production

cheese' or 'Santo Stefano cheese,' and nowadays listed as Traditional Food Product by the Ministry of Agricultural Alimentary and Forest Polices. This product is different from the "San Sté" cheese, which began to be produced in the 1990s in the modern dairy of Rezzoaglio. Family businesses in the various settlements of the Gràmizza valley have maintained the production techniques and the particular flavor, and continue to manage the forage areas as in the nineteenth century, in which the collective management of the pastures coincided with the needs of the families. The managing 'Commissions' instituted by the 1927 law on common rights, still active, have inherited these functions and are themselves the basis of an important heritage associated with the pastures and with mountain grazing practices. At least since the seventeenth century, the stone buildings used for mountain pastures (locally known as *cassùn*) have been used during the mountain stays of the *utilisti* (users) of the various *ville* (holdings). Also tied to the local development of sedentary cattle farming are the barnyards with removable roofs (*barchi*) and the stone buildings (*canevìn*) for seasoning cheese. The rural hamlets of Casoni di Amborzasco, Casoni di Gavadi and Villaneri, the highest permanently inhabited settlements in the province of Genoa also derive from late medieval seasonal settlements. The forest of mount Penna—though private since 1799—was a route for the transhumance of sheep (summer pastures), goats and cattle, coming from both the Riviera Ligure on the coast (winter coastal

pastures) and from the Padana plain, already organized by local gentry (*fida*). Summer pastures are subject to the temporary agrarian rights given to the inhabitants. In fact these transhumance systems between the sixteenth and nineteenth century reactivated the rights on which the animal farming activities of the medieval monks of Bobbio and S. Giulia di Brescia were based. This determined the development of an ample area of pastures, which, towards the end of the nineteenth century, was still known as *'Alpi infernose'* (infernal Alps).

The landscape still presents a notable integrity though many parts have been subject to forestation processes due to the abandoning of agriculture. In the Gràmizza valley and on the surrounding slopes that are still plains with traces of ancient pastures with isolated beech trees, as in the Prato di Curio, which existed in this form at least since the seventeenth century, or Turkish oaks as in the case of Bandito di Amborzasco, both sites of historical practices such as the planting of shrubs to protect the fields from grazing (*ronco*), the cultivation of grey alders (*alnocoltura*), wolf traps (*fosse*), shepherds huts in beech woods used as pasture, and terraced meadows for forage (*lupinelle*). The *cassùn*, located at the higher altitudes and historically used to produce cheese, are still in part used in cattle farming.

The vulnerability of landscape of the meadows-pastures and wooded pastures in due to the abandoning of the annual cycle of agro-silvo-pastoral practices, that is the succession of mowing, pasturing, winter cleaning and used of controlled fires which, in these areas was still adopted in the 1970s and 1980s. The abandoning has altered the ecological relation between grass and trees, causing a vast process of forestation and the gradual loss of the historical biodiversity of grassland, including species protected by regional legislation, as well as erosion due to the instability of the woods newly grown on the ancient pastures. The crisis of dairy production began towards the end of the 1990s, following changes in EU food safety regulations and the tendency was amplified by the lack of turn-over with the younger generations. A policy aimed at promoting dairy products seems essential to the preservation of this rural landscape. Another vulnerability factor is the high risk of further privatization of the land and the erosion of common rights, which should instead be extended, at least as an experiment in pasture management. Various among these sites have been cataloged and listed for their exemplary value in several EU projects on European cultural landscapes (Our Common European Cultural Landscape Heritage) and also documented in the video *Fields of Demeter* (Bergen 2007) (Fig. 8.5).

8.7 Terraced Hazelnut Groves of Tigullio (44° 22′ 48″ N; 9° 23′ 03″ E)

The terraced hazelnut groves are located in various non contiguous sub-areas, extending for a total of 300 ha of private land in the municipalities of Mezzanego, Borzonasca, Ne, San Colombano Certenoli and Leivi, in the province of Genoa, at altitudes varying between 100 and 400 m a.s.l. Part of the hazelnut groves are protected under landscape laws n. 1497/39 and n. 431/85. The areas can be easily reached by taking the mains roads like provincial road SP 225 Fontanabuona towards

Fig. 8.6 Small terraces covered with grass are a traditional and inexpensive technique to manage mountain slopes

the town of S. Colombano Certenoli, SP 586 of val d'Aveto in the municipality of Mezzanego, in the localities Vignolo, Val Carnella, Prati di Mezzanego and SP 26 in the Graveglia valley. The hazel groves are located on the slopes of the merging basins of the torrents Lavagna, Sturla and Graveglia, independently of their exposure, on substrata consisting mainly of gray or blackish shale clay, varyingly silty, of the Late Cretaceous period.

The terraced hazelnut groves are a highly significant cultivation, a sign of the persistence of a very ancient practice. The terraces are of various age and structure, sometimes constructed on very steep slopes, and have shaped the landscape of many of the slopes of Tigullio. The hazelnut landscape has gone through various expansion phases starting from the fifteenth century, though palynologic and archeobotanic evidence in wet land sediments attest to probable cultivation phases in this area even in proto-historical periods. It is to the fifteenth century that the first notary acts mentioning hazelnut groves are dated. Hazelnut continued to be cultivated till the 1970s when, in a moment of maximum production, a series of factors caused a major crisis and the partial abandoning of groves. In the documents of sixteenth-century Genoan tax administrators (known as '*Caratate*'), hazelnuts are listed as present in more than 30 % of registered holdings, either as specialized monoculture or in combination with vine, chestnuts, olives, figs and other arboreal cultivations. Until 1850, as attested by the *Bollettini della Società Economica di Chiavari*, hazelnut farming was targeted at the local market, mostly for the preparation of

the so-called *reste*, typical necklaces sold at fairs or patron saint celebrations, and only a small part was shipped overseas, to England and North and South America. The development of the confectionery industry towards the end of the nineteenth century, and especially the production of chocolate bars, gave local entrepreneurs the chance to create stable commercial relations with industries in Piedmont and Switzerland, giving new impulse to hazelnut cultivation. Towards the end of the nineteenth century the production was more than 100 tons, of which 80 produced in the sole municipality of Mezzanego. It gradually rose until, in 1960, it passed 600 tons, with more than 600 ha of hazelnut groves in the province of Genoa. Nowadays active cultivations are reduced to 300 ha, of which 200 are in Mezzanego and 100 in San Colombano Certenoli. However, the listing of the varieties of Tigullio hazelnut as Traditional Food Product by the Ministry of Agricultural Alimentary and Forest Policies, has determined a slight increase in production. At Prati di Mezzanego, there is a building once used for the preparation of hazel-nuts, the 'ex-hazelnut factory,' of great historical and scenic importance. The landscape of the terraced hazelnut groves of Mezzanego and San Colombano has been listed as a site of historical interest in a project carried out in collaboration with the French Ministry of Environment and Sustainable Development (Les Paysages des Arbre Hors Forê t Project—PAHF).

Though the groves are fragmented into small non-contiguous areas and their extension has decreased, the hazelnut landscape has largely retained its integrity. This integrity is the result of the fact that the production of hazelnuts has always continued. In fact there has recently been a small increase in production, after the creation of the PGI "Misto Chiavari," which specifies a traditional mixture of hazelnuts: 55 % Dall'Orto, 17 % Del Rosso, 16 % Tapparona and 12 % other varieties, such as Bianchetta, Longhera, Sarveghetta, and others. As part of this project, other actions have been performed, such as the creation of an agreement with the pastry shops of the main cities of the coast for the direct transformation of the hazelnuts. The Territorial Coordination Plan of the province of Genoa identifies as significant agricultural areas the hazelnut groves in the municipalities of Mezzanego and San Colombano Certenoli.

Notwithstanding these interventions and the official acknowledgment of the historical importance of hazelnut cultivation, the vulnerability of the landscape remains high, making it impossible to exclude the possibility of its disappearance if certain conditions are not maintained. Many hazelnut groves are nowadays abandoned, and others have been recently transformed into olive orchards. Other risks are associated with the advanced age of farmers and the high cost of manual production, and the lack of a consolidated local market (Fig. 8.6).

8.8 Low-growing Terraced Vineyards of Tramonti (44° 04′ 34″ N; 9° 47′ 16″ E)

The area is characterized by low-growing vineyards on terraces, extending over about 100 ha within the territories of three adjacent places along the La Spezia littoral: Tramonti di Biassa, Tramonti di Campiglia and Albana, all three in the province of La Spezia. The area is included in the Cinque Terre National Natural Park, the

Porto Venere Regional Natural Park, and the Porto Venere-Riomaggiore SCI. For its traditional landscape modeled by still ongoing wine-growing on terraces, the area has been included—along with Cinque Terre, of which it is the natural extension—in UNESCO's World Heritage list. It consists of a coastal strip that slopes down steeply to the sea from a ridgeline with an elevation ranging between 350 and 600 m a.s.l. The morphological complexity of this mountain range running longitudinally along the coast, whose versants decline more steeply closer to the sea, is due to the diverse lithological nature of its substratum. Schist-clay and marl clay formations are more easily eroded, resulting in gentler slopes, rich in detritic deposits, whereas ophiolitic and calcareous formations are more resistant and hence form steeper slopes.

The area owes its significance to the combination of the aesthetic qualities of a landscape with precipitous slopes descending to the sea and the historical persistence of low-growing vineyards. It is this combination that led to the choice of this area for inclusion in the present catalogue instead of other better known ones with remarkable landscapes in the Cinque Terre district. Here viticulture, attested as early as the twelfth century in documents in the Tino monastery, has the same features as in Cinque Terre, but even more accentuated: fragmented and parceled private property; farming on artificial terraces retained by dry-stone walls and connected by steps and narrow paths; a clear-cut prevalence of grapevine, low-growing (the earliest system), on pergolas, or in rows (the more modern system, which is gradually replacing the other two); and olive-growing for self-consumption. Family businesses integrated these cultivations with others on the wider terraces on the inland versant of the La Spezia Gulf, which included vegetable gardens, orchards, and a modest subsistence grain production that lasted until immediately after World War II. In the Campiglia area, livestock farming is documented ever since the 1950s or 1960s. Besides the usual barn animals and a few milk cows in the Albana valley, the livestock mainly consists of sheep and a few goats. This combination of sheep farming and specialized viticulture goes back to the practice of opening the terrace vineyards to transhumant grazing flocks after the harvest. These coastal winter pastures remained in use until the end of the nineteenth century. The local settlement system is centered on the burgs of Biassa and Campiglia. The houses stand among the terraced vineyards that used to cover the whole area, forming the small wine-growing hamlets of Fossola, Monasteroli, Schiara, Navone, Persico and Madonnetta. There are also many self-standing *casotti* scattered among the terraces. In the Valle di Albana, the monks of the Tino monastery managed their holding from a large farmhouse. Local society lived in a close relationship with the environment. The main agricultural activities included the clearing of land from rocks; the use of these rocks to build dry-stone walls; the transporting of soil in baskets; the collecting of ground and rainwater in underground cisterns built of stone and cement; and the building of *casotti* leaning against the terraces. The *casotti* housed the cellar, and farmers resided there at harvest time. The production is oriented towards high quality wines, as "Cinque Terre" DOC (Controlled Origin Denomination), and "Sciachetrà" DOC (also called *rinforzato*), which is also added by Slow Food in the "Ark of Taste" list.

Although part of the land has been abandoned—as a consequence both of migration to the cities and of the aging of the remaining farmers—the traditional "Tramonti

Fig. 8.7 The growing of low vineyards on terraces is one of the traditional techniques developed in the Cinque Terre

system" continues to function today, although on a smaller scale. A number of *Campigliesi* and *Biassèi* still farms the *piane*, on a full or part-time basis, with the assistance of some modern innovations such as a small rack railway to transport grapes and tools. Especially near the sea, the traditional model still maintains its integrity: *piane* (terraces) with low-growing grapevine, low walls restored in the old style, and *casotti* still used to service viticulture. Over all, the paths still follow the old routes and are maintained by the periodic passage of farmers. In recent years, agriculture has resumed on some abandoned land thanks to the introduction of saffron farming—already mentioned in thirteenth-century documents in the Tino monastery—by a local non-profit association (Associazione Campiglia). The same association has also begun a project to replant vineyards over 5 ha to produce the celebrated *rinforzato* wine (once known as *amabile*) on seaside terraces at Persico and Navone, the areas where this cultivation has the strongest tradition.

The oldest vulnerability of the area is its landslide proneness. Landslides have been increasing after the last war as a consequence of the decline of farming and

the collapsing of retaining walls. Another threat is the expansion of woods onto abandoned terraces. The Park norms and forestry laws do not allow restoration of these terraces to their previous use unless compensational reforesting is carried out elsewhere; something there is little need for, considering that the area is already densely wooded. Other and more recent problems are the same that led to the crisis of the traditional land organization of Cinque Terre after it had survived emigration from the 1950s onward. In our area these problems have not been as severe so far, but they still constitute a looming threat. *Casotti* are being purchased by non-farmers who are turning them into holiday homes. In this area the Park Plan only requires the cultivation of 300 m^2 per house, whereas for the rest of the park the minimum is 1,000. Another risk lies in repeated attempts by housing developers to obtain modifications to land plans overriding Park rules in their favor. The same kind of logic is behind a plan for a road in the Cinque Terre Park connecting Campiglia to a funicular to be built in the territory of Riomaggiore. This projects threatens to open the way to mass tourism and, consequently, throw the whole local rural system out of balance (Fig. 8.7).

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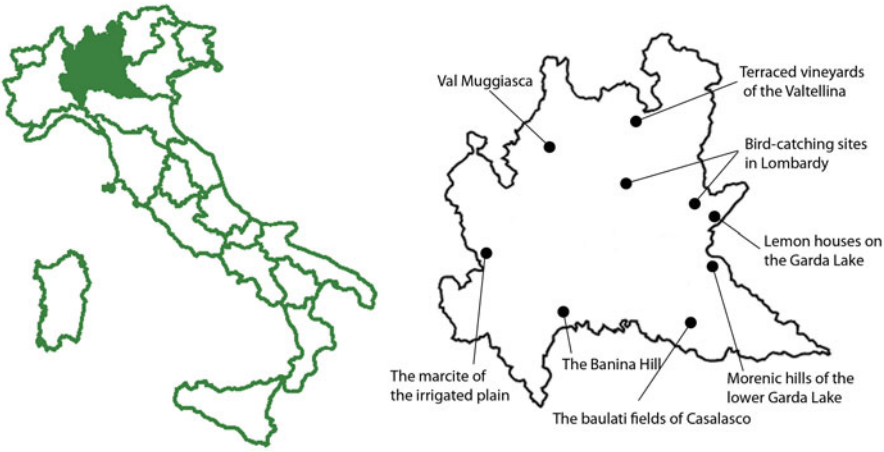
Chapter 9
Lombardy

Lionella Scazzosi



9.1 Introduction

Lombardy's rural landscape is highly diversified, including mountain areas with peaks of over 2,500 m high, hills and plains. The area is crossed by an extensive network of river waterways and it has great lakes as well as Alpine and pre-Alpine small and medium lakes. The forest surface covers 28 % of the region, while the agriculture surface covers 46.85 % and grazing lands 11.5 %. The rest of it hosts one of Italy's most industrialized territory with both urban and rural areas; it also includes a large surface referred to as the "urban pole" in the national strategic plan for rural development (2007–2013), which is characterized by a diffused urbanization made of small and medium settlements within the rural area. Lombardy presents different climatic and geomorphologic conditions as well as different types of vegetation. Since

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Ancient Times and over the centuries, human productive interventions have been carried out everywhere in the region—except in some of the highest mountainous areas—and indeed deep changes have been acted by socioeconomic and productive associations and/or by administrative and political bodies that local population had set up. Inventorying and cataloguing as they have been carried out in this research actually provide a cognitive background to any initiative for the protection of areas of outstanding interest, and allow guiding changes in order to keep a link with the historic traces of the past that are left on the whole territory. This should help reach a diffused quality of places in line with the most recent orientations of such concept and with the European policies on landscape (European Landscape Convention 2000).

In Lombardy, the development of agricultural industrialization and urban enlargement have partially reduced the extension of rural landscape that hosted complex historical traces of the past. Sites—some of which are rather small—were chosen in this research with the intent to show the richness and complexity (*integrity*) of the traces of the past that are left on them, to offer an overview of different categories of agrarian landscapes, to underline their relevance as testimonies of characters that have disappeared (*rarity*) and their function of collective memory as acknowledged by the local population.

We used a two-level but integrated method for cataloguing that allowed addressing various disciplines and intervening at different scales on the territory; we actually introduced the concept of "*landscape systems*" where systems are made of *elements* (or *components*) interconnected by *historic links*.

By *landscape system*, we mean the physical expression—visible and tangible—of productive, social, economic and cultural entities within the community who has been acting over time (ex. communities living in the mountain areas, or monks living in the plains) or of an outstanding project conceived and carried out by a single person (ex. the Sforza family's works of irrigation in the Padan Plain) that are still readable today. Such concept refers to the cultural line expressed in the studies of regional history and human geography, carried out especially during the twentieth century and referred to the works of March Bloch and Fernand Braudel in France and of Emilio Sereni and Lucio Gambi in Italy. It is also linked to the definition of "evolving" cultural landscape used by Unesco and to scientific theories. It is based on historic and functional links that existed in the past and came to us and where ecological links are only one element of today's methods to interpret places. This reading process, which uses *historic systems*, focuses on the *links* between the elements and the context and among elements themselves: this approach was strongly missing in traditional census of historical heritage and landscape that preferred to identify large homogeneous territorial areas, formal patterns, use of soil, cultivation regulations. *Links* are physical, visual, functional, economical, productive, social, cultural and symbolic. The *elements* that make up the system and that interact reciprocally may be different according to the places. Among the items that we consider as *elements* there are: the network of fields, the constructive structures of agricultural areas (manufacts like terracings, embankments, *baulature* or hill-shaped fields, *marcite* or water meadows, channels, etc.), the buildings with their own architecture and function,

cultivation regulations, cultivation and breeding techniques, manufacts' building and maintenance techniques, land regulation, ways of life, etc.

The research in the Lombardy region has identified some specific *agrarian landscape systems* and some *constitutive elements* still visible today which belonged to other systems. Lombardy's *systems* that were pointed out are: the "mountain transhumance", including the special case of the Muggiasca area; the "hill settlements" of the Banina Hill and of the Moreniche Hills of the Garda Lake. All the essential elements that originated them are still visible and readable as well as the links that connected them into a socio-economic and cultural unity (*landscape system*). They also still contain many other kinds and levels of historic traces of the past, although we cannot deny that agrarian landscapes have undergone inevitable changes due to the action of man and nature over time.

Constitutive *elements* that were pointed out have various significant features: the *rarity* of unchanged historical treatment techniques of soils still used in contemporary agriculture (*baulati fields* in the Casalasco area that are still used; and *marcite,* which were vanguard techniques dating back to the Middle Ages that have characterized the irrigated plains until the nineteenth century, are still visible in some rare sites thanks to public financing, to specific cultural willingness and to the technical know-how that few farmers still preserve); the state of the *remains* (*uccellande* or bird traps, which are vegetal structures to catch birds, are very common in the forests of northern Italy but are now legally prohibited for hunting goals; the *limonaie* or lemon-houses, structures which are still visible today in a large part of the Garda Lake landscape, are unique in Italy and abroad, and if they were conceived for the production and exportation of citrus fruits in Europe, most of them are no longer used now); the role of *characterizing* places in the collective perception of landscape (*terracings* are diffused in the mountain and hill areas and most of them are still used as productive vineyards, like for example those in Valtellina).

The research was based on some cognitive sources. Actually it strongly referred to global regional data that were taken from the studies for the Regional Landscape Plan. In addition to them, more detailed information and assessments were considered, like those taken from bibliographic sources and from specific data directly given by the staff working in regional, local and protected areas bodies, as well as by operators and researchers with a specific local knowledge. Sites were chosen through a close collaboration with the offices for landscape of the Lombardy Region and after consultations with local bodies.

9.2 The *baulati* Fields of Casalasco (45° 06′ 50″ N; 10° 25′ 40″ E)

This rural landscape is characterized by the presence of the traditional *campi baulati* system. It extends for about 2,500 ha at an altitude of 25 m a.s.l. It occupies most of Casalasco, the south-eastern sector of the province of Cremona, located at the border with the province of Mantua and delimited by the Po river and the final stretch of the Oglio river. The more representative sections are located between the

municipalities of Piadena, Calvatone and Tornata, in the province of Cremona, and Rivarolo Mantovano in the province of Mantua, and can be accessed through state road SS 10 which connects Cremona and Mantua. The area is included in the SIC Le Bine and in the Regional Park Oglio Sud. The area extends over the alluvial terrace of the fundamental level of the plain. It is mainly gravel and sand, covered in many places by a superficial layer of mud and the terrain is flat. The soil is deep, with average density and good fertility, often mixed at low depths with calcareous outcrops know as "bambole" or "castracan."

The significance of the area is due to the historical persistence of the field management and irrigation system typical of the Casalasco area known as *baulatura.* The *balauti* fields are not continuous, but occupy small portions of the above area specifically tied to the use of this agricultural technique. Described in Virgil's *Eclogues*, the lands of Cremona were characterized already in the Roman period by a hierarchical irrigation system, associated with the centuriation, which guaranteed a widespread distribution of water to the fields. The cultivation of the fields according to the system of the *campi baulati* and ditches came after the reclaiming of the marshy land in the lower part of the area, although the origin of this irrigation system remains unclear. A sharecropping system was certainly in place already in the fifteenth century, as stated by abbot Giovanni Romani in the first volume of his *History of Casalmaggiore*, published in 1828. The *balautura* system has the purpose of rapidly draining rainwater from mostly argillaceous fields. Fields are shaped with a central hump and kept in this condition through a special plowing system. The draining of excess water is guaranteed by ditches that are still in good repair. Fields are traditionally quite large, mostly rectangular with an average size of 100–150 by 40–70 m. A thick network of parallel ditches, hierarchically organized in a very precise fashion according to size, ensures the draining of excess water, which would otherwise remain trapped in an area that is located lower than the maximum level of the two rivers. Only an expert system of embankments prevents it from being flooded. In this way, instead, water stagnates only in particularly rainy years. The scenery is distinctively marked by draining ditches, rows of trees or hedges, and was also characterized, up to the second half of the twentieth century, by the intense cultivation of vines, alternating with fields of cereals and other plants. Vine was cultivated according to the traditional system of the *piantata* of the Padania valley, i.e. in combination with trees used as living props, and was for a long time the most important source of revenue in the area.

Concerning integrity, few holdings, in which a few rows of trees or small family vineyards are all that is left to separate the areas now dedicated to the cultivation of cereals, tomatoes, or melons. In the second half of the twentieth century, the system based on the combination of vine and other crops progressively disappeared, and in recent years there have been yet more changes due to the expansion, still under way, of vegetable gardens and nurseries of ornamental plants.

The vulnerability of the *baulati* field landscape and of the traditional cultivation systems is due to their being progressively abandoned: The *balautura* required major and constant maintenance work, and with the spread of mechanization, the use of traditional farming systems and maintenance of water works have declined, though

Fig. 9.1 The *baulatura* system is one of the historical land management techniques of the Po River valley, developed to drain water away to reduce soil humidity

one must acknowledge that working and living conditions for farmers have improved. The transformation of the agricultural landscape following mechanization, and the progressive disappearance of these traditional systems from even the memory of the people, suggests the importance of making the history of the territory known as well as the reasons that motivated the adoption of these traditional systems, whose layout can, with difficulty, still be discerned in the gently curving shapes of the fields. The Province of Cremona, as part of the Agenda 21 program, has approved a specific project, aiming to attract the attention of the local population on these traditions which, while part of the everyday life of each inhabitant, are no longer attributed their deserved cultural and environmental value, and risk being no longer perceived in the layout of the land or worse completely forgotten. The Province is therefore seeking to interest tourists in the rediscovery of the local landscape as an expression of the shaping of the land by the inhabitants (Fig. 9.1).

9.3 The Banina Hill (45° 10′ 23″ N; 09° 29′ 15″ E)

The area corresponds to the agricultural system of the Banina hill and extends for about 1,450 ha in the municipalities of San Colombano al Lambro (MI), Graffignana (LO), Inverno, Monteleone and Miradolo Terme (PV). Most of it is public land. It occupies the upper part of the hill, at altitudes varying between 70 and 145 m

a.s.l. and is served by an efficient system of roads. It is included in the Parco della Collina of San Colombano PLIS (Local Park of Super Communal Interest). The hill extends lengthwise for about 8 km, from north-west to south-east, and has a maximum width of 2 km, on the north-east/ south-west axis. It is located between the Lambro River, which borders its north-eastern slopes and the River Po to the south. The area can be reached from Lodi going south on SS 235 state road, or from Pavia, going east on SS 234 state road. The area is protected according to the landscape law n. 1497/39.

The geographic and geologic uniqueness of the Colle di San Colombano area has always attracted the interest of both scientists and amateurs interested in geology, paleontology and archeology. The ancient Pliocene seabed continues to offer testimonies of its existence. In some parts of the hill it is sufficient to dig a little to plant vine to unearth beautiful specimens of excellently preserved fossil shells. The hill is made of Pliocene clays and limestones covered by alluvial material of the Quaternary period. The south/south-west contour shows an indentation that seems to correspond to an ancient bend of the river Po. The hill seems the remain of a once much more extensive plateau, eroded on two sides by the increased development of the two rivers that border it.

The significance of the area lies especially in the persistence of the original agricultural landscape characterized by a highly subdivided network of holdings, in which vineyards, meadows, and fruit orchards alternate. The area is already mentioned in Middle-Age sources. The importance of the area of San Colombano is attested by a series of privileges that the Visconti family gave the area at the end of the fourteenth century to help its development, cultivation and population. The land was subdivided among small and medium-sized owners of pieces of land spread out over the hill rather than concentrated in single properties. The fragmentation of the holdings is also a consequence of the habit of the monks of the Carthusian monastery of Pavia to grant the temporary or indefinite use of their territory of 1,300 ha, since the fifteenth century. The land of San Colombano was described by Francesco Petrarca who, after having been for a long time a guest of the Visconti family, at the Castle of San Colombano, wrote in 1353 in a letter to the Archbishop of Genoa: *"This a lovely and extremely fertile hill, positioned almost in the midst of Cisalpine Gaul, which in the part from which the wind Borea and Euro blow is close to St. Colombano, a very well-known castle surrounded by strong walls. At the foot of the hill flows the Lambro, a river with very clear waters which, although small, can be navigated by ordinary boats, which flowing from Monza not far away from here, goes into the Po: to the west the view is ample and spacious, a pleasant solitude and a friendly silence reign. I know of no other place that from such a low height can offer such a vast view of noble lands; it suffices to cast your gaze round to see first Pavia, Piacenza and Cremona. . . . Behind we have the Alps that separate us from France and which, with their snow-capped peaks surrounded by clouds seem to touch the sky. In front of my eyes is the Apennine and a countless number of lands and castles, among which that of Clastidio. . . . Finally at my feet I see the Po which with an ample bend winds its ways among the rich fields of the underlying plain."*

Fig. 9.2 The landscape of Collina Banina is characterized by polycultures with vineyards, fruit orchards and meadows

The integrity of the area is tied to the historical persistence of a highly subdivided network of holdings, although the characteristics of the cultivation have changed in time. Vine is the main cultivation, from which the DOC (Controlled Origin Denomination) label wine "San Colombano al Lambro" is produced, but vineyards continue to alternate with meadows and fruit orchards. The survival of the traditional landscape is partly due to the establishing of a PLIS (Local Park of Supercommunal Interest) called Parco della Collina di San Colombano by the provincial administrations of Milan, Pavia and Lodi. The Park Plan regulates the use of the territory of the hill and the urban and naturalistic interventions through both prescriptive norms and general guidelines. The type and the enacting procedures of the interventions stipulated by the Plan are not solely aimed at protecting the natural characteristics of the area but also at preserving established human activities, carried out in traditional forms.

Vulnerabilities are in part tied to the transformation of cultivations and in part to the fragmentation of the property. The small size of the holdings has often been a problem for their maintenance. For this reason, many properties have been allowed to grow wild, thus causing the loss of the agricultural characteristics that are the distinguishing sign of the local identity, in favor of the increase of woods which are gradually colonizing the abandoned areas (Fig. 9.2).

9.4 Morenic Hills of the Lower Garda Lake (45° 23′ 10″ N; 10° 39′ 55″ E)

The area in question corresponds to the hills of the lower Garda river located in the territories of the municipalities of Ponti sul Mincio, Monzambano, Cavriana and Solferino, in the province of Mantua. It can be accessed through provincial road SP 19, which connects Mantua to Peschiera del Garda. It extends for about 4,000 ha and consists in a series of gentle hills with an average altitude of 120 m a.s.l, between the southern shore of Lake Garda and the plain of Mantua, and is bordered by the Mincio river to the east and the Chiese to the west. The eastern part of the area is part of the Regional Park of the Mincio River, instituted by regional law n. 47, of September 8, 1984, later integrated by regional law 35/87, and is protected under the landscape law 1497/39. The morainic hills are currently shaped as two wide concentric semi-circles with their open end towards the plain, and date to the period of the two last glaciations. The geological substratum is made of morainic gravel, sometimes cemented, with strata of argillaceous alteration and presence of calcareous cobbles. The glacial deposits of the Garda river, shaped by the passing of time and by the action of the water, are endowed with a varied and abundant flora of great naturalistic importance.

The significance of the local landscape lies in the combination of the special environmental characteristics tied to the mild climate typical of the ancient Insubria region, combined with the historical persistence of agricultural activities and the beauty of the Garda scenery. Populated since the pre roman times, the area is characterized by a series of risings and small hills and is endowed with a particularly valuable environment thanks to the microclimate created by the Garda basin, which mitigates winters, making possible the widespread presence of vineyards and olive orchards, besides the woods, thus contributing to the original characteristics of the landscape. Hills alternate with barren fields and spring water ponds. Along with the natural vegetation, which includes willows, alders, downy oaks and European hop hornbeams, a typical feature of the cultural landscape is the presence of cypresses, introduced a long time ago, and commonly used to mark the ridge of hills, driveways and the bank road of the Virgilio canal. This canal, built in the 1920s, brings irrigation water from the dam of Ponti sul Mincio to the hilly area on the right bank of the Mincio. By exploiting the difference in altitude it also powers a small hydroelectric plant. On the southern slopes, we usually find terraced vineyards, which produce the DOC (Controlled Origin Denomination) label wine “Colli Morenici del Garda”; in fact, the climate is ideal for vine, which is widely present. The low water requirements of vine has favored its presence in the morainic hills up to the advent of irrigation, when it has often been replaced by forage.

The integrity of the landscape depends on the preservation of agriculture. Vineyards are the most widespread and interesting element, especially when terraced. As one can expect, given the extension of the area, there are parts in which both the expansion of urban areas and changes in agriculture have reduced the overall integrity of the landscape. Vineyards have been replaced by other cultivations and meadows

Fig. 9.3 The Low Garda Hills landscape is made of dry and irrigated meadows mixed with vineyards

have begun to be irrigated, modifying the aspect of the hilly areas, especially during the dry season. For this reason, alongside portions of great historical interest the rural landscape has also areas that have changed significantly.

The vulnerability of the area is tied to the tendency towards urbanization, which tends to create a marked continuity of buildings, and to intensification and further changes in agriculture. Agriculture currently occupies rural spaces which are being continuously eroded by urban expansion. Furthermore, the transformation of many farmhouses into secondary residences is altering one of the most significant aspects of agricultural landscape. The Coordinating Territorial Plan of the Province of Mantua calls for the preservation and extension of the intensive cultivation of vine in the morainic area. This is a clear signal of the Administration's intention to preserve the special qualities of the rural landscape, even if not in accord with the characteristics of historical landscape. Even the 2008–2011 Provincial Agricultural Plan establishes measures aimed at "merging holdings and preserving the unity of agricultural areas, to prevent the excessive fragmentation of the land. . . ." The same Provincial Agricultural Plan proposes "contracts of territorial protection" to be offered by one or more Communes, to integrate the income of farms who provide certain services. This could have a positive effect on the maintenance of the land, including smaller roads connecting holdings, localities and municipalities and bicycle routes, but also green areas, river banks, irrigation channels (Fig. 9.3).

9.5 Lemon Houses on the Garda Lake (45° 41′ 00″ N; 10° 39′ 00″ E)

The lemon houses area extends over a 300-meter-deep strip along the banks of Lake Garda, between Salò and Limone, in the municipalities of Salò, Gardone Riviera, Toscolano Maderno, Gargnano, Tignale, Tremosine, and Limone, all in the province of Brescia. The lemon houses are mostly in Maderno, Gargnano and Limone, on land mainly privately, for a small portion publicly owned. Since the houses lie along in the coastal strip of the lake, they are mostly accessible directly from SS 45/bis (Gardesana Occidentale) and secondary roads branching off from it. The banks of the Brescia side of the Garda Lake are made up of ceroid white limestone, oolithic limestone, gray limestone, and compact dolomitic stone, with frequent groundwater detritus and Wurmian morainic deposits. Gray clayish schist occurs locally. In the south part of the area are weakly cemented gravelly moraines with a clayish alteration stratum with maximum depths ranging from 1 to 2 m.

The area owes its significance to the historical persistence of the most characteristic cultivation of Lake Garda—introduced as early as the thirteenth century, possibly by the friars of the convent of San Francesco di Gargnano—and the aesthetic qualities of the Garda landscape. The citrus-groves landscape, like that of the Insubria region, has its origin in specific dynamics, the result of the interaction of environmental aspects and human action. It is characterized by a typically Mediterranean vegetation, rather untypical for the area's traditional Alpine and pre-Alpine environment, a result of the immigration of thermophilic southeastern plants in the postglacial period. The later cooling of the climate is believed to have led to the shrinking of this vegetation to the lake area, whose microclimate has allowed it to survive until today. To make citrus growing possible at this latitude (the northernmost in the world for citrus), as early as the sixteenth century imposing structures called *limonaie* were built, consisting of large rectangular hothouses on long terraces. *Limonaie* have high perimeter stone walls on three sides, and pillars up to 10 m tall connected by a framework of chestnut-wood beams. Each pillar is joined to the two adjacent pillars on the same row by three parallel maple beams, to which movable shutters were attached to close off the open side of the *limonaia*. From November to March, to protect the orchard from the cold the *limonaie* were closed with large wooden movable partitions with glass windows, and covered with wooden-plank roofs. These structures were thus true greenhouses. The trees, being planted into deep soil and supported by a chestnut-wood frame, attained the maximum of their growth. The irrigation network consisted of runnels, usually built of limestone, that conveyed water from a cistern, a well or a stream. On especially cold nights, or when it snowed, the gardeners would light olivewood fires inside the hothouse, keeping them warm enough to keep the trees alive. The whole surrounding land was planned around the *limonaie*: cypress trees were planted to serve as windbreakers, to protect the orchards from rocks tumbling down the steep slopes of the above-lying mountains, and to provide shade to the water cisterns; the farmers looked for natural springs, or used the water of the lake; paths were built to allow access to all the *limonaie*; and commercial infrastructures

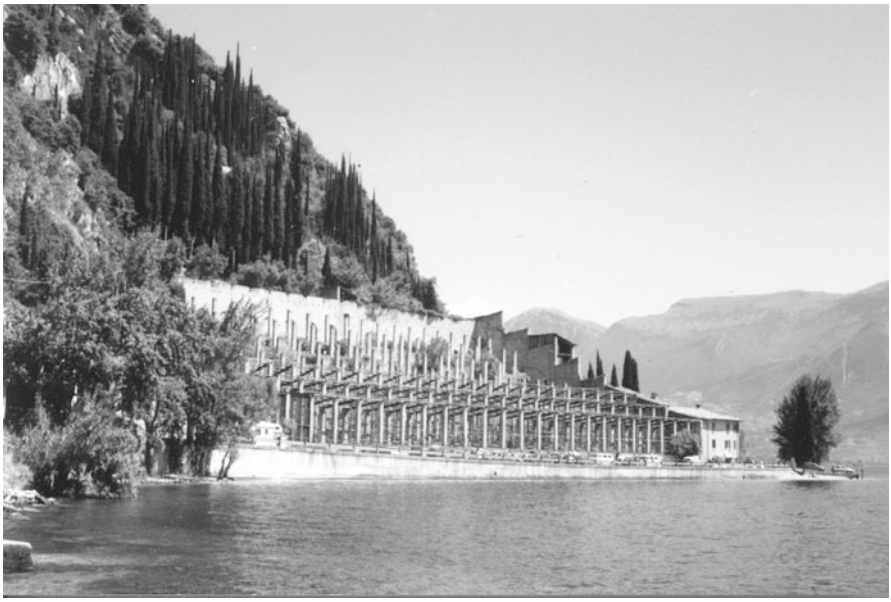

Fig. 9.4 The lemon houses, existing since the thirteenth century, are one of the most significant components of the Garda landscape

were set up. The *limonaie* area are part of a larger area placed under planning restrictions for its landscape value as early as the 1950s, in application of the landscape law n. 1497 of 1939, and are included in the Alto Garda Bresciano Regional Park, established in 1989.

As regards integrity, most of the citrus-growing areas have been converted to other agricultural uses or to private gardens, and in some cases are greatly deteriorated or changed. Only ten or so *limonaie* are still active and productive, thanks to the commitment of enthusiasts who operate them as a hobby or tourist attraction. The historical agrarian landscape, however, in spite of recent urban growth and land transformation, is still partially preserved. Many *limonaie*, in various states of conservation, can still be seen in the area. In recent years some publicly owned *limonaie* in the communes of Tignale and Limone have been restored and made into museums, testimonies of the historical cultivation the area was famous for.

The vulnerability of the *limonaie* landscape depends on the loss of the profitability of this cultivation system. Ever since local farmers gave up lemon growing, the *limonaie* have lost the economic function they had been created for. However, they have retained their importance as a landscape feature that makes this stretch of the banks of the Garda absolutely unique. It is hence urgent to formulate policies to protect, preserve, and develop this historically complex landscape by finding compatible uses and defining management criteria (Fig. 9.4).

9.6 The *marcite* of the Irrigated Plain (Ticino Area: 45° 17′ 00″ N; 08° 53′ 00″ E—South Milan Area: 45° 21′ 43″ N; 9° 05′ 08″ E)

The *marcite* landscape has a total extension of about 560 ha, comprising scattered areas in the irrigated plain between the Ticino and Adda rivers, in the provinces of Pavia (municipalities of Bernate Ticino, Morimondo and Vigevano) and Milan (municipalities of Albairate, Buccinasco, Calvignasco, Lacchiarella, Melzo, Noviglio, Peschiera Borromeo, Settala, and Zibido San Giacomo, as well as others). These areas are flatlands, with average altitudes around 100 m a.s.l. Some of them lie within the Ticino Valley Regional Park, the South Milan Agricultural Park, the Basso Corso e Sponde del Ticino SCI and SPZ, and the Oasi di Lacchiarella SCI. All the *marcite* lie onto a substratum of alluvial origin composed of sand and gravelly sand, with a brownish alteration stratum between 40 and 60 cm deep, forming the so called *diluvium recente.*

The *marcite* are a very old type of permanently irrigated meadows owing their significance to their characteristic hydraulic-agrarian structure and their ecological role. They are large, slightly inclined rectangular plots. In their higher parts, water runs in small channels called *maestri* or *adacquatori*, from which it overflows, inundating the meadow and forming a thin tepid sheet over the grass cover. In the lower part of the meadow, drainage channels collect the excess. This cultivation method was introduced in the early Middle Ages, when Cistercian monks from the abbey of Chiaravalle, Umiliati monks from Vidoboldone, Morimondo and Bernate, and the Milanese Sforza family built a dense network of large and small artificial canals to reclaim the plain, place new land under cultivation, and control water distribution the year round. These works are partially aligned with the earlier ancient Roman centuriation of the area. The constant flow of water from underground springs called *risorgive* or irrigation canals, and its almost constant temperature prevent frost, even in the coldest months. Thus, grass grows lushly, allowing mowing up to 10–12 times a year, even under adverse climatic conditions. The *marcite* were known as the "green gold of Lombardy", because until the postwar period they allowed the expansion of livestock raising in the plain. They also have an important ecological role as a refuge for many aquatic and marsh plant and animal species.

The integrity of the *marcite* areas is still good. The *marcite* of Morimondo, extending over 23 ha around the homonymous abbey, still retain the canal grid layout and field sizes of the Middle Ages, although only a small part is submerged in the winter and hence remains "green". At Bernate, the *marcita* area, still owned by the Curia of Milan, extends over 13 ha. It is completely surrounded by woods and submerged in the wintertime. A long-standing farming business still cultivates it with care and commitment. The 72 ha of *marcite* at the Sforzesca are the property of Prince Castelbarco Albani Gropallo. The cluster of buildings in the middle of the area still retain features of the original fifteenth-century buildings, although around them many residential houses have sprouted with building characteristics that are

Fig. 9.5 The *marcite* are a management system introduced in the early Middle Ages by Cistercians and Umiliati monks

completely extraneous to the local agrarian landscape. In the *marcite* themselves, the original size of the sloping "wings" is still recognizable, as are water canals, drains, and sluice gates with their partially restored fixtures. Maintenance and management have been neglected in recent times, being costly and of no direct usefulness to agricultural production. This has led in many cases to deterioration of the grass cover and a loss of its botanical quality and utility as fodder.

In areas around Milan—even those now surrounded by urban sprawl, such as the Parks of Ticinello and Cave—there are still 225 ha of *marcite* still retaining their double or staggered "wing" structure and maintained using mechanical means. In the South Milan Agricultural Park, some farmers produce quality milk from livestock entirely fed with fresh fodder from *marcite*, notably the *marcita* of Cascina Tavernasco at Noviglio.

The vulnerability of these plots is high, because they need constant maintenance and specific subsidies are scarce. Hence, *marcite* are often "broken" and converted into grain fields. This trend is leading to the loss of one of the most distinctive historical features of the Po River plain. In livestock feeding, fresh grass has been replaced by silate, which is less expensive and available the year round. It is hence difficult to motivate farmers to resume cultivation of *marcite*, which require constant

and costly maintenance and an in-depth knowledge of water managing techniques. Irrigation water in general is scarce today, including that from historical springs, once an important source for the *marcite*, which today have been largely abandoned. Since 1988, the Ticino Valley Regional Park has been trying to give out subsidies to farmers to encourage them to maintain the *marcite* that are most significant from a historical and landscape point of view. Thanks to the enactment of the Progetto Speciale Agricoltura of the Lombardy regional government, the South Milan Agricultural Park has conducted a census of *marcite* and allocated subsidies for their maintenance. In 2008, the park inaugurated a visitor program, with itineraries going out from ten farmhouses to the *marcite* and other places of historical, naturalistic and architectural interest in the area. There are plans to create an "Association of *Marcita* Farmers of the South Milan Agricultural Park" to improve external visibility and nurture a sense of identity among farmers (Figs. 9.5, 9.6)

Land use 2009	Surface (ha)	Surface (%)
Water body	4.69	1.09
Urban area and courtyard	39.86	9.30
Arboricolture	110.21	25.72
Shrubland	5.42	1.26
Mixed wood of broad-leaves	28.33	6.61
Fallow	8.99	2.10
Marcita (irrigated meadow)	90.03	21.01
Vegetable garden	1.18	0.28
Meadow	0.39	0.09
Rice field	47.80	11.16
Arable land	79.27	18.50
Riparian vegetation	12.29	2.87
Total	*428.44*	*100.00*

Evaluating indices of landscape	
Number of land uses	12
Number of patches	222
Total surface area (ha)	428.44
Average surface area of patches (ha)	1.93
Average surface area of *marcite* (ha)	4.74
Average surface area of forest patches (ha)	1.64
Length canals (m)	57.519
Hill's diversity number	6.99
Class of landscape integrity (I–VI)	II

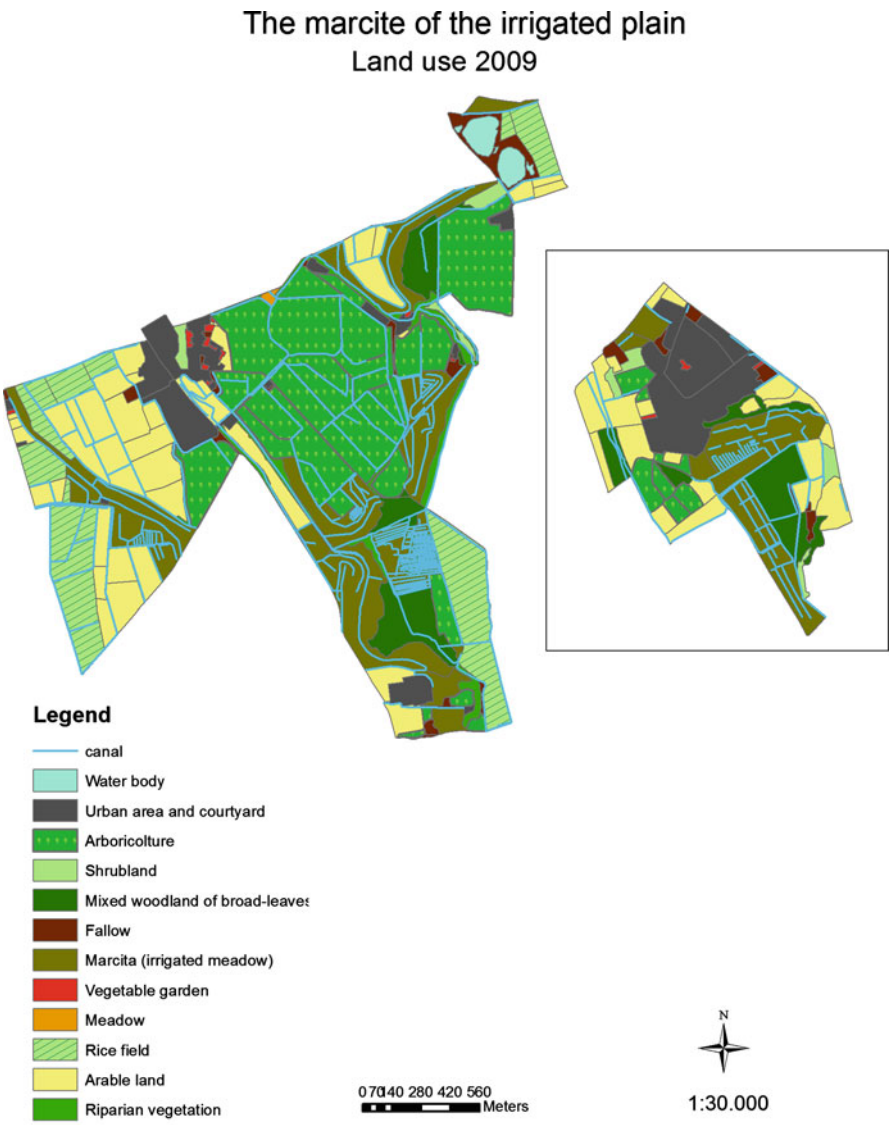

Fig. 9.6 The *marcite* are an ancient and effective type of permanently irrigated meadows. The surveyed area is covered by *marcite* for 21 % of its whole surface. The structure of the landscape is characterized by large-sized patches where water runs in small channels called *maestri* or *adacquatori*, from which it overflows, inundating the meadow and forming a thin tepid sheet over the grass cover. The channels for irrigation extend for about 57,519 m. The *marcite* landscape comprises scattered areas in the plain between Ticino and Adda rivers. Therefore, the assessment of the integrity cannot consider a single portion of territory, but rather scattered areas that need to be surveyed separately

9.7 Bird-catching Sites in Lombardy (Around Brescia: 46° 13′ 36″ N; 10° 25′ 00″ E—Around Bergamo: 45° 46′ 27″ N; 9° 38′ 43″ E)

This landscape was selected for the presence of *uccellande*, vegetable structures used for hunting locally known as *roccoli* and *bresciane*. Today they are found over an area with an overall extension of about 1,550 ha. They are often indicated in the Italian Military Geographical Institute maps. The area of Lombardy where many *uccellande* are still preserved lies within several municipalities in the provinces of Bergamo (notably in the municipalities of Colli di Bergamo, Val Seriana, Val Brembana, Val Gandino, and Val Cavallina) and Brescia (Brescian Alto Garda, Val Sabbia, and Val Trompia). They often can only be reached on foot. Many of these structures lie within the Regional Parks of Colli di Bergamo, Campo dei Fiori, Alto Garda Bresciano, Adda Nord, Groane, Valle del Lambro, Pineta di Appiano Gentile e Tradate, or within the Canto Alto e Valle del Giongo SCI. Some of these areas are under landscape restrictions. The *uccellande* are mainly concentrated in the Prealpine region. They lie at obligatory passage points along bird migration routes, such as rises, hills or mountain passes, in wooded areas or fields that are more likely to draw birds.

These structures, made by modeling trees into traps for various avian species, were once widespread in Italy. They owe their significance to their historical persistence and uniqueness. *Roccoli* are documented in Italy at least as early as the 1400s, especially in Lombardy and Veneto. A 1931 census reports 880 *uccellande* in Lombardy and 587 in Veneto. *Uccellande* have a round or horseshoe-shaped plan, about 50–60 m in diameter. They are bordered with trees (usually hornbeam, *Carpinus betulus*) arranged and pruned so as to form windowed vegetable tunnels concealing vertical bird-catching nets. They also have a wooden pergola, known as *tondo*,completely covered with regularly pruned vegetation. Annexed to this is a three-story masonry tower, the *casello*, or a hut, hidden in dense vegetation, where the hunter would hide. In the innermost part of the *roccolo* is the highest tree of all, surrounded by a grove of progressively shorter trees. In cultivated areas in plains or low hills, *uccellande* with rectangular plans were sometimes used. These are known as *bresciane*. They differ from *roccoli* not just in plan, but also for the absence of trees inside the pergola, which is occupied, instead, by grass or pasture shrubs. Thus, *roccoli* are elaborate "vegetable buildings" requiring continuous and programmed maintenance. This was once performed by *roccolisti* (or *roccolanti*). A *roccolo* was often associated with other *roccoli*, forming a complex, highly distinctive landscape system in which practical utility (birding used to be an important source of nourishment for foothill and mountain populations) went hand in hand with aesthetical and decorative considerations.

As regards integrity, many *roccoli* are still quite well preserved. Some are kept in activity employing traditional techniques, capturing birds for ringing for scientific purposes or to supply decoys for species whose hunting is allowed in Lombardy. In the region, about forty *roccoli* are authorized to capture over 40,000 birds. Other *roccoli* still retaining their arboreal structure are used as bird-watching stations or as a feature in public or private parks. Most *roccoli*, however, have disappeared or are reduced

Fig. 9.7 View of a bird-catching site in Colli di Bergamo Regional Park. It still conserves its historic architectural and vegetational components

to vestiges integrated into the woods. Censuses of *roccoli* recently conducted in the Val Gandino and in regional parks where they occur located over 200, in different states of preservation. Of the recorded specimens, only about 10 % are still used for hunting. The rest have reverted to the wild or become a feature in private parks.

The vulnerability of these peculiar arboreal structures principally depends on the ceasing of their use for hunting ever since Law 799/1967 forbade this form of birding. Furthermore, *uccellande* are also threatened by improper use, deterioration, and radically altering works, which are leading to their gradual disappearance. It is thus necessary to take account of *uccellande* in agricultural policies and land and landscape planning. They are features of the local landscape and environmental heritage, testimonies of an ancient folk culture that are worth conserving and maintaining as a complex system that is highly characteristic of the rural landscape of Lombardy and Veneto (Fig. 9.7).

9.8 Val Muggiasca (46° 02′ 00″ N; 9° 20′ 00″ E)

The mountain landscape system of Muggiasca extends over about 1,000 ha, mainly privately owned. It lies within the municipality of Vendrogno (LC), along the right bank of the Pioverna torrent, before it expands to form the Bellano sul Lario alluvial fan. The altitude of the area within the territory of the commune ranges from 265 to

1,800 m a.s.l. Vendrogno can be reached from Bellano, on the east bank of the Como Lake, by driving 5.5 km on the road going through Pradello. Its sub-municipalities (Sanico, Mornico, Mosnico, Noceno, Inesio and Comasira) extend up the southwest slopes of Mount Muggio, from which the area derives its name of Muggiasca. The area is placed under landscape restrictions as per law n. 431/85. The Val Muggiasca, extending from Bellano to Tartavalle, is a narrow glacial trough of torrential origin. Water erosion and the calcareous nature of the Prealps have given rise to morphological features such as glacial kettles (Tomb of Taino), cascades, and residual glacial morphologies such as terraces and scattered boulders. Monte Muggio, which overlooks the valley, is a large mountain with a rounded shape that stands in complete isolation, offering a view of the Valsassina, the lakes of Como and Lugano, Monte Rosa, Monte Cervino and the Swiss Alps. The area lies within the northern sub-Alpine strip of the province of Lecco, which is characterized by the presence of metamorphic rock and some important mountain chains. Hydrographically, the area belongs to the Adda basin, a sub-basin of the Pioverna torrent.

The landscape system of the Val Muggiasca owes its significance to the historical persistence of the typical physical features—woods alternating with pastures, meadows, small terraces and contour terraces—associated with "vertical" farming and livestock-raising; that is, the seasonal migration of farmers, herdsmen and livestock from the lower versants in the winter to the upper ones in the summer. This practice, known as *alpeggio*, dates all the way back to the Middle Ages. Beginning from the bottom, first come the permanent settlements, with small terraces where vegetables, potatoes, rye, buckwheat, and especially grapevine are grown. From here all the way up to the high altitude zone are meadows and pastures interspersed with large woods with chestnut trees, including some monumental ones. The permanent settlements are of medieval origin. They are of the centered Alpine type, with homes separated from stables, barns, and other farm buildings. There are many churches, whose steeples are a prominent feature of the settlements. Besides local routes such as paths and mule-tracks, important ancient routes connect the banks of the lake with the Valsassina.

Similar landscapes systems are found in many other valleys in the Alps, but the Val Muggiasca owes its integrity to the preservation through the centuries of its historical use, down to the present day. On the north versant of Monte Muggio, which has been only slightly impacted by anthropic activities, vast woods are still present. The Monte Muggio area includes many pasture areas. Notably, the *alpeggi* of Chiaro and Camaggiore are still active. Indeed, meadows and pastures are a significant landscape feature of the area. One of its most characterizing structural elements are contour terraces and terraced meadows. These can be seen especially in the wintertime from the opposite bank of the Pioverna. The villages still retain strong Medieval historical traits. A dense web of foot trails still connect the seasonal permanence zones and residential clusters. Some of the mule-tracks and paths, however, are asphalted today to allow motor traffic. The local population display a quite good awareness of their history. Since July 2008, a "Museum of Milk and of the History of the Muggiasca" has been open in Vendrogno, housed in a former municipal dairy.

Fig. 9.8 The pastoral landscapes cannot be separated from the grazing activities needed to maintain them

As regards vulnerability, it is increasing as a result of the partial abandonment of the valley versants, the decline of agriculture and livestock raising, and the consequent abandonment of pastures, especially the least accessible ones. The woods are gradually extending over terraced fields and meadows. More tracks and trails may to be asphalted in the future, allowing motor vehicle traffic in excess of the area's capacity. New uses of rural buildings have led to often incongruous renovations that do not blend well into the local landscape (Fig. 9.8).

9.9 Terraced Vineyards of the Valtellina (46° 10′ 31″ N; 09° 54′ 05″ E)

The terraced vineyards of the Valtellina extend over about 500 ha, with altitudes ranging between 300 and 700 m a.s.l., on the Rhetian versant of the valley, facing south. They lie within the municipalities of Sondrio, Montagna in Valtellina, Poggiridenti and Tresivio (SO), and are mainly privately owned. The area is partially included in the Orobie Valtellinesi Regional Park, now an EU Special Protection Zones. The area is accessible by SS 38, which runs through the valley. To reach the vineyards, one drives eastward for about 3 km from the center of Sondrio to Piano. From here,

one takes Via Don Guanella, which goes up the versant to Montagna in Valtellina. The other communes lie eastward from here along the versant, at the same altitude. The Valtellina is located in the extreme north of Lombardy, along the Swiss border. It extends for 119 km from east to west, along the upper stretch of the course of the Adda, down to the Como Lake. There are Pleistocene glacial deposits on the valley bottom, and schist and mica schist between the valley bottom and the lower versants. The latter are in many cases the result of recent alluvial fanning. The main versants, instead, are constituted by moraines of post-Wurmian origin, with abundant gneiss and migmatite formations.

The area owes its significance to the historical persistence of viticulture on dry-stone terraces along especially steep slopes, with gradients sometimes higher than 70 %. The result is a spectacular landscape. Grapevine is grown all over the Valtellina, especially between Ardenno (16 km west of Sondrio) and Tirano (22 km east of Sondrio). The area selected for the present work is hence the central part of the valley. Historical documents indicate that these terraces were mainly built between the tenth and fourteenth centuries, allowing the farming of very acclivitous slopes by strenuous shaping of the mountainsides. It is mainly monks who started the interminable work of clearing woodland and building terraces to allow the growing of grapevine along the Rhetian versant. Viticulture attained its peak expansion in the nineteenth century, when over 6,000 ha of vineyards were recorded in the valley, vs. about 1,000 recorded in 2006. They are arranged onto narrow terraces that are themselves quite steep. Human occupation of the slope is rhythmically cadenced by housing clusters lying at intervals along tracks halfway up the Rhetian versant. As a rule, terraces were built from the bottom up. A low wall was erected with stones usually obtained from the immediately overlying slope. Some debris was probably spread onto the whole surface of the cut to improve drainage and reduce the push of the earth against the wall. Above this draining stratum, a layer of manure mixed with earth from the cut was spread. In areas where emerging boulders abound, one commonly finds terraces onto small rock shelves, bordered by a wall. These terraces were covered with earth dug up in nearby cavities. Better quality earth was sometimes brought up from below, but only as a last resource. The Valtellina has a much more favorable climate than other mountain areas at the same latitude, allowing the production of an excellent Nebbiolo wine, also favored by other concomitant factors. Due to the valley's west-east alignment, its whole northern versant faces south. Its steepness increases its irradiation, since at the latitude of Valtellina it allows a higher concentration of solar energy than in level areas. The dry-stone walls also contribute to the maturation of the grapes by absorbing heat during the warmer hours and releasing it during the cooler ones. These characteristics, along with the erosion reduction and hydrogeological stability ensured by the terraces, contribute to the environmental significance of this historical landscape system. The area produces quality wine. DOC (Controlled Origin Denomination) recognition has been granted to Valtellina Rosso, and DOCG (Controlled and Guaranteed Origin Denomination) to Valtellina Superiore and Valtellina Sforzato.

Fig. 9.9 The terraces of Valtellina date back to the tenth–fourteenth century. They are characterized by peculiar building techniques and specific landscape features

The selected area's integrity lies in the fact that the present viticultural landscape still maintains not only its terraces, but also most of the extension it had in the nineteenth century, unlike what happened in other parts of the Valtellina. Some parts, however, have been abandoned and reclaimed by the forest. Some owners have switched their terrace vineyards from *rittocchino* to *girapoggio*, partially changing the shape of their vineyards, although terrace structure has been left unaltered. Settlement expansion has remained limited and has followed contour lines.

As regards vulnerability, objective difficulties in the cultivation of terraced areas and high production costs are gradually leading to the abandonment of farmland, not just at high altitudes, but also, in recent years, at lower altitudes where landscape and environmental value is higher. Wine production in the area can still guarantee very high quality, but a collective effort is called for to safeguard a product with unique characteristics, not reproducible in other habitats. It is also important to maintain the terraces as a protection against hydrogeological risk. The area is characterized by high property fragmentation, low mechanization, difficulties in transporting the grapes, and high access costs. In 2003, local producers formed the Consorzio Tutela Vini di Valtellina, and local institutions established the ProVinea non-profit foundation to protect the land, landscape and vineyard terraces of the province of Sondrio, and safeguard and promote local cultural-historical traditions

and cultural and environmental heritage. ProVinea engages in actions to valorize and protect the local landscape and environment, such as the maintenance of structures with landscape value, retaining walls and routes, especially in the terraced vineyard system. The foundation collaborates with the authorities and local institutions to achieve its objectives, and takes action, legal as well as otherwise, in defense of the environmental, landscape and cultural balance of the local wine country (Figs. 9.9, 9.10).

Land use 2009	Surface (ha)	Surface (%)
Water body	0.58	0.08
Bare rock	0.35	0.05
Urban area and courtyard	135.46	19,63
Arboricolture	0.36	0.05
Shrubland	23.68	3.43
Archeological area	0.45	0.07
Woodland	146.43	21,22
Fruit orchard	15.67	2.27
Unproductive	0.82	0.12
Fallow	40.87	5.92
Unclassified	2.48	0.36
Olive grove	0.89	0.13
Terraced vegetable garden	25,74	3.73
Terreced vegetable garden with fruit orchard	1.99	0.29
Pasture	0.28	0.04
Meadow	26.87	3.89
Meadow with tree	10.89	1.58
Terraced meadow	5.01	0.73
Arable land	4,61	0.67
Arable land with fruit orchard	1.81	0.26
Arable land with vine	0.07	0.01
Vineyard	3.06	0.44
Terraced vineyard planted along the contour of the hill	16.30	2.36
Terraced vineyard planted perpendicular to the slope	219.55	31.82
Vine with tree	0.27	0.04
Abandoned terraced vineyard	5.21	0.76
Nursery	0.28	0.04
Total	*690.00*	*100.00*

Evaluating indices of landscape	
Number of land uses	27
Number of patches	2,186
Total surface area (ha)	690.00
Average surface area of patches (ha)	0.32
Average surface area of arable land patches (ha)	0.23
Average surface area of forest patches (ha)	0.74
Hill's diversity number	7.49
Class of landscape integrity (I–VI)	IV

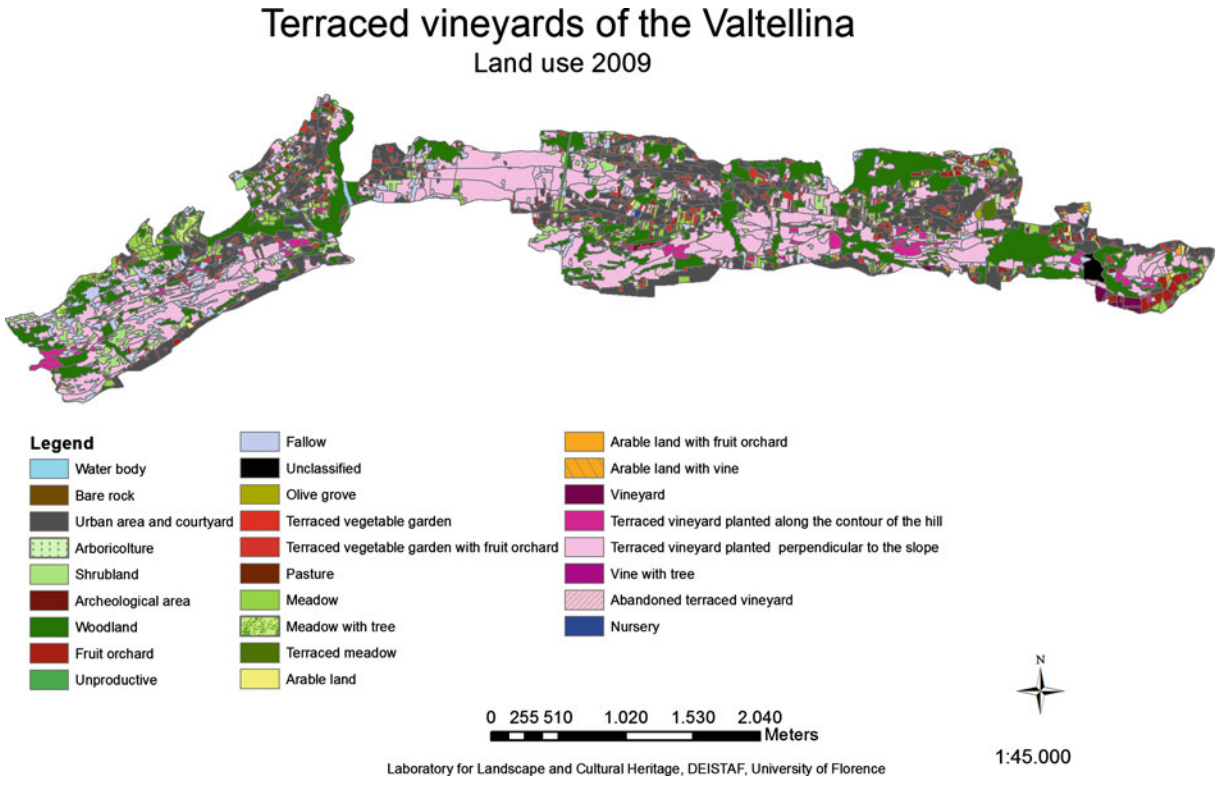

Fig. 9.10 The landscape of the Valtellina is characterized by dry-stone terraced vineyards and other mixed crops interrupted by small woodlands on very steep mountain slopes. Monks started to build terraces between the eleventh and fourteenth century. The vineyards occupy 31.8 % of the surface, mixed crops and orchards approximately 5 %, while the forests extend for 21.2 %. Several land uses and small patches characterize the landscape mosaic, with a very high level of fragmentation. As regards to the agricultural sector patches shows an average area of only 0.23 ha. Overall, the historical landscape has a high level of integrity

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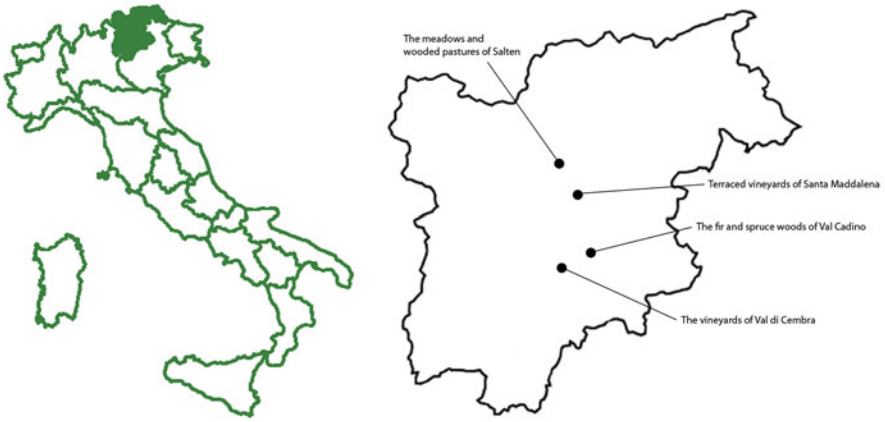
Chapter 10
Trentino Alto Adige

Mauro Agnoletti and Rita Biasi



10.1 Trentino

Mauro Agnoletti

An alpine area criss-crossed by deep valleys, Trentino owes many of its landscape features to its geographical morphology. Nevertheless, humans also played an important role in shaping it over the centuries, reclaiming valley bottoms and wresting mountain areas from the forest to clear up space for agriculture and grazing. Forests dominate the landscape, accounting for 65 % of the surface of the province, while cultivated

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fields only cover 4.3 % and pastures 19 %. The Utilized Agricultural Surface (UAS) thus amounts to 23.6 % of the total. While limited in extension, however, it is an agriculture of long historical persistence. The earliest remains of terracing apparently date back to the Iron Age, and are thus a testimony of the early adaptation of man to a difficult environment with very steep slopes and boggy valley bottoms. During the second millennium B.C. the area appears to have been inhabited by the Raetian ethnic group, whose settlement pattern was characterized by a sequence of fortified citadels along the main valleys, with stable farming, crop rotation, and a reduction of the practice of slash and burn. By this time, high-mountain summer grazing with the shepherds residing in permanents shelters, and milk and cheese production appear to have been well established. The excavations of San Zeno in the Val di Non unearthed a whole array of agricultural and forest equipment as early as the fifth century B.C., and hence predating Roman domination. The vineyard landscape became important in the area especially during Roman times. Horace describes a landscape of castles and grapevine. Raetian wine became fashionable at Augustus' table. The wines of Trentino, however, had been exported since long before, for example towards the Danube area. A bronze situla (a bucket of sorts) carrying an incised inscription in a "northern Etruscan" alphabet found in Val di Cembra appears to bear witness to the importance of viticulture in the area; hence our decision to pick the terraced vineyards of Val di Cembra as one of the two areas selected as representative of Trentino for the catalogue—although just two hardly do justice to the variety of the region's landscapes. Besides carrying out the centuriation of the countryside, the Romans were also the first not only to deforest the area, but also to exploit its forest resources, discovering the qualities of Trentino woods, including the highly resilient larch. The felled logs were transported to the port of Ravenna, and from there shipped to Rome, circumnavigating Italy. After the fall of the Empire, in Trentino, as in many other areas, cultivated surfaces reverted to woodland. As elsewhere in Italy, however, the Middle Ages soon witnessed a revival of agriculture, marked by the expansion of olive groves and especially vineyards, partially in mixed forms combined with the growing of grain and fruit trees. A system based on *frate*—small, often terraced plots wrested from the forest—gradually developed, along with private holdings and *masi*, a system derived from feudalism based on self-sufficient peasant families. The agricultural landscape features a variety of forms of land modeling: lunettes and contour and plain terraces alternate with grids and ploughed fields on parallel strips, with abundant trees, contrasting with the relative simplicity of the region's silvopastoral areas. The fifteenth century saw the start of gradually increasing massive exploitation of the forest for timber. This was one of the main factors in the modification of the forest landscape, eventually outweighing the exploitation of the forests for mining purposes. The development of the community system; the rule of bishops; the influence of the counts of Tyrol, of the Empire, and then of Venice, which dominated the southern part of the region for about a century straddling the year 1500; all this took place against the background of a gradual reorganization of the Alpine space to meet the demands of timber productions. Logs were floated down almost all the Alpine torrents, and rafts loaded with lumber regularly crossed the Adige to the west and the Brenta to the east. Elaborate equipment including chutes, splash dams and water-powered sawmills allowed growing production and significant revenue for the local

communities and their noble and ecclesiastical rulers. From the end of the nineteenth century onward, deforestation processes are no longer observable. There was, however, a gradual specialization of the woods towards the production of conifer timber, especially of silver fir and spruce, and a decline of coppicing, used up to then as a source of firewood. Within a century, conifer woods even doubled their areas in some valleys, making Trentino the most important timber-producing region in Italy. This stimulated phenomena of industrial growth, such as the presence of over 400 sawmills scattered over all the valleys, and the foundation of the Feltrinelli firm, to become one of the first multinational companies. The text on Val Cadino, which lies in the area of the Magnifica Comunità di Fiemme, documents the extant forest landscape that is most representative of this historical process. The timber industry lost much of its economic importance after World War I, and further declined after World War II, as a consequence of increasing importation of timber from abroad and deep changes to the region's economy, which today is driven by the tertiary sector, and especially tourism. As Aldo Gorfer wrote, the industrialization of agriculture over the last few decades has unfortunately almost effaced the traditional agricultural landscape, leaving only vestiges in limited areas. In general, today fruit and wine growing are carried on using modern methods that have deeply modified traditional orchard architecture, and valley bottoms are occupied by urbanization and infrastructures. Compared to the agricultural landscape, forests and pastures have retained more of their historical character, in spite of the impact of processes of spontaneous reforestation. There is thus a strong contrast between urbanized areas, intensive agriculture areas, and prevalently silvopastoral ones. In these last, however, much emphasis is often being placed on a "naturalness" that, while it certainly meets expectations and reflects perceptions that are widespread among the general public, seems to deny their historical origin.

10.1.1 The Fir and Spruce Woods of Val Cadino (46° 14′ 45″ N; 11° 25′ 05″ E)

This 1,000 ha, mainly publicly owned area includes an ample portion of the forest of Val Cadino, one of the lateral valleys of the Avisio torrent. It lies within the municipalities of Valfloriana, Castello-Molina di Fiemme, and Cavalese, in the province of Trento, at altitudes between 830 and 2,300 m a.s.l. It is included in the Val Cadino SCI and the Lagorai ZPS, and under landscape restrictions as per Laws 1497/39 and 431/85. The area can be reached from SS 48, which runs in the Val Di Fiemme. From here one drives on to Castello di Fiemme on SS 612 and takes the provincial road to the Val Cadino at Segheria, going across the Avisio torrent that runs down the Val di Fiemme. The geological substratum of the valley bottom is formed of morainic Wurmian deposits, also found along some of the mountain slopes. The mountains, however, are largely composed of Adige volcanic substrata (gray rhyolitic ignimbrite). The orography of the Avisio basin is quite uniform on its southern versant, whose acclivity ranges from inclined to steep, with small level or craggy areas; the latter are mostly found along the banks of small deep-set valleys and fairly deep logger's tracks (*tovi*) that break the uniformity of the slopes.

The area owes its significance to the historical persistence of a landscape modeled over the centuries by forms of management based on communal ownership and focusing on timber production. The landscape thus includes timber transportation structures and sawmills. Its history is the same as that of the Val di Fiemme as a whole. It was Roman from the first century B.C. onward. After the fall of the Empire, barbarian populations overran the whole Adige valley, forcing the population to seek shelter in the neighboring valleys, including the Val di Fiemme. After a period of Lombard domination, in the year 1000 it was included in the bishopric of Trento. Around 1300 the Comunità di Fiemme was established, later renamed "Magnifica Comunità di Fiemme". In the nineteenth century, after the French and Germanic dominations, the area came under the control of the Austro-Hungarian empire. It was returned to Italy in 1918, at the end of the Great War. From the fourteenth century onward, the valley gradually began to exploit its timber resources. To this purpose, it developed woods dominated by conifers (fir and spruce) suitable for the production of lumber, a process involving an elaborate range of activities regulated by the Comunità di Fiemme. The process intensified from the late nineteenth to the late twentieth century, with an increase of conifers from 84 to 99.5 % between 1892 and 1970, although in other valleys in Trentino the percentage of conifers doubled over the same period. While in Val di Fiemme there is a prevalence of spruce, in Val Cadino one finds a significant presence of silver fir. The management of the local woods is distinctive for its employment of clearcutting, locally known as *taglio a fratta*, a term derived from Latin indicating a silvicultural technique whereby all the trees in a given portion of a forest are felled. To increase the efficiency of woodland management, a transportation system was developed employing *risine* or *cave*. These are gravity chutes made of wood or stone built along mountain slopes to allow the transportation of logs during the winter, when the ice and snow reduced friction. There were also *stue*, splash dams built along torrents to accumulate large quantities of water which once released carried the logs miles downstream. Another fundamental element of this system were water-powered "Venetian-style sawmills". At the end of the nineteenth century there were about 80 of these in the whole Val di Fiemme. The Val Cadino is also known for the Manghen Pass, named after a winch used to haul the logs up to the pass and from there down to the Val Sugana. The Comunità di Fiemme depended on the revenues of the timber trade for the financing of public works and the purchase of food supplies. It thus wove complex trading relations with the surrounding valleys and the plain areas. The valley is one of the most significant examples of a forest landscape modeled to produce timber, and is thus highly representative of local history and culture. Its features are typical for most of the woods of the Italian northeast, which used to be the most significant timber region in Italy.

The wooded part of the valley landscape still appears essentially intact, since the timber production is ongoing. It is thus still dominated by conifers. The general economic context, of course, has changed. Timber production is no longer the driving force of the economy of Trentino and the Fiemme area, although it remains important at the local level. The valley and the Magnifica Comunità are still strongly attached to their cultural roots and to the historical role of the forest. This is manifested in their engagement in conservation activities and the preservation of historical documents and constructions. Both in Val Cadino and Val di Fiemme there are still stone chutes

Fig. 10.1 Part of a stone *cava* in Val Cadino. These traditional transportation systems are a unique feature of this Alpine area

and water sawmills. Some of the sawmills have been restored, although many others have disappeared. Compared to the urbanization and the growth of road and tourism infrastructure in Val di Fiemme, the Val Cadino is still well preserved.

The area's vulnerability depends on the lessened importance of timber production and the uselessness of the historical structures in the current mechanized logging and timber transportation process. A couple of decades have now gone by since a restored stone chute in the nearby Val Sorda was used for wintertime logging undertaken to preserve knowledge of traditional methods, although the purpose was still essentially economic. Another problem is the lack of regular maintenance of the surviving structures and the lack of a general program for the restoration and valorization of the local documentation on the history of forests in a man-shaped mountain environment (Fig. 10.1).

10.1.2 The vineyards of Val di Cembra (46° 09′ 39″ N; 11° 10′ 47″ E)

The vineyard area in Val di Cembra extends over ca. 1,000 ha within the municipalities of Cembra, Lisignago and Giovo, in the province of Trento. The vineyards are mostly privately owned and lie at altitudes ranging between 370 and 900 m a.s.l. The area is under landscape restrictions as per laws 1497/39 and 431/85. It can be reached from SS 612 from Lavis, north of Trento. From here one drives for 13 km

to Cembra (on the "Road of Wine") along the orographic left side of the Avisio. Past Cembra, vineyards become sparser. The road goes on for another 26 km to Molina and then into the Val di Fiemme. The Val di Cembra lies onto the "Adige Porphyric Platform", the most vast porphyry area in Europe, which extends from Merano to Passo Rolle. This very hard rock foundation was partially excavated by water, first from glaciers and then from the Avisio torrent, which runs from east to west down to the Adige river. The orography of the southern versant, the one where the vineyards are, is quite uniform, with inclined to steep slopes and limited level areas. The left versant of the valley, where most of the porphyry quarries are, has a harsher morphology. Here steep and craggy zones alternate with landslide zones and a few cliffs.

The area owes its significance to a landscape strongly characterized by grapevine growing, an heirloom of the Raetian civilization, based on a centuries-old manmade remodeling of the versants. The terraces supported by dry-stone walls are the valley's most significant landscape feature. Grapevines are mainly grown employing traditional Trentine pergolas: the trunk is made to grow upwards to a height of 1.3–1.5 m, and then the fruit-bearing branches are made to extend on a slant and transversally to the row. The result is a system of interconnected "roofs" of foliage slightly tilted up on the upslope side. Along with the pergola, over the last years some espalier systems have reappeared, such as the Guyot and the *cordone speronato*, which consist in orienting the fruit-bearing foliage in the same direction as the row and making the vegetation grow along a vertical plane. Vineyards employing these systems appear as a series of parallel hedges arranged in a comb shape. At higher altitudes are woods of chestnut and beech, as well as black pine, forest pine and European spruce. An inscription praising the quality of the local wine on the "Cembra Situla"—an exquisite Etrusco-Raetian bronze basin dating back to the seventh or sixth century B.C. and probably used in rites in honor of Bacchus—bears witness to the early flourishing of viticulture in the area. With the immigration of Celts from beyond the Alps, and especially of some Celtic groups of Galli Cenomani, the growing of grapevine and the production and commercialization of wine began to spread significantly in the Valley. The arrival of the Romans contributed to the perfecting of cultivation and processing techniques. Many testimonies in Latin literary works (Suetonius, Tibullus, Pliny and Cato) and Roman gravestones mention a thriving export of Trentino wines beyond the Alps. Wine production in the Val Cembrana shrank as a consequence of the collapse of the Roman Empire and barbaric invasions. Only in the fifteenth and sixteenth century were new vintages introduced and disseminated. Thanks to the Council of Trent (1545–1563) and the work of Mariani, an attentive chronicler of the Council, the wines of Trentino became known and appreciated even beyond the region's boundaries. On 10 March 1797, the Battle of Cembra was fought, in which Napoleon defeated the Tyrolese and wrought great destruction on the valleys' urban and economic fabric. In the second half of the nineteenth century, the very survival of the local grapevine was threatened by oidium, downy mildew and phylloxera. The crop fully recovered only during the twentieth century. Today the valley produces fragrant CDO-designated wines, most notably Müller Thurgau, Schiava, Nosiola, Black Pinot, and Chardonnay. The Müller Thurgau grapevine, in particular,

Fig. 10.2 The terraced vineyards shape the mountain slopes of Val di Cembra, showing a beautiful variety of colours with the change of the seasons

has found its ideal habitat on the terraces of this valley between 500 and 750 m a.s.l. Among the most interesting centers of local viticulture, the most noteworthy are Cembra, the chief town of the valley, housing the winery by the same name (the highest in Italy), and Giovo with its seven municipalities, a renowned production area for the wines listed above. The quarrying of porphyry for sculpting and flooring is the most important extractive activity on the north-exposed versant. Slabs are extracted from vast quarries, worked locally and exported all over the world.

The historical viticultural landscape of the Val di Cembra has retained its integrity to this day as a remarkable result of human action on a given orographic substratum that gave rise to the present mosaic of vineyards on terraces and porphyry quarries. The present situation is the result of a gradual expansion of the vineyards, which today cover extensive continuous surfaces. Compact and distinctive mid-altitude rural villages, terraces with vineyards, and field tracks going down from the mountain to the valley bottom together form a well-defined landscape structure that has survived down to this day. Part of the reason for the conservation of this landscape is the fact that it produces high-quality wines and certainly not just for the local market. Furthermore, the area's high acclivity does not allow widespread mechanization of agriculture at the expense of traditional systems.

The main threat to the vineyards of the Val di Cembra is that the recurrent economic crises of viticulture may lead to an intensification of the production of porphyry. Porphyry extraction has been increasing since World War II. The multiplication of quarries, expansion of waste dumps, and abandonment of exhausted sites has

resulted in a constantly changing environment, placing the traditional identity of the landscape at risk. Today an effort is being made to conserve the landscape in view of a sustainable development founded on a balanced relationship between social needs, economic activity and the environment. The aim is to combine quarrying with landscape enhancement for tourist, cultural and social purposes; for example, by recycling porphyry waste for the aesthetic improvement of the area (Fig. 10.2).

10.2 Alto Adige

Rita Biasi

When one thinks of Alto Adige, what comes to mind are picturesque images of valleys and mountains, forest of firs, larches, pines, small villages and ample pastures, well-kept hay fields and carefully cultivated orchards, vineyards, neatly arranged fruit-groves and gardens. This layout is indeed typical of the area, and, like many others in Italy, it has been profoundly shaped by human presence, in contrast with the "naturalness" that people often attribute to it. This part of Italy, too, on the other hand, has been affected by the homologation of the rural landscape caused by the industrialization of agriculture. A major factor in this homologation was the establishing of highly intensive cultivation systems, which, in fact, were first experimented in this area and then exported to other fruit growing areas of Italy. Nowadays these systems are still extensively adopted, though limitedly to the more suitable areas. Apple orchards alone amount to18,000 ha on a total of 23,248 ha used for the cultivation of trees (i.e., "colture legnose agrarie", ISTAT 2000). Those who are familiar with this area, a land of both heavenly beauty and violent conflicts, know that this system has been in use for many decades, ever since, in an area of forests and mountains, all suitable land began to be farmed by a population of *Bauern*, farmers be longing mostly to the German ethnic group. Nowadays, these farmers have turned into expert agricultural business people, while remaining firmly attached to their land. Thanks also to a system of state incentives due to the autonomous status of the Trentino Alto-Adige Region in Italy, farmers have been able to significantly improve their condition, achieving a well-deserved high economic and social status that is uncommon elsewhere in Italy. While in other areas of Italy the various traditional agricultural landscapes has been declining due to lack of public financial support, in Alto Adige the cultural landscape appears capable of resisting change, not only thanks to its harmonic integration with the natural landscape, but also to a sort of tacit willingness to pay the financial price necessary to preserve its scenicquality, which attracts a constant flow of tourists in the entire region. Alto Adige is a land with relatively few urban centers. One-third of the population of less than half-a-million lives in a handful of towns. This helps preserve the quality of the landscape. Most of the land of Alto Adige consists of mountains with woods (50.3 %), shaped, however, by the secular activity of farmers, who have used them for wood and pasture.

Farmed surface (267,414 ha, basically stable from the1980s to the present) (ISTAT 2000) may seem standardized, given that pasture and grassland amount to 89,9 %

of the total of the land, with fruit orchards and vineyards dominating the remaining percentage. But, notwithstanding this standardization in farming, Alto Adige retains an extraordinary unique rural environment, expressed in various types of landscapes, from the agriculture of mountain slopes, to the valleys, with their sub-Mediterranean vegetation, to the more barren Alpine valleys, to the lower valleys and gentler slopes, with their typical herbaceous corps, grape and fruit cultivations. Particularly important for local cultural identity are fruit-tree farming, and especially viticulture, which was already practiced by the Reti in the pre-Roman period, and the presence of wooded grassland and pastures, which are among the most beautiful and biologically diversified landscapes of the area. Meadows and pastures with larches are a cultural landscape associated with the traditional animal farming system of the *malghe* (shepherd'shuts), a highly picturesque feature of the traditional landscape, which is now declining throughout Italian mountain areas. We find here a combination of small settlements, small vegetable gardens, grassland, isolated trees, hedges, dry-stonewalls, fences, irrigation canals and other artifacts typical of traditional rural architecture. The area called Salten, in the plateau of Monzoccolo, has remained basically the same for thousands of years. The protection and use of the larch-covered grassland is one of the goals of Rural Development Plans of Alto Adige, as part of a strategy aimed at protecting the traditional landscape and exploiting the scenicvalue of the region. The identity of the landscape depends also on the vineyards, whose aspect varies according to the area of production on account of different pedoclimatic conditions, and whose grapes, often of localvarieties, are used to make typical and unique wines. Wine grape is one of the principal and more traditional products of Alto Adige. There has been, however, an increase in production, which have often had a negative impact on the structure of the traditional landscape. The approximately 5000 ha of vineyards in Alto Adige are concentrated in the hilly areas and on the mountain slopes below 660 m a.s.l. In the lower slopes of Val d'Adige and Val d'Isarco, the modernity of hedge systems often coexists with traditional Alto Adige terraced vineyards with pergolas. The traditional vineyard landscape is a unique combination of natural, agricultural and cultural elements, which should be preserved. One of the most interesting are as is that of the locality of Santa Maddalena, on the slopes of the mountains encircling the valley of Bolzano. The preservation of this environment is ensured by local farmers, the true custodians of these traditional landscapes, who share with other users of the land the merit of having understood the multi-faceted importance of their activity, respecting the "spirit of the place" they have inhabited for many generations.

10.2.1 The Meadows and Wooded Pastures of Salten (46° 37′ 09″ N; 11° 14′ 55″ E)

The area is located in the higher part of the plateau of Monzoccolo, and extends for about 1,000 ha. It belongs to the commune of San Genesio, in the province of Bolzano. It can be reached by exiting the Autostrada del Brennero toll-road at Bolzano Sud and following directions for San Genesio. The plateau of Monzoccolo extends for about 3600 ha and has a maximum height of 1,500 m a.s.l. Geologically,

it consists mainly of rock belonging to the Bolzano porphereic-quartziferous system. It basically corresponds to the mountains and slopes between the valleys of the rivers Adige and Sarentino.

The area is significant not solely because it is one of the largest larch covered meadows of Europe, a type of landscape that has been gradually disappearing throughout the Alps, but also to the combination of traditional historical features and splendid views of the Dolomites. The name Salten comes from the Latin *saltus*, which indicates a mixture of pastures, isolated trees and woods, an etymology that confirms the fact that this type of landscape dates back at least 2,000 years. Some of the larches are centuries old. On the highest peak, lies the parish church of Langfenn. According to Sereni, an Italian historian of agricultural landscape, the *saltus* was one of the most common landscapes of the Roman period. It was associated with open-range animal-farming and represented a typical Italian combination of natural and human elements. In Alpine areas, larch-trees, often isolated or in small clusters, help create beautiful sceneries, also because they are the only conifer that sheds needles in wintertime. Their color slowly changes throughout the autumn and this variety increases the beauty of the Alpine environment. This also thanks to the permeability to light of the larch tree which makes larch woods brighter than others. Especially where larch-covered grassland is more extensive, it constitutes an authentic oasis of vegetable and animal biodiversity, characterized by agricultural landscapes of great ecological and scenic value, true biotopes of the rural landscape. The middle and higher areas of the plateau consist of a series of wooded pastures, interspersed with actual woods, within which are located the villages of San Genesio, Valas, Montoppio and Cologna di sopra, as well as individual farmsteads with their fields. The alternation of wooded grassland and pastures, dotted by beautiful isolated larches, wooded areas and grassland for mowing, intensively used by farmers, creates a fascinating variety of landscapes that surprises visitors with its beauty in all seasons. The gentle and level terrain, and its proximity to urban centers makes the Salten easily accessible to people of all age groups, providing an important recreational area for the residents of Val d'Adige and for local tourists. Another interesting feature of the area is the widespread presence of the Avelignesi horses, locally known as "Hafling horses" or "Haflinger," from the town of Hafling near Merano, a crossbreed between small mountain horses and heavier species, bred in the nineteenth century.

The landscape has largely maintained its integrity. The regular mowing of the fields, albeit entirely mechanized, and the presence of grazing animals ensure the maintenance of wooded pastures and grassland. Within the area one finds categories of rural buildings of special interest, such as thatched hay-lofts and a few mills, picturesque examples of local rural architecture. The presence of tourist infrastructures built in a different style is the only element that negatively impacts on the traditional quality of the landscape. The province of Bolzano has passed measures to ensure the preservation of this typical landscape for future generations. More specifically, the landscape plan (*piano paesaggistico*) of Monzoccolo was established already in 1981, and protects surviving larch groves in the plateau and wooded areas in general. Through the Rural Development Plan of 2007–2013, financial incentives are provided for those who continue to use traditional forms of agriculture and farming in the area.

Fig. 10.3 The larch-wooded pastures of Salten very probably date back to Roman times

As for the vulnerability of the area, wooded grassland and pastures are threatened by two opposite but equally dangerous trends. On the one hand, declining revenues are leading farmers to abandon their activities, which allows woods to replace pastures and grassland. On the other, the increasing adoption of mechanized systems causes a change in mentality, so that isolated trees are increasingly seen as an annoyance and scarcely fertilized grasslands as an inefficient use of the land. Other threats to the area are posed by increasing car traffic, by an excessive numbers of tourists in the wooded areas, and by a number of "improvements" to the holdings, which often lead to the elimination of small but important bodies of water. Last but not least, from a cultural perspective, a problem is the fact that almost all tourist guides tend to confuse the *saltus* with the forest, presenting the *saltus* as an example of an entirely natural landscape. Obviously, the fact of not acknowledging the human origin on the landscape influences public perception of the landscape and ultimately protective legislation (Figs. 10.3, 10.4).

10.2.2 Terraced Vineyards of Santa Maddalena (46° 30′ 06″ N; 11° 22′ 20″ E)

The area includes about 300 ha of terraced vineyards in the small village of Santa Maddalena, in the province of Bolzano. It can be reached by exiting the Brennero toll-road at Bolzano Nord, continuing towards Bolzano, and then

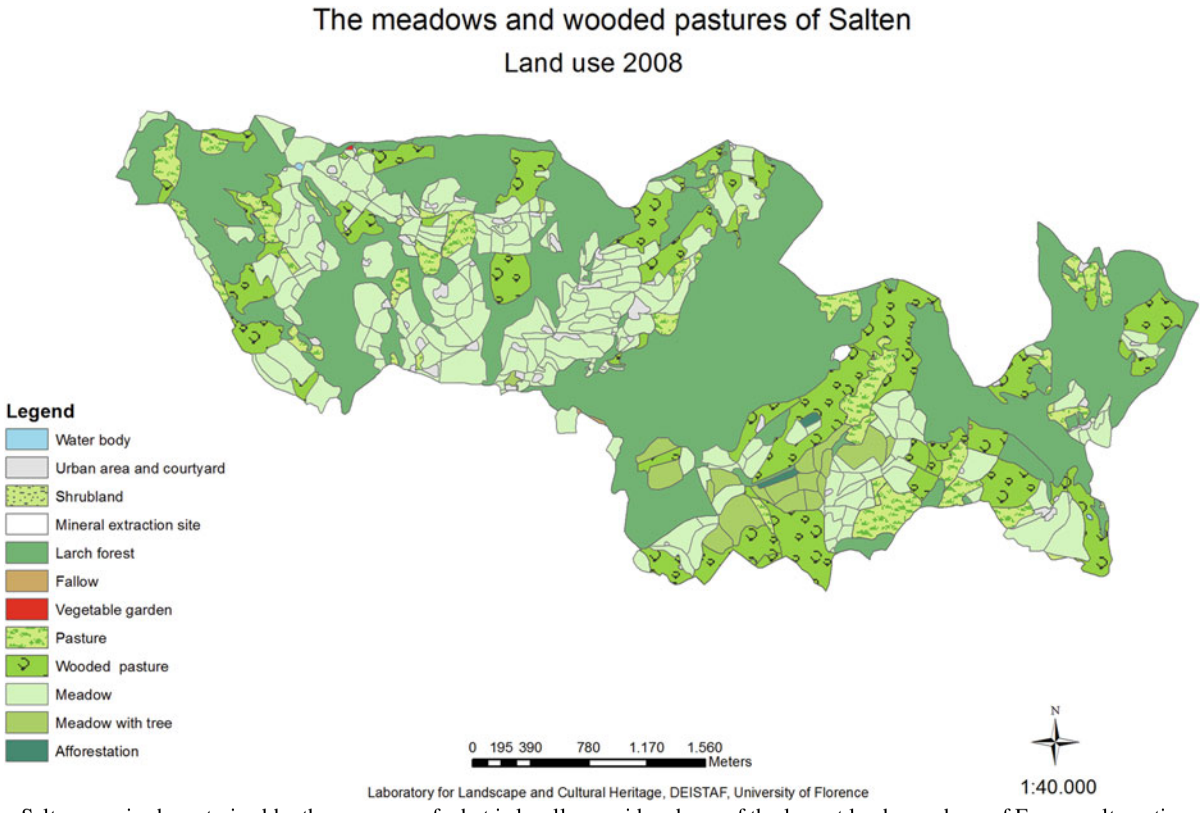

Fig. 10.4 The Salten area is characterized by the presence of what is locally considered one of the largest larch meadows of Europe, alternating meadows and wooded pastures with forests. The integrity of the historic landscape is still high since meadows and pastures cover 52 % of the territory and the larch forest (46 %) is always been part of this landscape

Land use 2008	Surface (ha)	Surface (%)
Water body	0.23	0.02
Urban area and courtyard	17.74	1.50
Shrubland	0.99	0.08
Mineral extraction site	0.93	0.08
Larch forest	546.96	46.30
Fallow	0.40	0.03
Vegetable garden	0.12	0.01
Pasture	76.69	6.49
Wooded pasture	195.47	16.55
Meadow	302.84	25.64
Meadow with tree	37.02	3.13
Afforestation	1.91	0.16
Total	*1181.29*	*100.00*

Evaluating indices of landscape	
Number of land uses	12
Number of patches	435
Total surface area (ha)	1181.29
Average surface area of patches (ha)	2.72
Average surface area of forest patches (ha)	16.17
Average surface area of pasture patches (ha)	1.96
Hill's diversity number	3.97
Class of landscape integrity (I–VI)	VI

following directions for Santa Maddalena. The vineyards are located on porphyritic and morainic soil, between 280 and 380 m a.s.l. The combination of different soils and microclimates in individual holdings has always ensured the uniqueness of the wine of Santa Maddalena.

The church of S. Maddalena stands on a hill from which you enjoy the splendid view of the majestic massif of Catinaccio and of the lovely city of Bolzano. It is certainly one of the most significant feature of this rural landscape, together with the terraced vineyards. The area was already sacred in prehistoric times, as witnessed by the ancient religious artifacts that have been found. It became a Christian site in the late Middle-Ages. The church was restructured and dedicated to saint Magdalene at the beginning of the fourteenth century. At the time it was also frescoed by a painter from the North, evidently influenced by the tradition of the Holy Grail. This is suggested by the fact that at the center of the crucifixion scene he placed Magdalene, rather than Mary. Magdalene also figures prominently between the apostles and St. John in another fresco below. In front of the small church, from within the small vineyard on the hill, one can enjoy one of the most interesting views of the area. At the time, the cult of saint Magdalene was common not solely in Alto Adige but in the entire Old Tirol. The steep sunny terraces of S. Maddalena, S. Giustina, Rencio, Coste and S. Pietro are the key to the quality of the autochthonous grapes (Schiava and Lagrein), traditionally considered among the best of Alto Adige. From these two qualities of grapes, the "Santa Maddalena" DOC (Controlled Origin Denomination)

Fig. 10.5 The terraced vineyards of the Santa Maddalena hill

labeled wine is produced. This is where, in the Middle-Ages, the celebrated "Botzner Weine" (Bolzano wines) originated, which nowadays have been assigned the "classic" denomination label. This wine area represents one of the many instances of the Alto Adige winemaking tradition, which, while present in many parts of the region, is mostly concentrated, due to favorable climatic conditions, along the lower slopes and on the alluvial cones of the Val d'Adige.

As for the integrity of the original rural landscape, the slopes where vineyards are found are still characterized by a combination of different cultivations, each with its specific production system and varying combinations of scenic elements, such as bushes, hedges, meadows, rows of fruit-trees or isolated ones bearing apples, cherries, chestnuts and almonds, herbaceous and bulbous plants located under the "pergolas" or on the dry-stone walls of the terraces. These are authentic niches of precious animal and vegetable biodiversity combined with historical rural structures and monuments. The endurance of the integrity and richness of these landscapes is witnessed by the basic absence of change in land usage on these slopes. The reason is also that the slopes are often steep and difficult to cultivate, a factor which has stabilized the balance between forest, on the one hand, and fruit-orchards, vineyards, pasture-grassland, on the other. Fortunately the tendency to intensify cultivation is negligible, since terraced vineyards do not lend themselves to the unification of holdings. The main problem we have identified is the disappearance of certain minor elements of the rural landscape on the slopes. The replacement of old dry-stone walls with cement walls or cyclopic boulders is a serious problem for the traditional landscape.

The vulnerability of the area, besides the replacement of dry-stone walls, concerns the typical cultivation system of the Alto Adige "pergola," which risks being replaced by more modern espalier systems. As a distinctive feature of the landscape, the Alto Adige "pergolas" should be preserved, to bear witness of the traditional agricultural system, to continue to provide well-balanced habitats, characterized by high animal and vegetable biodiversity, and to support the quality of the landscape. From this perspective, the presence of a thick network of roads, foremost amongst them the Autostrada del Brennero toll-road, as well as the expansion of the city of Bolzano and the edification of buildings that are not always in line with local traditions, represent other threats to this small "enclave," which, while still maintaining its traditional aspect and the quality of its landscape, is negatively affected by the proximity of urban centers and major roads. As in the case of the wooded pastures of the Salten area, it would have been useful if the Rural Development Plan had established more precise guidelines to contrast the decline in the historical varieties of vineyard landscape and to favor instead its further diversification (Fig. 10.5).

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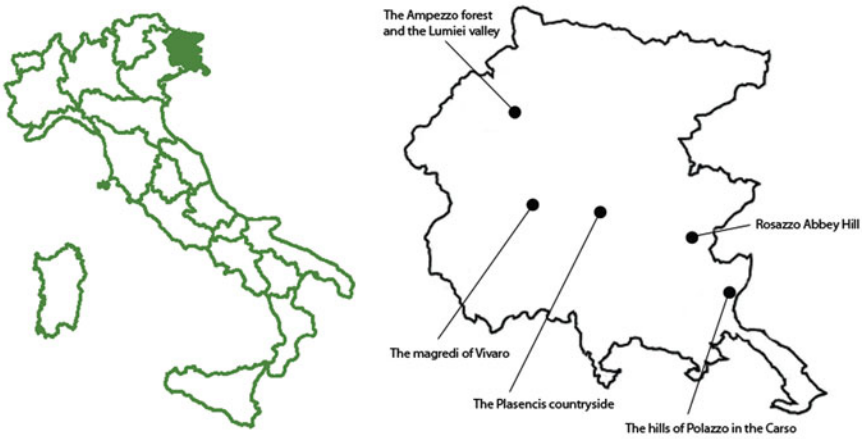
Chapter 11
Friuli Venezia Giulia

Claudio Lorenzini



11.1 Introduction

There is a definition of Friuli that its people and those of the Giulian area seem to be especially pleased with: it is the phrase "little compendium of the universe", coined by Ippolito Nievo for his *Confessioni d'un italiano*, which still stands, one hundred and fifty years later, as an especially apt characterization of the landscape of Friuli Venezia Giulia, a region with a great environmental variety and a contrasted history. Friuli Venezia Giulia boasts highly diverse environments, including vast mountain ranges occupying over a third of the region along the borders with Austria and Slovenia, many foothill areas, a fertile plain that is an eastward extension of the Po River Plain,

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and a diverse littoral area extending from the bay of Venice to Istria; to quote Nievo again: "Alps, plains and lagoons within sixty miles from north to south". Woods today cover 45 % of the region's surface, while the utilized agricultural surface amounts to 30.4 % (83 % cropland, 17 % pastureland). There was a remarkable increase of forest surface during the last century, concomitantly with the decline of agriculture. The region thus has a range of environmental features that are universal and, as such, extraordinarily diverse. This diversity forces landscape scholars to employ formulas such as Nievo's quoted above to provide a preliminary definition of the elements that distinguish Friuli Venezia Giulia from the other northeastern regions in Italy.

Nievo's literary characterization effectively highlights the complexity of the local environment. At the same time, it is misleading in that it ignores the changes that have taken place in the landscape. A later, more lucid literary gaze, instead, has helped to gauge the deep gap between what is here and what no longer is. Pier Paolo Pasolini's rewriting of the verses of the *Dedication* opening his first collection of poems, *La meglio gioventù*, reflects the dramatic acceleration of the transformation of the region's landscape, especially in the plain, in just three decades, or little more. From the "*meglio*" to the "*nuova*" *gioventù*, from the first drafts (1942) and editions to the "*seconda forma*" (1974), the water of the Casarsa fountain has gone from *frescia* (fresh) as no other to *vecia* (old). This land, says the poet, is no longer *me*, mine, it is unrecognizable. When one looks at what once was and no longer is, and what today people have trouble recognizing as "historical", some aspects that have characterized the history of the region's agricultural landscape can be made out. The complex landscape architecture of Friuli Venezia Giulia is not solely a consequence of the region's morphology and of economic changes. Being a region whose formation was the result of a strong political will, here there has been a stronger effort than elsewhere to emphasize the historical productive factors that contributed to the formation of the local landscape. Friuli Venezia Giulia remained divided between two different states until after World War I. Its dual political history influenced the region's economic and social, and, as a consequence, agricultural and landscape evolution. The region was a passage area, with a complex pattern of the circulation of goods and trade over borders. This situation that endured for a long time, in spite of attempts to address the problem. On the other hand, internal trade allowed a harmonious development of the region's different areas down until recent times. The forest resources of the mountains, for example, supplemented the fecundity of the plain. Essential commodities were exchanged between the two areas allowing a balanced and shared development. A distinctive development factor was the belated growth of the urban population, a gap that was only made up for from the eighteenth century onward, when demographic growth was accelerated by Trieste's rapid expansion. Another factor is an unusual persistence of traditional land ownership models. The nineteenth-century modernization of agriculture occurred here much later than elsewhere; when it finally did, however, the impact on landscape structure was significant. Land reallocation in the last decades of the twentieth century culminated in the ill-advised choice of monoculture, especially of maize and soy.

Today the economic and demographic imbalance between the plain and the mountain is constantly growing. The strong industrial and tertiary vocation that has

developed in the region since the 1976 earthquake has further contributed to radical changes in the rural landscape. Today, deep changes in agricultural models and crops are making it increasingly difficult to recognize elements of historical continuity and conservation in the landscape. All these elements make it difficult to provide an exhaustive picture of the region's rural landscapes, even if restricted to those of historical interest. While there was an inevitable degree of arbitrariness in our choice, we have picked five areas striving for the highest degree of representativeness: the mountains and forest of Ampezzo; the eastern hill area with the Abbazia di Rosazzo hill; the hills of Polazzo in the Carso Monfalconese; the countryside of Plasencis; and the *magredi* of Vivaro in the upper western plain.

11.2 The Hills of Polazzo in the Carso (45° 50′ 41″ N; 13° 31′ 01″ E)

This typical karstic pasture landscape extends over 150 ha, both publicly and privately owned, within the municipalities of Fogliano Redipuglia, Doberdò del Lago/Občina Doberdob e Ronchi dei Legionari, in the calcareous plateau extending between the Isonzo plain to the north and the Doberdò Lake valley to the east, which marks the limit of the Isonzo karst. The hills of Polazzo, a locality in the municipality of Fogliano Redipuglia and the central part of the area, lie in the southern portion of the plateau, whose most conspicuous features are elongated depressions with an average altitude of 114 m a.s.l. and the small lakes of Doberdò and Pietrarossa, which herald the Monfalcone coast. The area is included in the "Alture di Polazzo" rural park and two sites of the Natura 2000 network: ZPS Karstic Areas of Venezia Giulia, and SCI Triestine and Gorizian Karst. The town of Polazzo can be reached by SS 305 from Fogliano Redupuglia. Shortly before reaching the military cemetery, take Via della Stazione and continue on Via Fornaci, which leads to the Rural Park. The area's definition as "karstic landscape" highlights one of its main peculiarities. While "normal" landscapes are modeled by superficial water runoff, a karstic landscape is shaped by an intricate network of underground flows. In the Polazzo hills, the corrosion and dissolution of calcareous rocks has given rise to undulated plateaus and closed depressions known as *doline*. The latter are sub-circular or oval hollows of variable sizes, with diameters ranging between a few meter and several tens of meters. They are found by the thousands in karstic plateaus (Fig. 11.1).

The area owes its significance to the uniqueness and historical persistence of its karstic landscape. The Polazzo hills are especially remarkable for their traditional use as grazing grounds. The local vegetation is dominated by shrubs—notably sumac—and some sessile oak and Turkish oak woods. In autumn, sumac develops typical shades of red that give the karstic landscape a special tinge. This is a plant of very ancient origin. Pliny the Elder refers to it in his Natural History, mentioning its employment in skin tanning and in the preparation of medicament. Its leaves were used to make red dye for cloth, its wood for yellow dye. It is a hard and compact wood with a yellow and green grain, used in the past for turning by ebonists, luthiers,

Fig. 11.1 The denuded landscape of the Carso is a unique feature of the Friuli region. Harsh battles were fought in the area during the First World War

and pipe makers. Sumac is exceptionally hardy. It only needs to sink its roots in a few centimeters of earth into the cracks of the rocks. It is also resistant to fire. In our area, shrubland alternates with vast spaces traditionally set aside for free-roaming grazing, which is propitiated by the area's high relative humidity. The Isonzo karst lay at the border between the Monfalcone area, placed under the rule of the Republic of Venice, and the County of Gorizia, a Habsburg hereditary dominion. All it had to offer was its lean grazing grounds. The difficulty in gathering fodder here and the consequent need for transhumance towards the Pivka plateau, in the Postumia hollow in the Slavonian Karst/Notranjska, resulted in a scarcity of bovines, whereas sheep were more abundant. In the late nineteenth century, there was a considerable increase of the flocks—of goats as well as sheep—and a concomitant cutting down of sessile oak woods, which the Austrian administration gradually replaced with black pine. To make the land more suitable to agricultural production, surface stones were cleared out of fields and used to make dry-stone walls delimiting cultivated plots. Some of these walls, once a ubiquitous feature of the local karstic landscape, are still visible today. The area was one of the main battlefields of the First World War, and a combat theater during the Second as well. In 1938 a memorial shrine was erected at Redipuglia, on the slopes of Mount Sei Busi at the southern limit of the area, to house the remains of over 100,000 soldiers who died here between 1915 and 1918.

The landscape appears to be essentially intact in its principal features, partly because it has not been impacted by urbanization. Some farms are rediscovering the raising of the *carsolino* goat and lamb, both autochthonous breeds along with bovines and donkeys. To improve pastures, over the last few years a rotation grazing system has been adopted for free-roaming animals: first goats, then donkeys, and finally, when the grass cover has emerged, sheep. These practices and the persistence of livestock grazing have helped to preserve the integrity and distinctiveness of the area. The institution of a Rural Park here is a commendable initiative that can contribute to safeguard the local historical rural landscape.

As regards vulnerability, the encroaching of the forest on vast areas formerly destined to grazing has already changed the landscape, and threatens to further undermine it. Once the transition from shrubland to forest is completed, the land may lose the typical denuded appearance of karst, since the local landscape owes its uniqueness not just to its geomorphology, which has limited the development of agriculture to a few areas, but also to the enduring of free-roaming grazing.

11.3 The Plasencis Countryside (46° 04′ 37″ N; 13° 03′ 53″ E)

The selected area comprises a portion of the Plasencis countryside characterized by tree rows bordering narrow, elongated fields that are a typical landscape feature of the Friulan plain. The area extends over about 300 ha, mainly privately owned, within the municipalities of Mereto di Tomba and San Vito di Fagagna. It is accessible by taking SS 464 from Udine to San Vito di Fagagna and then continuing southwest towards Trieste. Geomorphologically, the area is part of the upper Friulan plain; more specifically, of the district called "Medio Friuli", which lies at the foot of the morainic amphitheater, between the Torre torrent to the east and the Tagliamento river to the west. Its plain landscape is animated by the Corno torrent, which originates from the morainic amphitheater and forms shallow alluvial terraces in the plain. The soil of the area being thin and permeable, superficial water is scarce, in spite of high annual rainfall. The relatively thin fertile substratum, formed through oxidization, has low rainwater-retaining capabilities. Water scarcity is one of several factors that has affected the development of this strip of the plain (Figs. 11.2 and 11.3).

The area owes its significance to the persistence of a patchwork of closed fields delimited by hedges and rows of trees that is a characteristic feature of the historical landscape of the Friulan plain. Traces of human settlement in the area date all the way back to the third millennium B.C. They include a burial site and a fortified village. The toponym Mereto derives from Latin. It is a contracted form of "Melareto" or "Melereto", meaning a place where apples are grown. The addition of the specification "Tomba", officialized by a royal decree of 1931, refers to an ancient prehistoric tomb found here. The Ledra artificial canal, fed by the Tagliamento and Ledra rivers, runs through the municipal territory and branches out into the San Vito canal. It was built in 1881 but its use for irrigation only began in the 1930s. The local landscape has the appearance of a patchwork where spaces (known as *blave*) exclusively set aside for

Fig. 11.2 The countryside of Plasencis

intensive agriculture—which in Friuli is largely synonymous with maize-growing—alternate with areas that have retained their traditional features. Here, as in most of the plain, closed fields bordered with hedges and trees were a distinctive feature of the agricultural landscape. Unlike the rest of the municipal territory, the selected area has not yet been affected by the land reorganization undertaken since the late 1970s in the surrounding district to improve agricultural yields. This reorganization has involved the unification of previously fragmented property and the consequent removal of trenches, hedges and trees, regarded as obstacles to the increasing of cultivable surface and the mechanization of agriculture. This has indeed increased yields, but at the cost of collateral problems that have made a partial reforestation of the area necessary. The reorganization also involved the establishment of a rigid hierarchy between arable land, which has expanded over the last few decades, and pastures and meadows, which have contracted, partially as a consequence of a decline in the numbers of livestock. The hierarchy of cultivated spaces originally radiated out from the center of the village, from the private plots of peasant families near their homes to extensive farm and pastureland mostly belonging to large landowners. Hence the popularity of mixed rent, which for a long time was the prevalent type of contract between producers and landowners.

As regards integrity, the conservation of this area contrasts sharply with the decline of original features in the rest of the municipality. Here plots are still divided by rows of trees—pedunculate oak, ash, maple, locust, elderberry—also used to mark property boundaries. Plots are sometimes also delimited by rows of mulberry trees, introduced in the late 1700s with the massive spread of sericulture. Grapevine was

also common in treed vineyards, but today it is only grown at the fringes of settlements, in the so-called *braides/beàrz*, formerly enclosed or walled livestock shelters. These closed or half-closed fields are used as plough land and grazing meadows. They are a holdover of the formerly widespread natural meadows for the grazing of livestock, whose importance at the time surpassed that of cereal production. The gradual disappearance of meadows was indeed one of the most noticeable changes in the landscape of Friuli. In the Plasencis countryside there are still some communally owned meadows and pastures. These used to be widespread in the Friulan plain at least until the early 1700s. The Plasencis commons are presently under the authority of the local sub-municipality, but they used to be managed by councils of family heads called *vicinie*.

As regards vulnerability, one of the threats to the integrity of this landscape is that it may be reorganized like the rest of the territory of municipality, although along different lines. Involving the local population in actions to safeguard crop diversity and the organization of agricultural spaces may prevent actions that would undermine the identitarian relationship between the land and its inhabitants. Other risks could derive from further changes in farming methods resulting in the disappearance of what survives of the closed-field patchwork.

Land uses 2007	Surface (ha)	Surface (%)
Water body	6.4	0.33
Urban area and courtyard	77.8	3.95
Arboricolture	11.6	0.59
Shrubland	1.6	0.08
Mixed broad-leaved forest	55.3	2.81
Unproductive	8.5	0.43
Fruit orchard	2.6	0.13
Fallow	3.3	0.17
Vegetable garden	8.6	0.44
Arable land	1,786.4	90.75
Arable land with tree	1.0	0.05
Vineyard	5.4	0.28
Total	*1,968.5*	*100.00*

Evaluating indices of landscape	
Number of land uses	12
Number of patches	1,974
Total surface area (ha)	1,968.5
Average surface area of patches (ha)	0.99
Average surface area of arable land patches (ha)	1.00
Hedges density (m/ha)	68.84
Length of hedges (m)	124.396
Hill's diversity number	1.58
Class of landscape integrity (I–VI)	VI

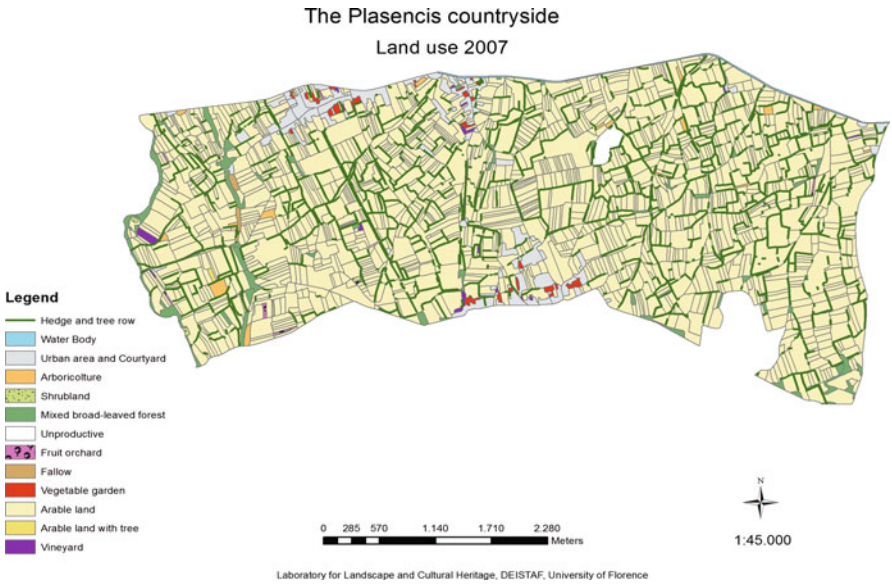

Fig. 11.3 The area of Plasencis presents tree rows bordering narrow, elongated fields, that are a typical landscape feature of the Friulan plain. The fragmentation of landscape mosaic is high and the average size of agricultural patches is small (1.00 ha) compared with the rest of the lowland areas of the region. The area shows a high degree of integrity, due to the conservation of traditional crops and to the network of hedges and rows (70 m/ha)

11.4 Rosazzo Abbey Hill (46° 00′ 31″ N; 13° 25′ 18″ E)

This hill is covered with a patchwork of woods, fields and vineyards extending over 500 ha. It stands at the east limits of the municipality of Manzano and in the western part of the municipality of Corno di Rosazzo, in the east-central Friulan plain. It can be reached from the road to Corno di Rosazzo, from Villa Trento, or from the road to Cividale del Friuli, exiting near Oleis. The hill rises to about a 100 m above the surrounding plain (itself about 100 m a.s.l.). On it are several scattered clusters of farmhouses, which together form the community of Rosazzo (*Rosàcis*, *Badîe*). The hill is formed of aeolian deposits, alluvial deposits arranged in terraces, and a Pleistocene travertine substratum (Fig. 11.4).

The area owes its significance to the presence of an abbey complex on top of one of the gentle hills that mark the transition from the Friulan plain to the Giulie Prealps, which in their turn decline towards the Gorizian Collio. Rosazzo was a Benedictine venue founded in the eleventh century, whose jurisdiction extended to the upper Isonzo valley. The Benedictine monks relinquished the abbey in 1423. It was taken over by the Augustinians, who contracted it out as a *commenda*. It became much coveted for the high profits it yielded to its *commendatores*, who were subject to the competing interests of the emperor—the territory of the Empire adjoined the plain near the course of the Natisone river—and the Republic of Venice. The patriarch of

Fig. 11.4 The historical landscape of the Rosazzo Abbey is characterized by vineyards

Aquileia and the archbishop of Udine, his successor, who until recently still held the title of Marquis of Rosazzo, used to spend the summer here, overseeing the peasants' work, which they depended on, in part, to supply their table. To demonstrate Rosazzo's long-standing record of excellence in wine production, the integrity of its landscape, and the economic significance of monastic communities even after the end of the Middle Ages, it is customary to cite a work entitled *Itinerario* by Marin Sanudo (1483), who tasted Rosazzo's "very perfect wines"; or the following verses by Francesco Berni (*Rime*, XXIV), an administrator of the abbey: "A path cuts through the church/Trod by people and animals" (*Per mezzo de la chiesa è una via,/ dove ne van le bestie e le persone*), and "Every room is a cellar/Bedroom, living room, breakfast room, and sick room/ But especially a natural stable" (*Ogni stanza è cantina/camera, sala, tinello e spedale/ma sopra tutto stalla naturale*).

Most of the hill's terraced slopes facing south are reserved to its landscape mosaic. The woods are composed of the most common hill species: lime-tree, manna ash, and field maple. Maize and wheat are grown in the fields, grapevine—especially *pignolo*, *picolit*, and *ribolla gialla*—on the hill slopes. The arrangement of the fields and vineyards in *ronchi* (*ròncs*) is a typical feature of the eastern Friulan and Slavonian Collio. After decades of abandonment, the abbey complex and the vast vineyards owned by the Archdiocese of Udine have been restored. From the terrace adjoining the main room of the abbey one can look out onto the plain, where the so called "Chair Triangle" lies. This is formed by the municipalities of Manzano, San Giovanni al Natisone and Corno di Rosazzo, and is one of the most important industrial districts in Friuli, with leading chair-producing companies. The landscape is thus

marked by a contrast between the plain, which was defaced by the strong industrial and residential expansion of the 1970s, and the hill area. Today the production of local wines has increased, thanks to very favorable soil and climate conditions. A conservative approach has been adopted to preserve the quality and distinctiveness of the final product. Recently the decision has been taken to reintroduce olive trees, of which only sporadic specimens survive, partially thanks to imports from Istria. Oil production is documented in the area at least as early as the 1700s, when olive-growing was ruined, here as in the Gorizian Collio, by the Little Ice Age. The local vineyards produce the DOC (Controlled Origin Denomination) wine "Colli Orientali del Friuli—Rosazzo".

As regards landscape integrity, increasing demand for quality wine has led to an expansion of the vineyards, but their growth in extension and number of plants has not been such as to become invasive. However, the concern to preserve landscape integrity is often seen as a hindrance to economic expansion. Other surviving original features include the association of grapevine and fruit trees (cherry, pear, and fig) in "orchard-vineyards". The fruit used to be sold on town markets, notably in Udine and Cividale.

Today the abbey houses a homonymous Foundation with a strong cultural vocation. Its patronage is essential for the conservation of the area's historical and agricultural heritage, which has known sudden spurts of growth alternating with periods of abandonment, before the recent restoration.

As regards vulnerability, the permanence of wine-growing and making farms, while on the one hand it ensures the preservation of the landscape, on the other, if intensified, could lead to the further expansion of monoculture. The present industrial crisis in the chair sector could pose a threat to the integrity of the hill's landscape. It may lead to its being abandoned anew, or, on the contrary, to overexploitation.

11.5 The Ampezzo Forest and the Lumiei Valley (46° 25′ 00″ N; 12° 42′ 50″ E)

The vast Ampezzo forest is mainly composed of fir and spruce, with some beech. It extends over about 3,000 ha along the right bank of the upper stretch of the Lumiei river. The forest is prevalently publicly owned and lies within the municipalities of Ampezzo, Sauris and Forni di Sotto. Altitudes range from 560 m a.s.l. at Ampezzo to 1,428 m a.s.l. at Passo Pura. The area is under landscape restrictions as per law n. 1497 of 1939 and law n. 431 of 1985. The town center of Ampezzo can be reached by driving by the road to Sauris, which goes up the Lumiei valley to the Buso Bridge and through a tunnel to the opposite side of the valley. One then goes through the dam on the Lumiei lake, skirting the south shore of the lake, and then up steep U-turns to the Tita Piaz shelter and the Pura Pass. As regards its geology, the area has sedimentary formations dating back to the Mesozoic, composed partly of rocks in the proper sense of the word, such as dolostone and dolomitic limestone, and partly of less compact formations, such as marl and clay.

This area in the Carnic Alps owes its significance to the historical persistence of its forest and to the beauty of its landscape, which also includes pastures and dense mountain-pine groves in the highest areas. The Carnia woods had been renowned ever since the Roman period for the quality of their coniferous wood, which was already a trade article back then. The area came under the control of Venice in 1420. In 1581 the Council of Ten placed its forest, as well as many others in Carnia, under exclusive rights of use for the Arsenal and other public uses. Venice had already applied such restrictions to many forests in Veneto and Istria, to safeguard a resource it regarded as essential both for its navy and for the growth of the city. After the Republic fell due to Napoleon in 1797, the end of state control led to a decline of all the forests in the Venetian dominions. In spite of this, the Ampezzo forest fared quite well. In 1874 it became the property of the Carnic Woods Consortium. From the Middle Ages to the early twentieth century, lumber was usually transported by floating it down watercourses in the spring. The felled logs were conveyed down the mountain slopes to the streams by means of wooden chutes called *risine*, made slippery by frost and snow during the winter. Where the Lumiei dam, erected in the 1930s, presently lies there was a *stua*, a wooden barrier forming a small artificial basin, which was opened to allow the force of the current to carry the logs downstream. Along with the historical vestiges of Venetian rule, the landscape's most durable features are a result of the local forms of resource ownership: municipal for woods and *malghe*, private for meadows and pastures. Communally owned vast areas provided the means of livelihood for individual communities or groups of villages. Besides the settlement cluster formed by the three villages of Ampezzo, Oltris and Volois along the state road leading to the Mauria Pass, there are small scattered settlements where the few surviving farms are. During the modern age, as pastureland slowly but continuously expanded, several groups of families settled in the area. This short range immigration—they came from the valleys of the Pordenone foothills and especially from the adjoining Cadore area—added to the importance of pastures in the local economy. Today several actions are in course to promote tourism in the area by revitalizing the local rural economy, which is gradually losing importance (Fig. 11.5).

The landscape's integrity is still essentially preserved. At different altitudes we still observe the area's traditional coexistence of grazing meadows (*prât*, *passòn*), woods (*bosc*) and high-altitude pastures (*mònt*, *màlga/Olbe*). In the Lumiei hollow are the villages of the municipality of Sauris, inhabited by German-speaking communities who established themselves in the valley in the 1200s. These villages still retain much of their original architectural and landscape qualities. In spite of the difficulties the agricultural sector is facing, and of the investment in the building of several forest tracks that have partially undermined the integrity of the landscape, thanks to the excellent quality of the local wood its cutting and commerce have endured over time. Today, a large part of the Ampezzo forest has obtained PEFC (Programme for Endorsement of Forest Certification schemes) certification for having been properly managed. Unfortunately, in spite of some references to cultural value in the criteria and indicators for Sustainable Forest Management—promoted by the Ministerial Conference on the Protection of Forests in Europe—certification criteria specifically aimed at the conservation of cultural-historical and landscape values are still lacking;

Fig. 11.5 Forested landscapes also owe their scenic beauty to the seasonal chromatic variability of the species they are composed of

a shortcoming that is seriously jeopardizing the conservation of important aspects of Italian and European historical forests.

As regards vulnerability, the main threats to the conservation of the area's traditional landscape features are posed by the crisis of the forest and livestock sectors, and population decline. The advancing of forests onto pastures as a result of drastic diminution of livestock, and the transformation of pure spruce forests into mixed stands are gradually altering the historical identity of the local landscape. The threatened building of a highway between Belluno and Carnia to connect the A27 and A23, which would graze this area, would compromise the valley bottom below the confluence of the Lumiei and the Tagliamento. As to the Lumiei torrent, its bed is almost always dry downstream of the Sauris lake dam, which replaced the old *stùa* to produce hydroelectric energy.

11.6 The *Magredi* of Vivaro (46° 05′ 47″ N; 12° 45′ 25″ E)

The *magredi* ("lean lands") of Vivaro form a dry and arid steppic landscape extending about 800 ha in the two municipalities of Vivaro and Maniago, between the Alpine and Prealpine area and the spring-rich Pordenone plain, both areas characterized by abundant water and rainfall. The Magredi di Vivaro have been included among the European Union's Sites of Community Importance (Magredi del Cellina SCI) and Special Protection Zones (Magredi di Pordenone SPZ) for the protection of avifauna. The area is reachable by the south stretch of the road going from Spilimbergo to Maniago through the high plain on the left side of the Tagliamento river, driving along the triangle formed by the torrent Colvera to the north and the confluence of the Meduna and Cellina torrents to the south. The *magredi* occupy the part of this area delimited by the torrents, on the right side of the Meduna and along the left bank of the Cellina. Going up the latter they join the so-called *magredo evoluto* ("evolved *magredo*") at Dandolo, in the commune of Maniago. The arid and gravelly soil of the *magredi*is the result of the Cellina and Meduna torrents' gradual erosion of the overlying mountains. When these torrents reach the foothill road, their impetuousness decreases and they wash rock fragments eroded into gravel and round and smooth stones onto the land on either side. The area's aridity is a result not only of the permeability of its soil, but also of its windiness, especially in the spring (Fig. 11.6).

The *magredi* landscape owes its significance to its uniqueness in the region, its historical persistence, and its special allure. The area is characterized by expanses of stone and grass, vast natural prairies, and sporadic shrubs and trees which gradually increase as one moves away from the *grave*, the broad riverbed. The result is an open area extending northward, where the Carnic Prealps grade into the western part of the upper Friulan plain. At the confluence of the torrents that formed this landscape, in the part of the area where humus is thick enough for cultivation, are the three historical local settlement units: Tesis (along the Colvera torrent shortly before its confluence with the Meduna), Basaldella, and Vivaro, presently all included in

Fig. 11.6 The landscape of Magredi di Vivaro shows evidence of agricultural settlements dating back to the Bronze Age

the municipality of Vivaro. Over the last few years archaeologists have discovered vestiges of many settlements dating back to the Bronze and Iron Ages, and the Paleo-Venetic, Celtic, and especially Roman periods, as well as some traces certainly dating from the Lombard age. The objects are kept at the Antiquarium of Tesis. These finds have shown that agriculture, livestock raising, crafts and commerce were practiced a lot more intensively than the present landscape would suggest. The *magredi* portion in Vivaro is defined as "primitive" for the sparseness of its shrubs. Where the shrubs reach more fertile terrain, they contribute to the formation of arid meadows. These, being unsuitable for cultivation, have essentially retained their original appearance. Degraveling and the piling of large rocks in mounds (locally known as *masaròns*) were among the strategies deployed by farmers to increase cultivable land. These actions, although necessary to counteract the aridity caused by the periodic exundation of the torrents, were carried out with "immense toil and expense", as the compilers of the Preliminary Acts for the Austrian Cadaster disconsolately observed. In these lands, as in all *magredi*, small and large animals grazed freely, with contradictory and controversial effects: on the one hand, they helped to fertilize the land, on the other, as they increased in numbers, they ravaged it. In the long history of the reclaiming and fertilization of the *magredi*, some stages especially significant stages stand out. A sizable portion of the land—which during the Venetian domination were the property of the Signoria, but were granted in use to the local communities—were purchased in the second half of the 1600s by noble Venetian families with capital to invest. Transhumant cattle from the north and the

west grazed in the *magredi*, as well as the local livestock. In the early 1930s, the Cellina Meduna Reclamation Consortium was founded. It built dams at the foot of the Prealps to help to control and channel the torrents. More recently, new production techniques have favored the expansion of agriculture, and especially of grain fields, fruit orchards, and vineyards.

As to their integrity, the local *magredi* still retain much of their original appearance. However, today the improving of the water supply—and thus the removing of one of the main hindrances to the area's agricultural development in history—has allowed the introduction of intensive cultivation, or simple tillage, at the expense of the natural meadows. This evolution has led to alteration of some portions of the traditional landscape.

As regards vulnerability, one of the risk factors for these areas is that until recently a large part of it was an off limits military zone. As the military gradually relinquish the area, formerly protected areas are threatened by the consequences of abandonment. Besides, the conservation of the area's environment, as required by its inclusion in two protected zones, appears an especially complex issue in this case, since conservation actions need to strike a balance with local socioeconomic activities.

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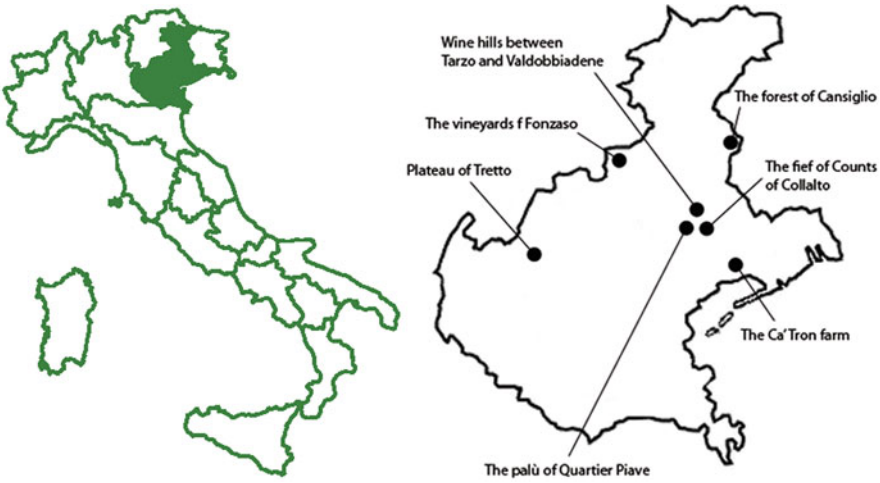
Chapter 12
Veneto

Tiziano Tempesta



12.1 Introduction

For centuries, the Veneto region was a land of farmers. Since its first appearance, around the year 3000 B.C., agriculture has gradually shaped the landscape of the region which has thus acquired a profound cultural significance. Generation after generation, the landscape increasingly expressed the inhabitant's experience of agriculture in a land with very peculiar climatic and geomorphological features. Indeed, among all Italian regions, Veneto is the one with the most varied and complex geomorphological and ecological characteristics. As noted by Prof. Lucio Susmel, in Veneto one finds all the main biomes of areas with temperate climates. In terms of

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altitude, the region varies from sea level to over 3,000 m a.s.l., in the case of many peaks of the Dolomite Alps. Between the Alps and the sea, lie the pre-Alps, in east-west direction. Inside the pre-Alps, one finds both mountain and high-hill land, a long series of low ridges typical of low-hills, and upper-plain terrain separated from low-plains by the resurgence area. The region has also other important peculiarities: a vast system of lagoons, one of the largest in Europe; the largest delta in Italy; the largest lake in Italy; the longest river in Italy; the longest resurgence river in Europe (the Sile). This complex and varied land, has been subject to constant human intervention aimed at improving the agro-silvo-pastoral economy, interventions which have had to adapt to the peculiar geomorphological and climatic characteristics of the region. As a consequence, the present landscape is also particularly varied. The territory is mainly cultivated land (37.5 %), followed by woods (24.3 %) and meadows and pastures (8.8 %). Simplifying, one can identify a number of phases in the agrarian and forestry development of the land, which has originated the present landscape.

- The paleo-Veneto period: gradual elimination of plain forests; construction of castles, fortresses and permanent settlements;
- Roman period: extension of cultivations to the entire region; centuriation of the majority of cultivable land;
- Early Middle-Ages: gradual renaturalization of the land caused by demographic decline; spread of marshes and woods;
- Late Middle-Ages: beginning of the reclamation; spread of irrigation; gradual extension of cultivations in the region; plowing of hill areas and hydraulic-agricultural work management of the hills (dry-stone walls, ridges); deforestation to create pastures; early diffusion of the 'Villa Veneta' type of holding, which becomes the center of a rebirth of agriculture;
- Modern age: continuation of the transformations of the Late Middle-Ages, with vast reclamations and creation of vast irrigated areas; spread of noble residences and of the Villa Veneta holding; spread in the entire plain of vineyards with mulberry trees used as support, which quickly becomes a distinctive feature of the plain landscape; interventions on rivers and regulation of the water system of vast plain areas. First passing of protective regulations for the woods used for shipbuilding by the Republic of Venice;
- Contemporary age: Introduction of machines for agriculture and hydraulic pumps that make possible extensive reclamations in the lagoon area: disappearance of plain woods and strong decrease of hill woods.

Starting from the period after WWII, a phase of drastic modification of the agriculture and landscape of the region has begun. On the one hand, the spread of mechanization has produced an extreme simplification of the rural landscape. On the other hand, the depopulation of the mountains and the crisis of mountain shepherding has favored the spread of uncultivated areas and woods. Finally, the extreme diffusion of scattered buildings tied to the development of regional economy, has caused a marked degradation of historical landscapes, making it difficult nowadays to recognize the rural landscape and its historical components.

For this reason, one of the first criteria adopted in the choice of historical landscapes to include in our catalog has been their present integrity, at least in reference to the main current transformations of the land. Secondly, we have tried, insofar as possible, to present landscapes originating from all the above-mentioned historical phases, choosing them from the various geographical areas present in the region. Finally, we have chosen areas characterized by a sufficient extension, in the belief that this is a necessary premise, at least in an initial phase, for any effective intervention aimed at culturally and scenically protecting and promoting these areas.

12.2 Plateau of Tretto (45° 46′ 01″ N; 11° 20′ 23″ E)

The plateau of Tretto extends for about 2,000 ha at altitudes varying between 400 and 900 m a.s.l. The area belongs to the municipality of Schio and for a very small part to that of Santorso, in the province of Vicenza, but up to 1969 it was an independent municipality called Tretto. The plateau is bordered to the north by mount Novegno, to the north-east by mount Summano and to the south-west by mount Enna. The area is exclusively private property. Part of it belongs to the SCI (Sites of Community Importance) and SPA (Special Protection Area) Monti Lessini-Pasubio-Piccole Dolomiti Vicentine, and is protected under the landscape law 431/85. The plateau can be reached from the center of Schio (via Lungo Gogna), from Santorso (via dei Tretti or provincial road SP 46) or from Torrebelvicino (via Villa Marini and then via San Giorgio). The entire area is characterized by the presence of plateaus of varying extension separated by small valleys arranged as a sort of horse-shoe facing towards the plain that extends from the localities of Marsili and Santa Caterina to the locality of Snorche di San Rocco. Geologically, the area is very varied. One finds dolomitic stone, gray limestone, sandy limestone, magmatic rises such as basalt and porphyrite, red, yellow, and purple sandstone, Conglomerate of Tretto and debris flow deposits. These characteristics determine a great variety in the vegetation, emphasized by the orientation of the slopes and by the altitude, and also influences human activity in the area. An example is that of the localities in which the original houses have the color of the soil on which they are built (white for limestone, red for sandstone, dark colors for basalt), but the geology affects also the cultivations, the way the fields are managed, the roads, and the management of the land in general (Fig. 12.1).

The significance of the area is due to the historical persistence of a particular landscape. The plateau is enclosed by high mountains, dotted with small groups of houses around which, for centuries, traditional cultivations have been carried out, while in other areas there are many woods and meadows, once used as pastures. The population of the area of Tretto began after 1000 A.D., apparently due to the immigration of German-speaking families from Bavaria or the nearby plateau of Asiago, called by the counts Maltraversi (Lords of Schio) to colonize their lands on

Fig. 12.1 The aerial photograph shows the woodlands surrounding and reducing the extension of cultivated land on the Tretto plateau

the mountains of Schio, to start new cultivations and especially to carry out mining activities. It is interesting to observe that the names of the localities, derived from local family names, begin to appear after 1290 in various documents and, as witnessed by a list of the participants in a 1511 meeting of the heads of family of Tretto, by then almost all the names of the present localities appear (a few others are added in similar meetings held in 1590 and 1635). In general, the present arrangement of small scattered settlements connected by a network of paths and mule tracks, often bordered by dry-stone walls, was established in the sixteenth century and has remained basically the same. The more than 70 settlements contribute significantly to the general aspect of the landscape. They have gradually expanded throughout the centuries adapting to the morphology of the land and following the contour lines. Each *contrada* or locality tended to be self-sufficient. As a result, they still have common spaces and services such as the central court, in which one finds a two-basin stone drinking-trough under a fountain, a cistern for gathering rainwater drunk by the poultry that are left free in the court, a chamber for producing cheese and butter called *casello ternario* and finally the *capitello.* An important element of local culture are the kaolin mines, once an important source of income that allowed residents to integrate the income of agro-silvo-pastoral activities. Traces of this activity are still present. Most are found near Contra' Pozzani (from 'pozzo,' Italian for 'well' or in this case 'mine shaft'), but in all the localities one finds the *casòni*, elevated platforms for exsiccating kaolin, which bear witness to the historical diffusion of mining activities in the Tretto area.

At higher altitudes, the wooded areas consist of coppice woods of beech and black hophornbeam, and in some cases spruces and larches as a result of reforestation. At lower altitudes, one finds the typical lower mountain woods: mostly black hophornbeams in combination with manna ashes and ashes, downy oaks, birches, chestnuts,

also maintained as coppice. There are also groups of beeches maintained as tall trees or as part tall trees and part coppice, of great forest and scenic importance. The presence of fruit-bearing chestnuts in a vast area between S. Ulderico and S. Rocco represents, along with the network formed by the various localities, an historical testimony of the colonization of the upper-hill area.

The territory has basically retained its integrity throughout the centuries and there are few cases of alterations caused by urban expansion, mostly located at lower altitudes. This is a result of the fact that municipal building regulations have forbidden new constructions outside the borders of the old settlements and required that new buildings conform to traditional architectural guidelines and the characteristics of the landscape. On the other hand, the area has suffered from intense depopulation, with peaks during the war period and the 1960s, in which there was no demand for housing. Many of the existing buildings still need to be restored.

The main vulnerability of the rural landscape of Tretto is the aging and gradual decrease of the population, now down to about 1,000 inhabitants. While this has limited new housing, it has also caused many of the existing houses to be abandoned. The land too has suffered from lack of maintenance, especially in steeper areas. Some cultivations have been completely abandoned and the areas have turned into meadows The risk is a gradual reduction of cultivations and open spaces and a re-colonization by shrubs first and then by the woods.

12.3 The Forest of Cansiglio (46° 03′ 35″ N; 12° 24′ 39″ E)

The woods of Cansiglio (Bosco del Cansiglio), extend for about 6,500 ha in the municipalities of Farra d'Alpago and Tambre (BL), Cordignano, Sarmede and Fregona (TV), Budoia, Caneva and Polcenigo (PN).

The altitude ranges from 900 to 1,500 m a.s.l., in the case of the higher ridges which enclose the plateau. The land is public property; 65 % belongs to the Veneto Region, 25 % to the Friuli-Venezia Giulia Region and 10 % to the Italian State. The area is therefore managed by two regional agencies and by the Italian Corpo Forestale dello Stato. In the area, one finds the protected areas Riserva Integrale di Piaie Longhe-Millifret, Riserva Naturale Campo di Mezzo-Pian Parrocchia, Riserva Naturale Pian di Landro Baldassarre, Riserva Naturale Bus della Genziana, and the SCI and SPA Foresta del Cansiglio. The area is protected under the landscape law 431/85. The woods of Cansiglio can be reached by taking provincial road SP 29 from the Friuli Region till Budoia and then taking via S. Tomè; in Veneto one can take toll-road A27 at Fadalto-Lago di S. Croce and then SP 423 till Farra d'Alpago. From here one goes towards the sub-municipality of Spert on SP 28 and then till Piano del Cansiglio on SP 422. Cansiglio is a vast plateau of the pre-Alpine area, enclosed by mountains reaching 1,300–1,500 m a.s.l. while the plateau itself has an altitude of about 1,000 m a.s.l. The soil is limestone, with marked karstic characteristics, which produce vast depressions, gorges, dolines and deep underground caves. The

Fig. 12.2 The beech forest of Cansiglio is one of the forests reserved for the use of the Venetian Shipyard for the production of oars for its galleys

geological substratum consists of red flaky marls and bituminous and saccharoid limestone (Fig. 12.2).

The area is particularly significant on account of the historical persistence of the beech wood used by the Republic of Venice for the oars of the galleys used in its military fleet and for the presence of an ancient and particularly varied and complex silvo-pastoral ecosystem. The first written document mentioning Cansiglio dates to 924 A.D., when Berengario I, King of Italy, assigned the fief of Cansiglio to the Bishop and Count of Belluno, who later granted rights of pasture to private citizens and to communities. With the development of the independent Italian towns (Comuni), the ownership of the 'Bosco dell'Alpago' went first to the 'Regole della Comunità dell'Alpago,' (Rules of the Community of Alpago) and then, in 1404, to the Republic of Venice, along with all the Community of Belluno. In 1548, the Republic of Venice chose the woods as its prime *bosco da remi* ('oar woods'), forbidding other uses, except for the pastures which remained assigned to private citizens and communities. The woods were entirely reserved to the Republic's shipbuilding department (Arsenale), which every year extracted thousands of beech poles, locally known as *stèle*, used for the oars of the galleys and the other boats of the Republic. Later, both European silver firs (*Abies alba*) and Norway spruce (*Picea abies*) began to be used. Though much less common than beeches, these trees were present both in the mixed woods and in the doline spruce woods that surrounded the central pastures. These trees were used for masts, lateen yards, yards and other parts of the ships that began gradually replacing the galleys in Venice towards the end of the seventeenth century. In the last years of the Republic of Venice, there was a failed effort to completely substitute fir-trees for beeches, which were non longer considered of public utility. In the nineteenth century, and even more in the twentieth century, beech woods were extended on account of a growing demand for beech timber for a variety of products:

firewood for the glassworks of Murano, charcoal for the copper mines of Agordo, railway ties. The big centennial trees, instead, were used by the Cimbri, a Germanic population from the plateau of Asiago, who had settled in the forest, to produce *talzi,*small boards used for boxes, sieves and other things, which were also exported abroad. Since the second half of the nineteenth century, Adolf von Bérenger, an Austrian forest inspector and the first director of the Istituto Forestale of Vallombrosa (Florence), tried to use the entire area as a laboratory for his theories on forestry, but was unable to carry out the investigations. The first forest management plan was applied only in 1930. Each step of this evolution has left more or less significant traces behind, which are being studied and illustrated in various ways, though the greatest significance of the area from an historical perspective remains the presence of the beech woods once used by the shipyards of the Republic of Venice. The woods of Cansiglio abund in mammals and birds, including capercaillies (*Teatro urogallus*) and probably lynxes, once extinct.

The area continues to retain its integrity, especially in regards to the beech woods, although the maintenance in the last 20 years has followed naturalistic criteria aiming at their transformation into mixed woods. To document human presence in the area, a Museum of Man in Cansiglio is being set up, with sections on prehistory and on the Venetian period, on the colonization by the Cimbri, the first permanent inhabitants of the wood, and on the technical characteristics of their handicrafts. Pastures, a key feature of the landscape, are maintained thanks to a number of farms dedicated to sedentary herding and to the seasonal activity based on the use of a number of shepherd's huts. A small dairy uses the milk to produce organically certified cheese.

As far as the vulnerability of the area is concerned, the main problems of the Bosco del Cansiglio derive from the lack of a unitary administration and by the uncertainty on the future of the area. A number of different proposals have been made: natural park, regional or interregional reserve, inclusion in the National Park of Dolomiti bellunesi or the Regional Park of Dolomiti friulane. The Italian Corpo forestale dello Stato has created an ecological museum, which includes collections of fossils and animals of Cansiglio and the surrounding areas, whereas the flora is documented by an Alpine Botanical Garden (Giardino botanico alpino) managed by Veneto Agricoltura, in which there is also a Center for natural education. Environmental associations fear the negative consequences of the connection of Cansiglio to the ski slopes of Piancavallo, in Friuli, which local administrator are insistently trying to obtain, with the support of the Region, in order to stimulate tourism.

12.4 Wine Hills between Tarzo and Valdobbiadene (45° 54′ 34″ N; 12° 06′ 58″ E)

The most ancient and specialized wine area in Veneto is located in the municipalities of Tarzo, Refrontolo, Cison di Valmarino, Follina, Pieve di Soligo, Miane, Farra di Soligo, Vidor, and Valdobbiadene, in the province of Treviso. It extends for

about 4,000 ha. The land is private property and protected under the landscape law 1497/39 and 431/85. The altitude ranges between 130 and 350 m a.s.l. It can be easily reached by taking the state and provincial roads in the northern part of the province of Treviso. Coming from toll-road A24 one can exit at Conegliano and once past the town continue on provincial road SP 635 towards Tarzo. Near the locality of Corbanese, it is possible to take one of the roads that go south-west along the ridge on which the vineyards are located. Geologically, the more level part of the area is characterized by white friable Dolomitic stone, while on the higher areas one finds limestone interbedded with clay. The vineyards are located on the southern slopes of a series of three hills very close to one another and oriented east-west on the northern border of the plain of Treviso.

The area is particularly significant due to the historical persistence of a specialized viticulture dating to the period in which viticulture was still not cultivated intensively. In the past, specialized vineyards where common only in certain hill areas of Veneto, and the most renown since antiquity was precisely the area between Tarzo and Valdobbiadene. The southern, eastern, and western slopes of the area are nowadays characterized by intensively cultivated vineyards, while the ones facing north are mostly occupied by woods. The slopes are generally rather steep and this has made it necessary to adopt a number of peculiar hydraulic-agricultural systems to cultivate the land. Only in the period after WWII, in Veneto, as in the rest of Italy, specialized vineyards become common, both in the hills and in the valleys. As shown by the Austrian land register of the early nineteenth century, there were few areas at the time in which specialized viticulture was present. Some surviving pole vineyards dating to the second half of the eighteenth century are indication of what was once the typical aspect of the land. Vineyards, due to the steepness of the terrain, were cultivated in small terraces with 'girapoggio' ditches and occupied almost all the slopes. In general, the cultivation system was the classic Sylvoz, though other systems are also present especially in the area of Valdobbiadene: modified Sylvoz, 'a cappuccina' system, and modified Guyot. Nowadays, most of the posts for the vineyards are made of cement, though one still finds rather frequently vineyards with wooden posts or trees used as posts. In the holdings one still finds the typical '*casere*' or tool sheds. Other important historical monuments include churches and the ruins of ancient castles. The wines of the area are very high quality and include the Prosecco di Conegliano and Valdobbiadene DOCG (Controlled and Guaranteed Origin Denomination), the Prosecco di Valdobbiadene superiore di Cartizze DOC (Controlled Origin Denomination) and the Colli di Conegliano-Refrontolo DOC (Fig. 12.3).

The landscape has mostly retained its historical integrity, at least as far as vineyards are concerned. The three hills are separated by two narrow valleys, characterized by a mostly rough terrain. While there has been some damage to the landscape, in general the difficult nature of the terrain has helped preserve the traditional landscape. Also, the extremely high price of the Prosecco and the Cartizze has encouraged farmers to continue viticulture even where the steepness of the terrain makes it difficult to use modern technologies. At the same time, the roughness of the terrain has prevented the development of industries and limited the construction of private residences.

Fig. 12.3 The terraced hills of Valdobbiadene are one of the best preserved historical landscapes in the Veneto region. Renowned wines are produced in the area

Notwithstanding the above, there remain a number of threats, albeit circumscribed, against historical viticulture. More specifically, there are three main vulnerabilities. First, a number of slopes have been excavated and modified to set up vast vineyards more suitable to mechanical agriculture. In more impervious areas, some vineyards have been abandoned, perhaps also due to competition from more modern vineyards. Finally, the architecture of both new private buildings and buildings used for wine-making has largely ignored historical criteria. Wineries have often been build in the form of industrial buildings with a marked negative impact on the quality of the landscape. Also, in the nearby valley, many actual industries have been established. Pastures located at the summit of the hills have been gradually abandoned and as a consequence recolonized by woods.

12.5 The Fief of the Counts of Collalto (45° 51′ 02″ N; 12° 14′ 05″ E)

The area in question is an agricultural area belonging to a farm of the Counts of Collalto. It has an extension of 1,500 ha and is located in the municipality of Susegana, in the province of Treviso on the left bank of the Piave river. The land belongs to the farm. Its altitude varies between 100 and 200 m a.s.l. and the land is partly protected under the law 431/85. The farm can be reached by going north on

state road SS 13 di Alemagna and, once past the town of Susegana, by taking Via 24 Maggio at the roundabout, going to the end of the road, and turning left on Via San Salvatore, which leads to the homonymous castle, for centuries the center of the fief.

Geologically, the area consists of alluvial terraces originated in the last glaciation, with a substratum of conglomerates and clay of lacustrine origin. The flat part of the area is located between the hills of San Salvatore and Tombola and the river Piave, while the more elevated one includes approximately all the hills at the back, up to the castle of Collalto and the hill of Col de Guarda.

The significance of the area is tied to the historical persistence of the castle of San Salvatore and the surrounding cultivations, which together constitute the most interesting aspect of the landscape. The history of the farm begins around the year 1000, when the founder of the Collalto line, Ramboldo I, obtained from Berengarius II, King of Italy, the town of Lovadina, on the right bank of the river Piave, which served as a defense to the city of Treviso. After having become counts of Treviso, because of tensions with the Bishop of Treviso, the Collalto family decided to move to the left bank of the Piave. Around the year 1100, Ensedisius I built a castle on the hill of Collalto, and the family took the name of the place. In 1245, the counts obtained from the "podestà" of Treviso also the neighboring hill of San Salvatore, on which stood an ancient church. Here, the counts began to build a new castle, the castle of San Salvatore, which still overlooks this part of the upper plain of Treviso. Inside the castle, count Rambold VIII built a majestic palace, surrounded by houses for the members of the family and of the court. During the Renaissance, the castle became a center of arts and letters and was visited by Pietro Aretino, Paolo Bembo, Agostino Beazzano, Francesco da Varago, Gerolamo Bolognini. Around the castles of Collalto and San Salvatore agriculture flourished (Fig. 12.4).

At the beginning of the nineteenth century, the fief had an agricultural surface of 3,800 ha of which 37 % was fruit-trees and vines, 20 % meadow, 8.3 % pasture and 28 % woods. Towards the mid-nineteenth century, the fief passed into the hands of the Moravian branch of the family. A cousin of the family named Alfonso inherited all the properties of the Veneto region and sent his son Octavius to administrate them. This young and enterprising count took a deep interest in the property and managed it with passion throughout his life, turning San Salvatore into an active and industrious farm. New farming techniques were experimented and at the foot of the hill an innovative winery was established, with cellars, offices, houses, and *barchesse*, i.e. traditional Venetian arcaded structures used for housing machines and horses. At the outbreak of WWI, because the counts were of Austrian nationality, the entire holding was expropriated by the Italian government and returned to the family only in the mid-1920s. The frontline ran practically through the property, which was the site of one of the worst battles of the Piave front. The castles of San Salvatore and of Collalto were destroyed, as well as the sharecroppers' houses and many buildings used for wine and silk making. Nevertheless, by 1929 the farm was again operative and had a surface of more than 4,100 ha and a workforce of 3,808 people, including tenant farmers, sharecroppers and farmhands. About 270 rural houses were rebuilt.

Fig. 12.4 The architecture of the vineyard around the castle of San Salvatore shows an aesthetic quality that enhances the architectural beauty of the building

Most of them are still standing and are recognizable by their typical yellow color with two red bands. Recently, the rebuilding of the castle of San Salvatore has also ended.

The integrity of the area, besides the castle and the rural buildings, is also dependent on the agrarian use of the land. Nowadays, the surface of the holding is considerably smaller, amounting to 1,500 ha of which 600 are level and the rest are hilly. The flat area is entirely used for crops, while in the hilly area there are about 135 ha of vineyards, 200 ha of pasture and meadows, and 550 ha of woods. The winery at the foot of the Castle is still based on the structure of the original building built in 1905 when, for practical reasons, it was decided that the wine-making be no longer done inside the castle. From an historical perspective, besides the integrity of the entire hilly part of the holding, which has basically maintained its traditional layout, an interesting element is the presence of pastures, which are among the few surviving pastures in the lower hills of the Veneto region. The part of the holding that includes the Castle of San Salvatore is particularly well-preserved.

The vulnerability of the area is tied to the presence of a few modern buildings that have somewhat altered the traditional aspect of the farm. However, this phenomenon is marginal. Isolated new constructions are mostly limited to the more level area of the holding, and especially to the borders of the property. The two castles are still well-integrated in the surroundings and are of great historical value. Another vulnerability is the abandoning of meadows and pastures, which has allowed the

woods to expand, negatively modifying the historical landscape. The phenomenon is in many ways unavoidable, also in the light of the current legislation. The maintaining of the integrity of the holding is the fundamental precondition for the preservation of the original layout. It is also essential that the various communes exercise due vigilance over construction work in the area.

12.6 The Palù of Quartier Piave (45° 52′ 34″ N; 12° 06′ 20″ E)

The Palù del Quartier del Piave area extends for about 900 ha in the municipalities of Moriago della Battaglia, Sernaglia della Battaglia, Vidor, and Farra di Soligo in the province of Treviso. The land is private property and located at altitudes between 110 and 150 m a.s.l. The area includes the SCI Palù del Quartier del Piave, and the zones less than 300 m from rivers are protected under the landscape law 431/85. The area can be reached by taking provincial road SP 34 which runs through Moriago and Sernaglia, from which one takes Via Busche (also known as via dei Palù or SP 123), which runs through the area in the direction of Farra di Soligo. The area of Palù is located on clayey alluvial soil. Most of the water that comes down from the hills near the area is absorbed at the bottom of the hills by the gravelly bed of the torrents, and re-emerges in the lower central part of the area, forming a network of springs that creates marshes or areas characterized by a great quantity of underground water.

The significance of the area is tied to the presence of an historical landscape created by reclamation work carried out many centuries ago, consisting in a series of small meadows bordered by hedges and a network of small draining canals. Around 1100, the monks of the nearby Abbey of Vidor, began draining the land in order to make the marshy land cultivatable. Though there are not documents attesting the precise origin of the present landscape, it seems likely that it is the result of the original reclamation carried out by the monks. Certainly, by the time the first land register of the Republic of Venice was produced, towards the end of the seventeenth century, the territory already had its present configuration. Also in French and Austrian military maps of the nineteenth century, the general characteristics of the area are the same of the 1960s. The distinctive scenic element of the Palù area is the presence of a system of fields bordered by a thick network of ditches. A system of locks along the ditches was used both for raising fish and to irrigate the fields. Only some of the holdings are geometric in shape. It is the case of those resulting from reclamations carried out at the time of the free Italian Comuni or under the dominion of the Republic of Venice. The irregularity of the other holdings could be a result both of geomorphological conditions and of reclamation work done without any central coordination. This leads to the hypothesis that, after the initial work of the monks, many areas were reclaimed by individual owners which, in various historical periods, modified the holdings according to their needs and possibilities. The study of

Fig. 12.5 A view of the agrarian landscape of Palù

nineteenth-century military maps also shows a number of transformations in the use of the land.

The integrity of the land is high only in small sections of the original historical landscape. The inclusion of this area in our catalog aims therefore at protecting the residual elements of what was once a much vaster landscape. In 1890, the fields cultivated as meadows bordered by hedges were 89 % of the land, while another 6 % consisted of enclosed crop fields. In 1982, the meadows were down to 55 %, whereas the enclosed crop fields were 20 % and the ordinary crop fields 19 %. However, after the PTRC (the territorial plan of the Veneto Region) stated the need to protect the area, the local population has become aware of its historical and cultural importance and has taken measures to protect it. Environmental associations offer guided tours of the area, which has also been included in the Natura 2000 network allowing more active protection measures to be taken (Figs. 12.5, 12.6).

Until a few years ago, the integrity of the area had been damaged by urban and industrial expansion, and by the construction of scattered modern style rural houses and animal farms of industrial character. Fortunately, however, in the nineteenth and twentieth century there were no drastic reclamations and this limited constructions outside the borders of the settlements. The greatest present problem is the abandoning of traditional agriculture, and in particular the abandoning of animal farming which in turn causes the abandoning of cultivations and the degradation of the historical landscape. The abandoning of cultivations and of animal farming has also led to the formation of small woods which alter the traditional landscape.

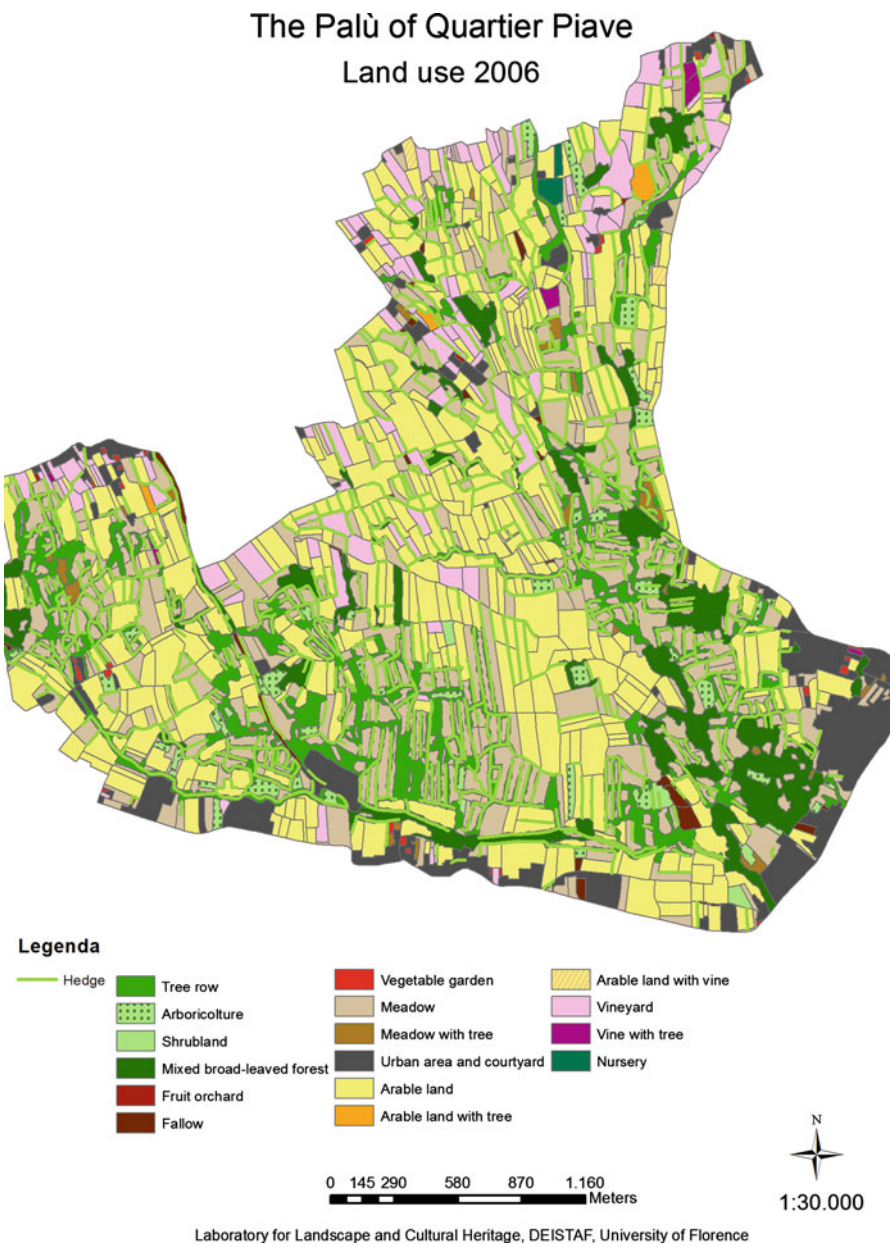

Fig. 12.6 The historic landscape of the Palù is characterized by meadows, arable land and small vineyards, divided by hedges and trees, according to a pattern of parallel narrow plots of land. The area surveyed shows 36 % of arable land, 23 % of meadows and 7 % of vineyards, while the linear trees and hedges are found on 14 % of the surface. Tree rows and hedges account for a total of 80,000 linear meters. The historical landscape appears quite intact, as in most of the areas surveyed the major threats are abandonment and intensification

Land use 2006	Surface (ha)	Surface (%)
Hedge and tree rows	122.30	14.10
Arboricolture	17.74	2.05
Shrubland	3.37	0.39
Mixed broad-leaved forest	68.58	7.91
Fruit orchard	0.33	0.04
Fallow	6.04	0.70
Vegetable garden	2.05	0.24
Meadow	199.89	23.05
Meadow with tree	6.13	0.71
Urban area and courtyard	62.81	7.24
Arable land	311.56	35.93
Arable land with tree	2.66	0.31
Arable land with vine	1.31	0.15
Vineyard	58.37	6.73
Vine with tree	2.40	0.28
Nursery	1.70	0.20
Total	*867.25*	*100*

Evaluating indices of landscape	
Number of land uses	16
Number of patches	1,475
Total surface area (ha)	867.25
Total surface area (ha)	0.59
Average surface area of patches (ha)	0.46
Average surface area of forest patches (ha)	2.70
Total length of hedges	8,0315
Average length of hedges	116
density of hedges (m/ha of crops)	131.90
Hill's diversity number	6.04
Class of landscape integrity (I–VI)	V

12.7 The Ca' Tron Farm (45° 35′ 51″ N; 12° 26′ 06″ E)

The Ca' Tron farm has an extension of about 1,100 ha and is located in the sub-municipality of Ca' Tron, in the municipality of Roncade, in the province of Treviso, with the exception of a small portion (87 ha) in the neighboring municipality of Meolo, in the province of Venice. The holding is private property and is located on flat terrain with altitudes ranging between −0.5 and 1.5 m a.s.l. It is bordered to the north-west by the Venezia-Trieste railway, to the east by the Vallio river and the Fossetta reclamation canal, and to the south by the Sile river. The area is partly included in the Regional Natural Park of Fiume Sile and the SCI Fiume Sile da Treviso est a San Michele Vecchio, and is also protected under the landscape law 431/85. Ca' Tron can be reached from the town center of Roncade, following Via Pantiera for 5.5 km turning left on Via Boschi and after another 1.3 km turning again left on Via Meolo, which takes to the entrance of the holding. Geologically, the substratum of the area consists of alluvial and coastal deposits, originated in the Holocene epoch, and the terrain is entirely level. The soil of the holding is medium textured and clayey.

The area is significant as an example of an historical holding situated on reclaimed land, in which human presence dates back to the Roman period. Though the entire land was probably inhabited and cultivated already in the Roman period, as indicated by the presence of the Via Annia, after the fall of the Roman empire the fragile system of waterworks broke down and the land became gradually swamped. This led to depopulation and an abandoning of agriculture, which lasted till the fourteenth century, when the land was acquired first by the Collalto family and then by the Tron family. Only after the eighteenth century, did the reclamation of the land begin. Initially, the land reclaimed from the swamps, because of the abundance of water, was used for rice paddies and pastures. At the time, there was also a sizable extension of surviving plain woods, which however was cut down during WWI. In the nineteenth century, after the fall of the Republic of Venice, the farm was sold many times, until Giovanni Corte bought it and gave it its present configuration around the mid-nineteenth century. This led to a unitary organization of the holding which, notwithstanding changes in ownership, was finally carried out with another complete reclamation in the 1930s and 1940s. The Società Anonima per la Bonifica dei Terreni Ferraresi (Anonymous Society for the Reclamation of the Land of Ferrara) gave an essential contribution. The entire holding was subdivided into land lots assigned to sharecroppers. The land was managed according to the Ferrara system and this made possible the planting of crops in the entire holding. Since 2000, the area is managed by the Fondazione Cassamarca, a foundation dedicated to promoting economic and social development, which has started various activities aimed at promoting the area, including the historical and cultural promotion of the holding. Presently there are 500 ha of soybaen, 100 ha of corn, 100 ha of wheat and alfalfa, 70 ha of vineyard, 25 ha of woods and 90 ha of crops. The new 30 ha vineyard planted in 2002, is an experimental vineyard, which employs various types of vine and is available for study purposes to research institutes and other bodies. Among the various agricultural activities, of particular interest is the farming of a local varieties of geese (25 heads), ducks and chicken, and the production of "Bianco Perla" corn for quality polenta. The latter is on the list of the Slow Food association and is also listed by the Italian Ministry of Agriculture as Traditional Food Product. Many abandoned rural houses are being restored. In the holding there is also an abundant wildlife which includes hares and especially birds (pheasants, herons, little egrets, ducks, buzzards, falconets) totaling more than 150 species. In the holding there is also a hunting reserve.

As for the integrity of the area, the distance from major roads and the presence of the Sile river to the south has kept in check the demand for residential and industrial buildings of the nearby town of Quarto d'Altino. As a result, there has not been the process of urbanization which has characterized other areas with similar historical and scenic characteristics. Of course, the cultivations have undergone profound modifications and the part of the landscape that retains its integrity is mostly the structural and infrastructural components of the holding, which have maintained the characteristics acquired in the 1930s. The order followed by the various phases of the reclamation is still clearly discernable. Starting from the two main roads, via Nuova and via Pioveva, set at right angles, the various subholdings assigned to each sharecropper were created. Along the main and secondary roads run the ditches and canals that drain the water towards the Fossetta canal and the 1930s water-scooping

Fig. 12.7 The central buildings of the Ca' Tron farm are the elements showing the highest degree of persistence and integrity

machine that propels the water into the Sile river. All holdings are of the same shape and size and each has a rural house. The rural buildings are of particular interest due to their architectural characteristics and their position. The buildings that date to the first phase of the reclamation (end of the eighteenth century), but also those modified at the beginning of the twentieth century, often maintain the original structure and provide a clear idea of how a great sharecropping holding was structured.

Actually, there do not seem to be particular threats to the land, since, as mentioned above, its position and distance from major roads prevents the spread of urbanization. The only negative element is the few houses recently built near the church of Ca' Tron: it is however a limited phenomenon that does not have a significant impact on the scenery. An other element that helps protect the area is the fact that the southern part of the holding is located inside the Sile Regional Park. The only foreseeable problems could come from the subdividing of the property and the end of the agricultural activity of the holding, which could encourage the construction of scattered rural buildings (Fig. 12.7).

12.8 The Vineyards of Fonzaso (45° 59′ 55″ N; 11° 47′ 09″ E)

The vineyard area is located in the municipalities of Fonzaso and Arsiè, in the province of Belluno, and extends for about 500 ha at altitudes varying between 200 and 600 m a.s.l., though the surface of the historical vineyards is less. The land is

private property, and partially protected under the landscape law 431/85. The area can be reached from Feltre by taking state road SS 50 towards Fiera di Primiero, or from the Valsugana valley, by taking state road SS 47 first and then SS 50bis, going over the hills of Primolano, and through Arsié. The geological substratum of the area consists of densely stratified white limestone, with a presence of marl and clay. At all altitudes the soil is medium textured and mixed with small quantities of sand. Fonzaso is positioned at the mouth of a narrow gorge of the Cismon torrent in a secluded valley with two exits. The larger exit faces Feltre and was anciently the bed of the Cismon torrent towards the Piave river, which followed the deep structural fracture of the Valsugana fault from the great glacier of Val Belluna. The other exit faces towards Cismon del Grappa and the Valsugana valley, and corresponds to the present course of the Cismon, in the direction of the deep gorge created by the Brenta river. To the south, the valley is enclosed by the northern slopes of mount Grappa, while beyond the gorge of the Cismon torrent are the plateau of Col di Lan, the Cima di Campo mountain, the ridge of Arina and the plateau of Lamon. To the north, overlooking the valley, are the plateaus of Faller and of Sovramonte.

The significance of the area is tied to the persistence of historical viticolture, often based on traditional vines, in small plots, both on terraced slopes and in the valley bottom, where there are rows of vines scattered in meadows and pastures. The origin of the settlement is unclear, but it probably dates to the Roman period, when the nearby Feltre was a 'Municipium' and it was through the territory of Fonzaso that the Roman road Via Paolina, a branch of the Via Claudia Augusta Altinate, ran. When Feltre passed under the control of the Republic of Venice, in 1404, Fonzaso too became a Venetian dominion. The presence of an important wine production and of a renown agrarian landscape in the Medieval period, was also a result of Fonzaso being positioned along an important timber route, which began in the valley of Primiero from which for centuries tree trunks had been floated down the Cismon and then down the Brenta river until Venice. The present structure and architecture of Fonzaso bear witness to its commercial past. The river was used not only to transport timber, but also to power several factories, including numerous 'Venetian' saw-mills, which were particularly successful for the benefit of local timber merchants. For local wine, there were two main commercial routes: one went towards the Primiero valley, an area of woods and mines, and from there towards the Alpine valleys; the other went towards Primolano and the entrance to the Valsugana valley towards both Bassano and Trento. The wine was sold also in the German-speaking areas in which the wines of Veneto and Trentino were held in high esteem. Besides the work done on the slopes throughout the centuries, another important historical factor is the preservation of local vine types, which have recently been rediscovered, such as the *bianchetta gentile, cirnesera, grassella, rossarda, pavana, grinta, clinton*. Another characteristic element is the variety of vineyard types. There include vineyards in which vines are supported by wooden posts, by trees (locally named *altaii*), pergolas, and vineyards based on the *galdon* system. Thus, on the one hand the area was characterized by a high level of specialization, but on the other there was a great variety in both vineyard systems and vine varieties (Fig. 12.8).

Fig. 12.8 The terraced vineyards of Fonzaso are small patches of a landscape that is disappearing due to abandonment and the advance of trees

The integrity of the historical landscape has been greatly reduced in the period after WWII, and nowadays only a few slopes, such as those in the localities of Frassenè or Soras still have the original vineyards. The reason has been the emigration and abandoning of agriculture which began at the end of the nineteenth century. This problem was compounded by the spread of phylloxera and other pathologies that attacked the vineyards.

The present vulnerability of the area is associated with the abandoning of the cultivations which has continued also in recent years. One of the consequences is the advance of the woods which gradually destroys the ancient terraces. Market reasons have also led to the adoption of 'universal' vines (merlot, cabernet, prosecco) that need different treatments and vineyard types from the local vines. A strong effort is being made to increase the awareness of this problem to avoid the definitive loss of this heritage. Finally, another problem has been in recent years the significant spread of industrial and artisanal buildings in the area at the bottom of the valley.

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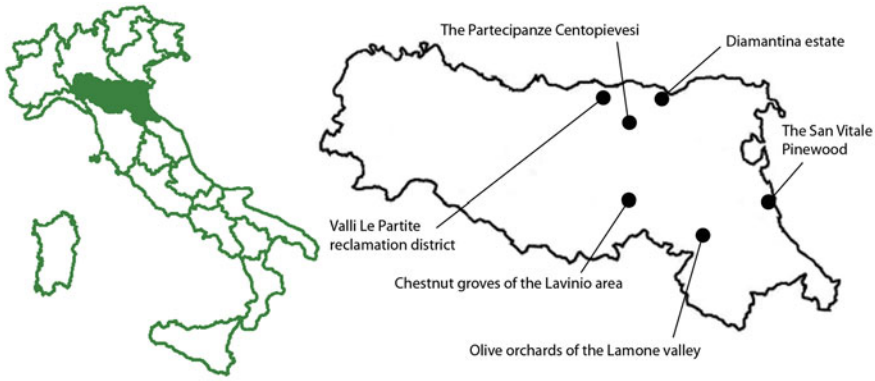
Chapter 13
Emilia Romagna

Franco Cazzola



13.1 Introduction

Emilia Romagna is one of the Italian regions where agriculture reached high levels of productive efficiency and has kept them up to this day. Farmland still accounts for a significant portion of the region's total land area (50 %). Woodland and pastures (respectively 27.5 and 0.5 %) mainly occupy the Apennine mountain range. Industrialization and specialization of the agricultural sector in the last century, however, has deeply transformed the rural landscape. The plain countryside of Emilia and Romagna used to elicit much admiration from foreign travelers for the perfect geometric pattern of its fields alternating with rows of trees and grapevine, which made them look like a vast garden arranged around solid houses of bricks and tiles. Today,

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however, that landscape only survives in the memory of the elderly. The geometry of the fields is still there, especially in the recently reclaimed lower plain, but the physical characteristics that used to distinguish the lower plain from the high and middle plain zones extending on either side of the Via Emilia from Rimini to Piacenza are irremediably lost. Herbaceous monocultures now extend over all land left free of construction. Pits, paths, tree groves, hemp retting-pits, even threshing floors, all have been converted into arable land. Farm animals live in large closed sheds resembling the small factory buildings that have sprung up everywhere. Part of the hill and mountain landscape is being transformed by the gradual encroaching of trees and shrubs onto abandoned fields. Another part is cultivated by mechanical means that rarely take account of the difficult orography of the Apennines and the risk of erosion. Should we bemoan the loss of this world and the immense human effort that shaped it? Certainly not. Emilia Romagna is nevertheless a region blessed with an agriculture with record yields and quality. However, it is the historian's task to seek the weight of the past in present landscapes, not only because earlier landscapes were more harmonic and aesthetically pleasing, but also because they sometimes reflected a more rational use of land and its ecosystems. Since today the plain is dominated by annual herbaceous crops (wheat, maize, sorghum, rice, beet, soy, potatoes, etc.) or specialized fruit orchards, the search for landscape elements worthy of attention should begin from features that are more persistent over time such as farm tracks, drainage works, and buildings. Thus, our decision to mostly pick out areas in the grain-growing lower plain should not seem out of place, although farming there today is highly mechanized and industrialized. It is in the plain that we find the few truly rural areas in the region, although they lie next to the now prevailing urban, industrial and tertiary landscapes. One such area is the vast Diamantina estate, only a short distance from the town of Ferrara. It is the result of a reclamation and reorganization of the agricultural space that began in the late fifteenth century and was carried on between 1510 and 1520 by Lucrezia Borgia, Duchess of Ferrara, who financed the digging of a large drainage channel known as the Canal Bianco. Another remarkable historical landscape lies in the area of the Centopievese commons. Here a land redistribution system has survived down to this day, whereby land is parceled out every 10 years among male descendants of an original group of holders of collective emphyteutic leases. This periodic land redistribution has informed the layout of this area, which is covered with so many small plots of identical size separated by tracks. Hemp was grown intensively here for centuries. A third low-plain landscape is found between Modena and Mirandola. It lies in a marshy district, the Valli di Burana, where horses were raised for centuries. Action has been taken recently to restore this area's environment and landscape, as well as two of its large horse stables, the *barchessoni*. We have included in our selection of agro-forestal areas the vast San Vitale Pinewoods, which today is included in the Po Delta Regional Park and placed under landscape restrictions. These woods, originally planted with *Pinus pinea* by the Roman to provide lumber for shipbuilding, have survived through the centuries and expanded seawards, thanks to their systematic exploitation and pine-nut harvesting by the abbey of San Vitale in Ravenna. Today, however, maintenance for economic

purposes has come to an end and the pinewoods run the risk of turning into mixed woods; a situation that shows the inadequacy of the several forms of protection the area is placed under as far as the preservation of its historical characteristics is concerned. For the reasons mentioned at the beginning, the issue of hill and mountain areas is more complicated. Here, abandonment and depopulation seem to produce apparently less serious consequences than in the plain, but pose some problems of definition. We have selected a mountain-ridge area still occupied by chestnut groves in the valley of the Lavino river, a testimony of the historical importance of chestnuts in the landscape and economy of the Apennines. While chestnuts are still grown here today, the area is under the constant threat of abandonment, with the consequent loss of the historical characteristics of the woods, which require constant maintenance.

13.2 Chestnut Groves of the Lavino Area (44° 23′ 43″ N; 11° 10′ 47″ E)

The area includes the chestnut orchards between the rivers Reno and Lavino. It is one of the most important chestnut areas of the province of Bologna, both for its size and scenic value. It extends for about 300 ha, mostly privately owned, and is located in the municipalities of Monte San Pietro and Sasso Marconi. It can be reached from Bologna by taking either the Lavino valley road in the direction of Tolè or the ancient ridge road "Varsellane," which goes from the locality of Montepastore to that of Mongardino. The area is located on the right bank of the mid- and upper-valley of the torrent Lavino, extending on its north-western slopes and the top of the ridge that separates the Lavino valley from the Reno valley. Its altitude generally varies between 350 and 650 m a.s.l., with a maximum of 750 m a.s.l. The geomorphology of the slopes is complex, with gullies (*calanchi*) at lower altitudes, and a substratum of limestone and marl-sandstone. The terrain is moderately steep with 15–35 % grades.

The significance of the area is tied to the historical persistence of the traditional chestnut cultivation system of the Bologna area. This cultivation was established and regulated with edicts and prescriptions already in the twelfth century. But the Lavino valley was already known to Latin authors, as witnessed also by traces of the Roman centuriation. In the eighteenth century, the chestnuts of Montepastore and Monte Severo were already renown, as attested, and they were described in the geographical dictionary of the mountains and hills of Bologna written by Serafino Calindri in 1782. This is one of the production areas of the typical Bolognese "blond" chestnut and specifically of the cultivar "marrone di Montepastore," one of the choicest chestnuts of the Tuscan-Emilian Apennine. Two sections within this larger area are particularly noteworthy. The first is that of the chestnuts that seamlessly extend from the slopes of Monte Vignola, east of the town of Montepastore, to the northern slopes of Monte Tramonto, near the church of Monte Severo and

further on to the locality of Borra, occupying a total surface of 80 ha. In this area there are century-old trees, with monumental characteristics both for the thickness of the trunks and the extension of the foliage. The second particularly interesting area is the one occupying the north-western slopes of Monte Bonsara. The notable extension of the chestnut orchards is crucial for the quality of the scenery of the mid- and upper-valley of Lavino, as one can observe when traveling on the road at the bottom of the Lavino Valley, from the locality of Padova di Ronca towards Montepastore, or on the ridge road that goes from Montepastore to Medelana. The chestnuts are part of a larger scenic context characterized at lower altitudes by small crop-fields and meadows, a few vineyards and by fruit orchards, with a significant production of typical Vignola cherries and corn. At higher altitudes, we increasingly find, along with chestnut orchards, coppices of downy oaks, black hophornbeams, and pastures.

As for the integrity of the area, in contrast with the general decline of chestnut cultivation in Italy after World War II, in the area of Montepastore the presence of chestnuts and the production of the local cultivar has continued to the present day. This is a key factor, given that the growing interest for this production in many Italian regions involves the reintroduction of traditional cultivation practices and the rediscovery of local cultivars. The chestnut orchards have mostly the appearance of cultivated orchards, in which traditional methods are still followed. Trees are positioned at a distance of 7–10 m from one another, mainly grafted with the "marrone" variety and regularly pruned. The roads and the paths are well-maintained and the undergrowth is regularly mowed. The litter of the chestnuts is gathered and burned in the woods, while dead trees are replaced with new ones. In some properties, sheep still graze in the woods, serving the dual function of cleaning up the undergrowth and fertilizing the ground, but also that of preserving the historical aspect of chestnut orchards, almost always subject to other activities aimed at keeping the ground clean to help the gathering of the chestnuts, also through temporary cultivations.

As for the vulnerability of the area, it is likely that chestnut cultivation will go on as long as the owners of the orchards of Montepastore continue to live there and are able to bear the costs of maintaining the surfaces and the trees. Other potential threats come from the common practice of eliminating centennial trees, without taking into consideration their beauty or monumentality, which can be present despite bad health and low productivity. The health of chestnut trees, in fact, is not always optimal. While the danger of the disease known as "chestnut cancer" has significantly declined, the health and productivity of the trees is nowadays threatened by two specific threats: the first is the disease nicknamed *mal dell'inchiostro* or "ink disease" and the second is the parasite called "Chinese chestnut wasp" (*Dryocosmus kuriphilus*). A decline in productivity due to these two maladies could make the financial burden of maintaining the chestnuts of the Lavino valley excessive and cause them to be further abandoned (Fig. 13.1).

Fig. 13.1 The chestnut orchards of medio Lavino are a residual portion of the historical landscape of the Apennines

13.3 Valli Le Partite Reclamation District (44° 55′ 08″ N; 11° 03′ 25″ E)

This area is an important example of a landscape created by land reclamation works. Its most remarkable features are a historical canal system and some traditional buildings used for horse raising. The area extends over about 600 ha within the municipality of Mirandola (MO). It is publicly owned but leased out to cooperatives. The Vailli le Partite district can be reached from Modena by driving north on SS 12, or from the A22 by exiting at Villanova and continuing eastward to Novi di Modena and, from there, taking the SP 28 to Mirandola.

The soil of the Ferrara and southern Modena provinces is alluvial in origin, with a limey and peaty matrix, especially along the ridges formed by the paleo-beds of the Reno, Panaro and Secchia (Gavello) rivers. Numerous alluvial sedimentations in the Bondeno area have generated clay, lime-clay, or peat soils giving instability problems along the banks of canals, and subsidence problems on reclaimed surfaces.

The Valli Le Partite area owes its significance to its being a historical testimony of the ongoing struggle between man and water to free up areas for agriculture; a struggle that has produced a still visible system of canals and banks, as well as buildings and other hydraulic works that have remained a distinctive feature of the local landscape down to the present day. The land reclamation works were carried

out in the Middle Ages, when the decision was taken to reclaim areas that would have otherwise remained covered with water almost the year round. Just as along the coast of Romagna the landscape was dominated by lagoons and many saltwater basins, this area of the lower Po River plain was dotted with water expanses that made it unsuitable for farming. The purpose of the several land reclamations carried out here was to regulate the flow of water from higher land and drain away water in the lower zones by means of canals and embankments called *serragli*. The works that most significantly modified the Mirandola valleys area were carried out between the eighteenth and the twentieth century. This renovation of the agrarian landscape reduced the importance of other activities connected to the area's previous environmental characteristics. Notably, the reclamation modified terrains where local noble families had bred horses for centuries. As early as the 1400s, the Pico family was raising and pasturing prestigious horse breeds on the vast plains and swamps extending between Gavello and San Martino in Spino, in that stretch of land that marks the boundary between the provinces of Modena, Mantua and Ferrara. Later on, when the Menafoglio family acquired this area, horse breeding remained one of its chief activities. Some unusual buildings with a polygonal plan called *barchessoni* were built in the first half of the nineteenth century to shelter the horses and the workers who took care of them. The *barchessoni* are one of the most distinctive building types in the area. Today, the crops grown in the district prevalently include cereals and fodder, mostly exported to the neighboring provinces of Mantua and Modena. Some smaller areas are set aside for orchards of fruit-trees, especially pear, and other trees.

As regards its integrity, although the present farming system is highly mechanized and hence very different from the historical one, the Valli district still retains some important features of its traditional landscape. Vestiges of the original canal system can still be recognized all over the area, and several traditional buildings still survive, partly thanks to restoration work undertaken by the Commune of Mirandola over the last few years. Of the seven surviving nineteenth-century *barchessoni*, only two are accessible to visitors, viz., the Barchessone Vecchio and Barchessone Barbiere. The Barchessone Vecchio is the larger of the two and has a more unusual structure, distributed onto two stories. The Barchessone Barbiere, instead, although it has a similar polygonal plan, is single-storied. Horse breeding began to decline after the end of World War II, to disappear almost completely during the 1950s, partly due to the expansion of mechanized transportation and the constant need to increase the cultivated surface; the *barchessoni*, however, are still there as testimonies of its former importance. Environmental recovery projects initiated in the 1990s have recreated part of the natural and semi-natural humid environments that for centuries characterized the Po River plain.

As regards vulnerability, as in almost all the Po River plain, the expansion of residential and industrial building threatens to obliterate this landscape, which has maintained some of its distinctive features over time. Further modifications in the local agricultural setup and infrastructure may compromise the persistence of the canal network and other still visible land reclamation works (Fig. 13.2).

Fig. 13.2 One of the seven nineteenth-century Barchessoni. They were used as stables for horses and are still a distinctive landscape feature

13.4 Olive Orchards of the Lamone Valley (44° 12′ 40″ N; 11° 44′ 27″ E)

The area presents an agro-forestal mosaic with traditional olive orchards located in the municipality of Brisighella in the province of Ravenna. The lands is mostly privately own and extends for about 800 ha, at altitudes between 100 and 280 m a.s.l. The more significant areas are found in the localities of Castellina and Fognano, which can be reached from Brisighella by going south-west on SS 302, alongside the Lamone torrent. The area is protected by landscape regulations, specified by acts 1497/39 and 431/85. Part of it is within the territory of the Carnè Natural Park. The area is characterized by a complex geology, with a substratum of little competent and erodible rocks, consisting mainly of sandy marls, (with) grated sandstone and silt with quartz and feldspar. The area is for a small part included in the *Vena del Gesso Romagnolo* ("Gypsum Vein of Romagna") an outcrop of cliffs where gypsy strata has remained bare while between one stratum and the other, termophilic and xerophilous vegetation has grown. It is a unique environment, formed by a karstic complex in the form of a long rocky ridge of selenite, with many caves that lend themselves to speleological explorations and characteristic karstic structures, which contribute to the distinctive aspect of the local landscape.

The significance of the landscape revolves mostly on the historical presence of traditional olive groves located on the slopes of the hills situated on the left-bank of the Lamone torrent, along with ample areas with vineyards and fruit-orchards, mostly located on the right-bank of the torrent. The medieval town of Brisighella is the most

Fig. 13.3 The olive orchards of the Lamone valley. In the background one can see the castle of Brisighella

important center in the valley. Olive orchards are particularly noteworthy in this area, whose rural vocation is documented today in a Museum of Farming, hosted in a sixteenth-century fortress positioned at the top of a rocky cliff overlooking the town. The area is one of the of most interesting olive areas of northern Italy, as witnessed by the existence of references to "Brisighello" olive oil dating to the fifteenth century. The small local production is of very high quality and the oil was the first oil in Italy to receive, in 1996, a PDO label: "Brisighella." The Lamone Valley is rather extensive, bordering with the region of Tuscany to the west, but it is naturally protected by colder winds and enjoys a milder and wet climate, which is ideal for various types of crops including olives. Notwithstanding the dramatic demographic decline that occurred after WWII, as in all the Apennines, olives are still cultivated and have a significant value from both a scenic and cultural perspective. From the perspective of land usage, the hills of the valley can be divided into four macro areas: crops, meadows, fruit-orchards, especially kiwi, and vineyards/olive orchards. The Lamone Valley, like the parallel valley of the Senio river, is one of the most significant areas of the Tosco-Romagnolo Apennines from a natural perspective.

As for its integrity, the landscape has not been yet subject to an excessive intensification of olive farming. The orchards are of variable density and alternate with crops and vineyards that form unusual tapestries of woods and farmland on the slopes of pleasant hills. The hills are characterized by gullies that contrast with the cliffs emerging from the Gypsum Vein that crosses transversally the valley, forming a typically karstic landscape. The protection and further development of olive farming should be carried out in such a way as to ensure also the protection of the scenery, in order to bolster the image of the local olive oil PDO and the projects of territorial marketing that have been carried out in recent years.

From the perspective of the vulnerability, the proximity of the Padana plain and the strong development of housing have already partially compromised some of the scenic elements of the valley, transforming part of the agricultural areas into semi-urban areas. By studying land usage maps one can observe the decline in cultivated areas due to the formation of new gullies, besides the extension of urbanized areas. Another vulnerability is the strong need for water for the various competent and erodible rocks crops, especially for the intensive cultivations of kiwi, which are particularly demanding in terms of water. These risk factors combine with the tendency to create olive orchards with excessive density, which negatively impact the quality of the scenery and its role as additional value to the land (Fig. 13.3).

13.5 The Partecipanze Centopievesi (44° 45′ 35″ N; 11° 16′ 02″ E)

The *partecipanze* landscape is one of rural settlements and parceled fields on reclaimed land where one of the last shared ownership systems in Italy still survives. It is preserved in six areas in the provinces of Modena, Bologna and Ferrara. Of these, those of Cento and Pieve di Cento, with an extension of about 2,550 ha, are the largest and historically most significant. Although the two communities, which lie at either side of the border between the provinces of Bologna (Pieve di Cento) and Ferrara (Cento), have been divided for centuries, we chose to regard them as one. This because for a long time in their history they formed a single society. Besides, the two areas' landscape features are so similar that it would be difficult or even impossible to treat them separately. Access is by SP 66 from Ferrara or SP 255 from Modena, which go through both Cento and Pieve di Cento. Geologically the area in question is formed of alluvial deposits of the Po delta.

The landscape owes its significance to the historical persistence of elements such as the parceling of fields, rural settlements of medieval origin, and forms of common ownership, which make the Partecipanze a living testimony of the historical landscape of the lower Po River Plain. Following norms that have remained unchanged down to this day, lots are drawn periodically to sort out the collectively owned land among legitimate male descendants of old local families, who are the only ones to have title to it. The system dates back to the early thirteenth century. It is the result of the granting of a series of emphyteutic leases of vast areas, partly marshy and partly wooded, by the Bishop of Bologna to the two communities, who back then formed a single

administrative unit. The scarcity of cultivable land in the area induced the local people to draw up a land reclaiming and rationalization plan involving a division into plots called *morelli*, a name they are still known by today, delimited by long access tracks (*cavedagne*) placed at equal intervals of slightly more than 190 m. The fact that these tracks still follow one another continuously over the whole area of the Centopieve Malaffitto is evidence that this land organization system is earlier than the separation between Cento and Pieve di Cento, which dates back to 1376. From a normative and juridical point of view, the system has remained largely unchanged since 1484, when the bishop of Bologna Giuliano della Rovere (the future pope Julius II) restored the twenty-year interval redistribution system of the Partecipanze. In 1894, the system was granted official juridical status under the Kingdom of Italy. The only change was carried out in 1939, when the decision was taken to unify the Casumaro and Malaffito plots to try to cut expenses and increase the size of the lot.

As regards integrity, some of the principal features of the Partecipanze Agrarie have remained unchanged over the centuries, and still have an important role in the local farming economy and society. The Partecipanze are one of the last surviving forms of cooperation and solidarity between farming communities. In spite of a constant increase of large estates owned by private companies, the system has managed to live on, keeping alive a peasant culture which would otherwise have disappeared. There have been changes in the crops grown in the area; notably, a transition from the growing of hemp to increasingly specialized and intensive industrial monocultures,

Land use 2008	Surface (ha)	Surface (%)
Water body	5.85	0.57
Urban area and courtyard	268.60	26.07
Arboricolture	3.24	0.31
Recretional area	3.24	0.31
Fruit orchard	131.27	12.74
Fallow	7.18	0.70
Vegetable garden	1.69	0.16
Arable land	590.76	57.33
Arable land with tree	3.25	0.32
Greenhouse	2.62	0.25
Vineyard	7.46	0.72
Vines with tree	2.69	0.26
Vines with fruit orchard	1.12	0.11
Nursery	1.51	0.15
Total	*1,030.49*	*100.00*

Evaluating indices of landscape	
Number of land uses	14
Number of patches	1,366
Total surface area (ha)	1,030.49
Average surface area of patches (ha)	0.75
Average surface area of arable land patches (ha)	0.79
Hill's diversity number	3.14
Class of landscape integrity (I–VI)	N.C.

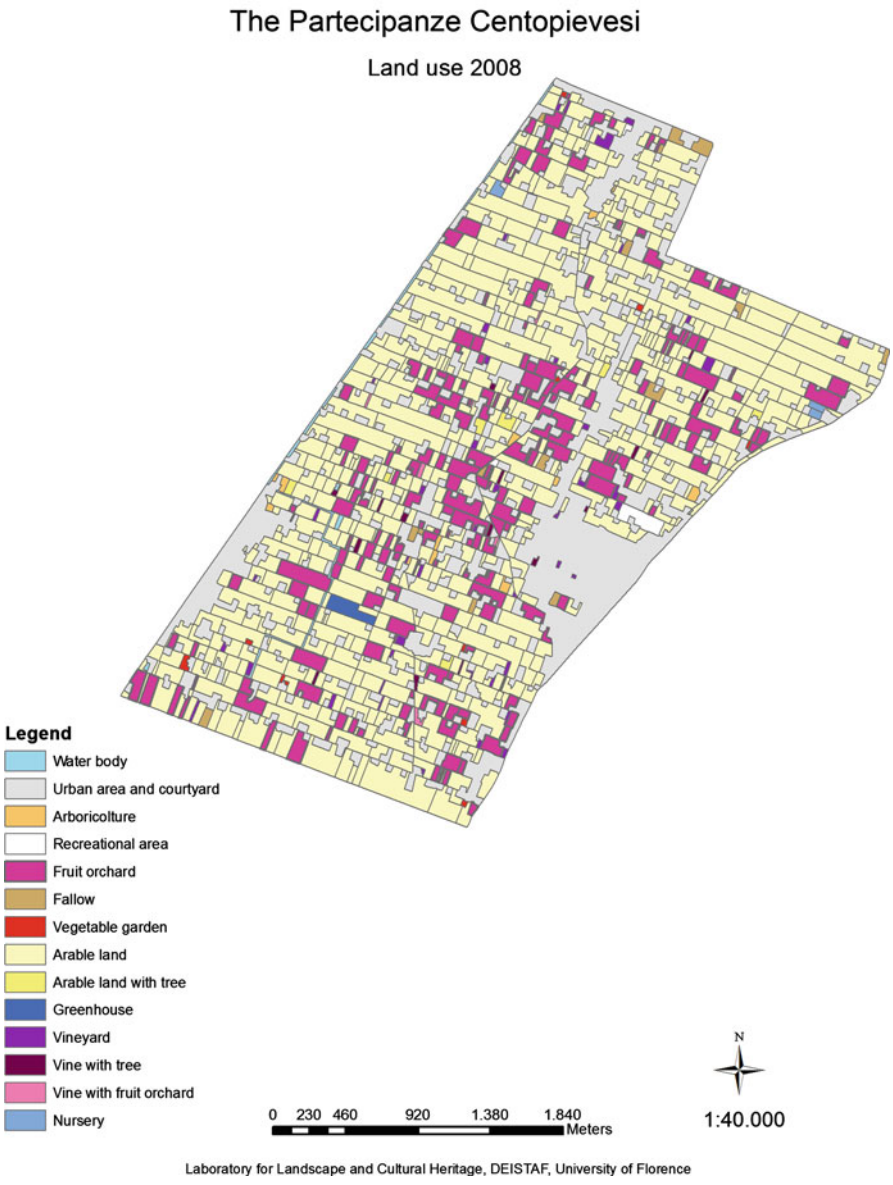

Fig. 13.4 The landscape of Partecipanze Centopievesi shows a very regular field subdivision, a result of lands reclamation works that began as early as the Middle Ages… The only surviving historical feature is this regularity of the land mosaic, since today 57 % of the area is covered with industrial cereal monocultures and 26 % with urbanization. The area owes its vulnerability to the expansion of large industrial complexes, which is transforming the whole area into a continuous periurban landscape

exploiting the land to the maximum of its potential. The settlement and plot grid nevertheless still endures as a testimony of cultural, historical and social integrity and a thorough documentation of centuries of history.

One of the vulnerabilities of the area is its exposure to the expansion of large industrial complexes, which is transforming the whole area into a continuous peri-urban landscape. Another is the possibility of further changes in crops that could lead to further blotting out of the *morelli* and *cavedagne*, whose regular arrangement on the ground is a distinctive feature of the area's historical landscape (Fig. 13.4).

13.6 The San Vitale Pinewoods (44° 29′ 44″ N; 12° 13′ 47″ E)

The area in question is a still extant portion of the old Ravenna pinewoods, extending over about 1,000 ha near the town of Ravenna along the coast of Romagna. The San Vitale Pinewoods lie within the perimeter of the Po Delta Park, a Site of Community Importance, and the "Pineta di San Vitale e Bassa del Pirottolo" Special Protection Area. Besides, the woods are placed under their own specific landscape restrictions. The Pineta is accessed by many paths, all roughly perpendicular to the Strada Statale Romea. Guided itineraries are available at several points. Geologically, the area belongs to a vaster extension of the Po River Plain composed of Holocenic Quaternary alluvial sediments deposited by the river Po, as well as earlier coastal sand. A succession of levees in the pinewoods are a testimony of sedimentation at the mouth of the Po at Primaro.

The area owes its significance to the historical persistency of the umbrella pine woods through many centuries; although their original structure has been altered in many ways, presenting an emblematic case of the difficult relationship between historical forest landscapes and protected areas. Our pinewoods comprise the northernmost and vaster surviving portion of the ancient pinewoods of Ravenna, which date all the way back to the Roman Imperial period, when they were planted to provide lumber for shipbuilding. After the fall of the Western Roman Empire, Justinian gave the woods to the Archbishop Agnello. This event marked the beginning of a long-lasting monastic control of all the coastal pinewoods. During this period, the woods reached their maximum extension, ca. 6,000–7,000 ha—today it remains only one third—divided between the pinewoods of San Vitale, Classe and Cervia. The monks had total control of the woods, although they granted local populations the right to graze and cut firewood in them, as well as hunt and fish. The coastal pinewoods near Ravenna were well known in the Middle Ages. They are mentioned in the works of medieval poets such as Dante and Boccaccio. Following the suppression of religious orders by the French in 1797, the Ravenna pinewoods began to undergo major changes. The monastic estates were transferred to private individuals who quickly converted vast portions of the pinewoods into cropland. Gaps thus started to appear in what had been a continuously wooded strip going from the Reno River all the way to Cervia. George Byron describes the woods during his sojourn in Ravenna, where he stopped coming from Venice in 1819. Ravenna was one of the stops of the "Grand Tour", a long journey through Europe undertaken by aristocrats

Fig. 13.5 The historical umbrella pine forest of Ravenna, dating back to Roman times, runs the risk of turning into a mixed wood due to the lack of proper management

and intellectuals, especially from England, between the seventeenth and nineteenth centuries, with Italy as their principal destination. Between the late nineteenth and early twentieth century, a long debate began on the destiny to be reserved to the Ravenna woods. One of the main promoters of this debate was Member of Parliament Luigi Rava, who had realized the environmental and cultural importance of the area, as well as its purely economic one, based on the production and commerce of pine nuts. Besides the gatherers, who worked from October until early spring, there were workers in charge of opening the pinecones, while it was women's task to strike them until the seeds came out. The whole community's days were cadenced by their work in the pinewoods, which lasted the year round. In the early twentieth century, a completely different view began to emerge of the consideration in which this corner of Romagna should be held. A new notion was taking hold, namely, that it is not just buildings and works of art that should be regarded as national heritage, but also entities defined as "natural"; although these, too, were the result of human action, as in the case of our pinewoods. It is thanks to this change in attitude that the S. Vitale pinewoods managed to survive. The need was felt to plan new pinewoods here to replace those mentioned by great poets, but maintaining all of the original woods' historical landscape features. The S. Vitale pinewoods thus became an indispensable resource for a country striving to single out elements of its historical heritage to underpin its national identity (Fig. 13.5).

The integrity of the area shows some contradictory aspects. The Italian umbrella pine (*Pinus pinea*), with its characteristic umbrella-shaped foliage that leaves ample space underneath it, and thus favors tourist fruition, has been joined by other species,

such as pedunculate oak, poplar, ash, and holm oak, as well as dense undergrowth that often hinders transit. Thus, the "pinewoods" are increasingly taking on the character of a mixed wood. Thus, while the woods still retain some of their principal characteristics, their integrity is compromised as regards their specific composition due to the lack of management policies aimed at conserving their historical features. This is a particularly significant issue, especially considering that the area is under a great number of landscape and environmental restrictions. These have evidently managed to preserve the woods, but not to conserve its monospecific structure, clearly because they do not take adequate account of the historical features of this landscape.

For all these reasons, the pinewoods' main vulnerability is not the encroaching upon it of industrial or tourist sites—although these are growing continuously in adjacent areas—but rather the progressive transformation of the woods into a semi-natural area, with the consequent loss of their historical characteristics. Thus, the S. Vitale Pinewoods' inclusion in the Po Delta Park, and in Sites of Community Importance, in application of the HABITAT European Directive, does not appear to be an effective measure for the safeguarding of this historical landscape, unless action is taken to remove species other than the Italian stone pine, and adequate silvicultural management models are implemented (Fig. 13.6).

Land use 2008	Surface (ha)	Surface (%)
Water body	372.08	18.97
Urban area and courtyard	10.95	0.56
Arboricolture	2.10	0.11
Shrubland and cane thicket	68.64	3.50
Wetland	258.18	13.16
Willow and poplar forest	94.20	4.80
Mixed broad-leaved forest	35.76	1.82
Mixed Italian stone and maritime pine forest with broadleaved	303.00	15.45
Mixed forest with prevalence of Italian stone pine	326.49	16.64
Unproductive	0.84	0.04
Fallow	43.63	2.22
Italian stone pine forest	288.50	14.71
Meadow	84.01	4.28
Afforestation with pine, hornbeam and ash	66.42	3.39
Arable land	0.25	0.01
Arable land with tree	0.29	0.01
Road system	6.33	0.32
Total	*1961.69*	*100*

Evaluating indices of landscape	
Number of land uses	17
Number of patches	355
Total surface area (ha)	1961.69
Average surface area of patches (ha)	5.53
Average surface area of forest patches (ha)	7.13
Hill's diversity number	8.86
Class of landscape integrity (I–VI)	III

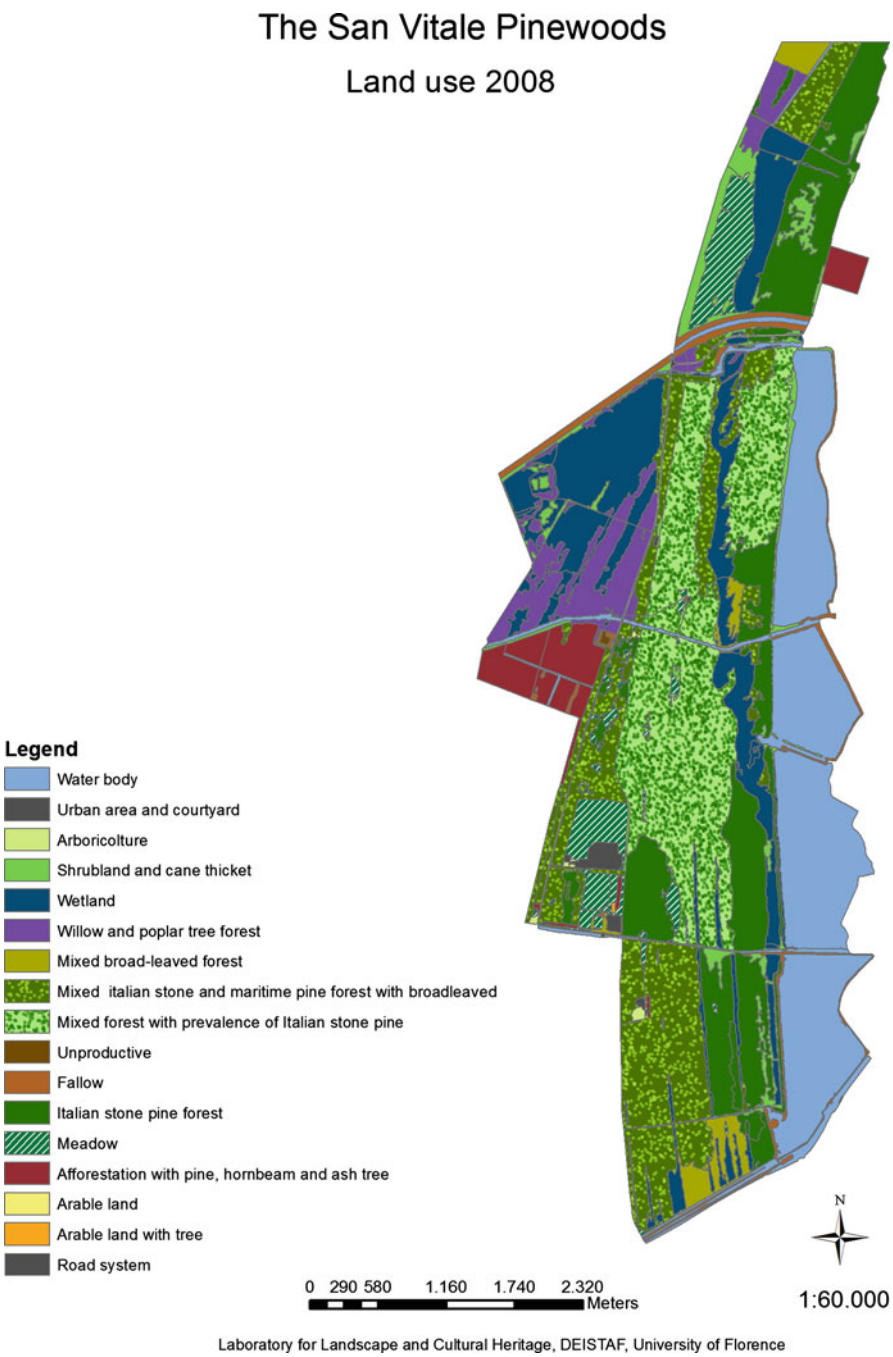

Fig. 13.6 The area of Pineta di San Vitale is characterized by a historical landscape of umbrella pine trees, originally planted for production purposes. The pure pine forest is now present only on 14.7 % of the area, due to the absence of any form of management affecting the renaturalization slowly turning this forest into a mixed stand, despite the presence of four different forms of protections at European (NATURA 2000) and national level. The Pineta di San Vitale is one of the best example of the ineffectiveness of the current landscape restrictions and nature conservation strategies, unsuited to preserve historical landscapes

13.7 Diamantina Estate (44° 53′ 09″ N; 11° 30′ 38″ E)

In the countryside around Vigarano Pieve (Municipality of Vigarano Mainarda), a few kilometers west of the town of Ferrara, among ploughed fields and modern specialized fruit orchards, is a group of rural buildings known as the "Diamantina" after a homonymous locality in the old Polesine of Casaglia, deriving its name from one of the emblems of the House of Este, the diamond. Driving along the Virgilian road (SS 496) one reaches the access point to the estate, a long driveway that leads right to the manor house, restored today to its original appearance. Geologically, the area lies in the alluvial plain of the Po River.

The Diamantina owes its significance to the preservation of its historical rural settlement, which dates back to the late 1400s, when the estate covers 1,600 ha. The earliest information about the appearance of a new farming center in the area dates from 1478, when 13 families and 126 individuals were reported to have established themselves on the spot. The area still retains the typical characteristics of reclaimed land modified by man over the centuries by digging canals to second the natural drainage process. The vast interfluvial depression of the Ferrara Polesine, where the Diamantina lies, was exploited communally for fishing and reed gathering by the men of the village of Settepolesini. In 1506 the villagers gave it to Ercole, son of Sigismondo Este and brother of the Duke of Ferrara, in return for exemption from the yearly 60-lire head tax (*boccatico*). While it was Ercole himself who initiated the digging of drainage canals, it is Lucrezia Borgia, wife of Alfonso I d'Este, who successfully carried out the first reclamation of the area, in response to a growing demand for new fertile land to cultivate wheat for a continuously increasing population. Before Lucrezia's reclamation, malaria, humidity and the lack of drinkable water made living conditions in the area almost too harsh for settlement, but this did not discourage the inhabitants of the area from striving to set up an economy of their own. The building up of a farming economy under these difficult conditions was a gradual process that went on for several centuries after Lucrezia Borgia's initial intervention. The Diamantina estate remained in the hand of the Estes until the mid 1700s, when it was given to the marshal Gianluca Pallavicini, who undertook restoration both of its buildings and its agriculture. In 1870, the estate was incorporated in the property of senator Silvestro Camerini, who resumed land reclamation works and improved on earlier ones, and also built a number of farmhouses. The low productivity of the area favored the persistence over time of wheat-growing on large extensions of arable land, on which the building complex stands. The earliest reclaimed areas in the province of Ferrara derive their historical character from an actual remodeling of the countryside surrounding the town, beginning as early as the mid 1400s. The nearby Castalderia di Casaglia—a vast marshy area extending over more than 1,000 ha was also transformed by the marquis Borso d'Este, between 1450 and 1460, into a series of farm holdings centered on a new reclamation village called Casaglia Nuova. Less than a century later, the residents (mentioned in documents of the time as *bocche*, literally, "mouths") in the Diamantina area had increased to over 340.

Fig. 13.7 The Diamantina palace

As regards its integrity, the estate presently still displays the typical settlement pattern of the lower Po River plain, with a main building cluster serving as the organizational center and small isolated clusters scattered over the area. The estate's production is still strictly agricultural. Some features of the field layout have remained unaltered over the centuries, in spite of changes both in crops and in farming methods. The land reclaiming works that freed up these vast spaces for cultivation in the first place are still an integral part of the new design of the Diamantina rural landscape. Notably, the Canal Bianco, the central axis of the drainage system, follows the same rectilinear course shown in an early sixteenth century map of the area. Along with the traditional herbaceous crops, fruit trees are now grown on the more suitable soils of the estate, partly modifying an agricultural landscape that had once made the area deserve its characterization in a local rhyme: "Diamantina, passa e cammina" (Diamantina, just walk by). What most deserves interest, however, is the integrity of the Diamantina landscape over the centuries. Historically and culturally significant features such as land reclaiming works and traces of old land subdivisions are still well visible here, especially when no vegetable covering is present (Fig. 13.7).

The area's vulnerability lies in the possible negative impact of urban residential or industrial building expansion on the settlement structure and its relationship with the surrounding landscape. Besides, further modifications of farming systems may negatively affect the reclaiming works that still define the character of an agrarian landscape whose crop structure has already been deeply modified.

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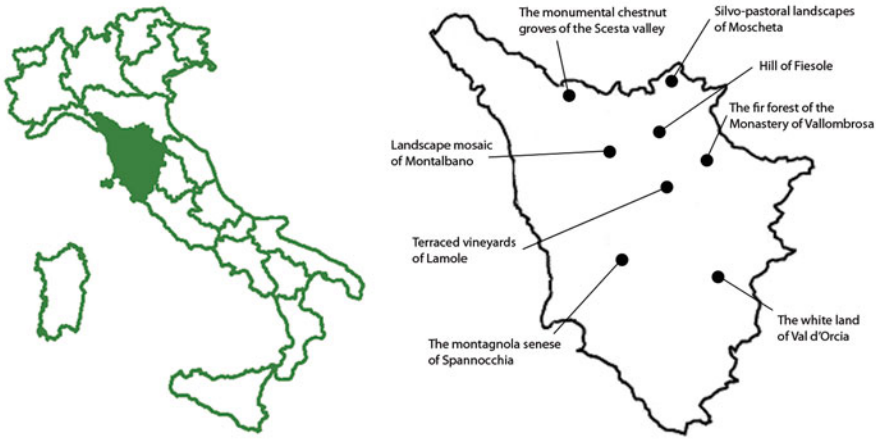
Chapter 14
Tuscany

Mauro Agnoletti



14.1 Introduction

Few regions have been celebrated for the beauty of their landscape as much as Tuscany. Today this region is regarded as a prime example of a cultural identity that owes its significance, in part, to the high standard of living that goes with it. Significant elements of the region's historical identity still live on in the present landscape. These, however, coexist with other aspects that reflect the construction of a public image promoted by a number of different subjects. Historical identity and public perception do not necessarily coincide in their image of a landscape that is certainly one of the most significant expressions of the region's identity, but that cannot be allowed to be influenced by phenomena that have not previously stood the test of

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history. The selected areas, although they hardly do justice to the variety of the region's landscape, are nevertheless representative of long-standing realities, and can thus be regarded as epitomizing at least part of the Tuscan territory, considering that they all lie in the north-central part of the region. The region's territory is mainly hilly (66.5 %) and mountainous (25.1 %), with few plains (8.4 %) and an extensive coast (397 km), and encompasses a variety of environments modeled by agriculture. The first farmers to put their stamp on the landscape were the Etruscans. The technique of training of grapevine on trees (*vite maritata*) was a model not just for Tuscany, but for much of north-central Italy, in contrast with the Greek-influenced shrub or pole vineyards typical of the southern Italian regions. This is one of many expressions of ancient agricultural lore. It answered the need to keep the grapes lifted far above the humid soils typical of much of the region, and led to the expansion of these treed vineyards (*alberata*), which used to dominate the Tuscan, Umbrian and Marche landscape until at least as late as the 1960s. We are thus looking at about 3,000 years of history, and this alone would be reason enough for safeguarding this form of cultivation, regardless of technical or economic considerations, often invoked to justify its disappearance. We have not been able to find a sufficiently extensive treed vineyard area. This type of cultivation only survives in the form of small relics dotting the countryside, maintained by elderly farmers who sense that their importance goes well beyond their economic utility. As in the rest of Italy, the expansion of farmland under Roman rule was followed by centuries of abandonment with a trend to a prevalence of woodland and pastures. This gave rise to landscape features, especially in the Lombard age, that endured well into the nineteenth century (see the text on Moscheta), surviving even the spread of sharecropping, which had less landscape impact in the south of Tuscany than in the north. In the centuries following the year 1000, extensive marshes formed in the plains and along the coast as a consequence of the abandonment of agriculture. Monasteries on mountain peaks dotted the Apennines (see the texts on Vallombrosa and Moscheta). Farming was slowly resumed. It is not until the development of sharecropping and then the beginning of the Renaissance that we finally witness the rise of the Tuscan *bel paesaggio* mentioned by Sereni, immortalized in many pictorial works and praised by foreign travelers. In his account of his voyage in Italy in 1580, Michel de Montaigne wonders at the fully terraced and cultivated mountains of Tuscany, covered with edible chestnut trees, grapevine and olive trees. It was a true garden tended with meticulous care, well represented by Lorenzetti's fourteenth-century fresco *Buon Governo del Territorio* (Wise Management of the Land), which celebrates and prescribes, at the same time, the guidelines to be followed in land management. Various examples of this historical landscape survive at Larciano and Lamole, alongside with areas historically characterized by barer landscapes, which today dominate tourist magazines (see the text on Val d'Orcia). In the Renaissance, investments in estates promoted the villa landscape, a perfect merging of elegance and *utilitas* (see the text on Fiesole). But it is the eighteenth and nineteenth centuries that put the definitive stamp on the rural landscape of Tuscany. A mass migration of people towards the mountains and upper hills determined an extension of agricultural colonization to its historical maximum. The backbone of this development was the sharecropping system. Terraces,

contour terraces and mixed cultivation were also introduced in Maremma, thanks to the reclaiming of marshy areas. The woods were now almost completely integrated into the agricultural system, being mainly used as grazing grounds. Edible chestnut woods dominated the mountains (see the text on Valle dello Scesta), now extending down the slopes all the way to sea level, in competition with the olive groves. Starting in the early twentieth century, the landscape began to lose its complexity as a consequence of the abandonment of the mountain. This was already perceivable in the first postwar period, gained massive proportions after World War II, and was eventually followed by a general abandonment of the countryside. Forests, formerly a third of the regional territory, today take up over half (51 %) of it, encroaching on cropland and abandoned pastures. The former are reduced to 31 %, the latter to a mere 6 %. The expansion of specialized monocultures and of the forest have determined a reduction of the diversity of the landscape mosaic by 45 % compared to the nineteenth century. Since the 1970s, public policies have tended to favor the industrialization of agriculture. Public incentives have seldom been given to promote the development of the traditional landscape as a source of economic revenue, and environmental policies have often confused the conservation of nature with that of the landscape. It is a process whereby two apparently contradictory facets of globalization, industrialization and renaturalization, appear to join forces to undermine the identity of the landscape. Some interesting signs of discontinuity, however, are perceivable. As in the case of the restoration of historical rural buildings—a now consolidated cultural trend that has restored the dignity and economic significance of rural settlements—today there is a new interest in traditional farming, first and foremost among the farmers themselves. The activities of the Spannocchia farm and the wines produced on the restored terraces of Lamole are an important signal of an agriculture that for centuries as striven to capitalize on the past to proceed towards a future that is still laden with uncertainties, but nevertheless closer to the deeper significance of the Tuscanian landscape and a concept of integral quality of the countryside that ultimately provides a better answer to the needs of society.

14.2 The Fir Forest of the Monastery of Vallombrosa (43° 44′ 00″ N; 11° 34′ 00″ E)

The historical core of the forest of Vallombrosa extends around the homonymous monastery over about 400 ha in the municipality of Reggello, in the province of Florence. This state-owned area ranges in altitude between 700 and 1450 m a.s.l. It is included in the “Vallombrosa e Bosco di S. Antonio” SCI and the “Foresta di S. Antonio” ANPIL (Protected Natural Area of Local Interest). It is also a Natural Biogenetic Reserve and under landscape restrictions as per laws 1497/39 and 431/85. Vallombrosa can be reached from Florence by taking SS 67 to Pontassieve, then SS 70 towards the Consuma Pass. After a couple of kilometers there is a turn for the towns of Pelago and Tosi. From here, one follows the indications for Vallombrosa.

Fig. 14.1 The fir forest of the monastery of Vallombrosa is a testimony of the construction of a landscape carried out by Benedictine monks at least as early as the sixteenth century and continued by the Royal Forestry School in the second half of the nineteenth century

Land use 2010	Surface (ha)	Surface (%)
Fir forest	209.61	34.42
Mixed fire forest with conifer	80.34	13.19
Mixed fire forest with broadleaved	51.35	8.43
Urban area and courtyard	18.22	2.99
Arboretum	16.78	2.75
Mixed broad-leaved forest	29.25	4.80
Chestnut coppice	2.39	0.39
Douglas fir forest	24.37	4.00
Beech forest	148.70	24.42
Fallow	5.55	0.91
Vegetable garden	0.96	0.16
Mixed of Austrian and larch pine forest	2.76	0.45
Mixed of Austrian and larch pine forest with conifer	0.44	0.07
Mixed of Austrian and larch pine forest with broadleaved	14.86	2.44
Meadow with tree	3.46	0.57
Total	*609.06*	*100.00*
Evaluating indices of landscape		
Number of land uses	15	
Number of patches	67	
Total surface area (ha)	609.06	
Average surface area of patches (ha)	9.09	
Average surface area of forest patches (ha)	11.39	
Hill's diversity number	6.62	
Class of landscape integrity (I–VI)	IV	

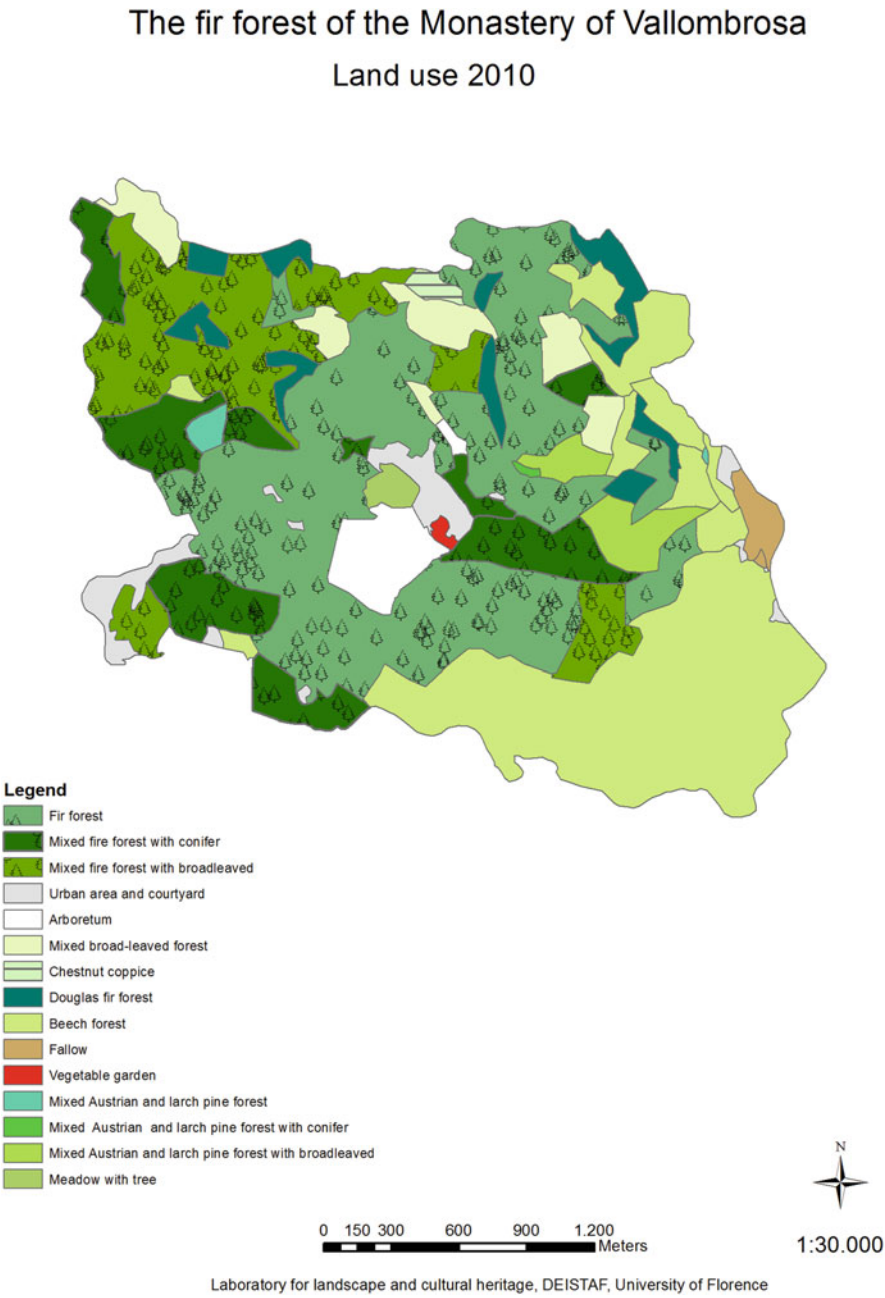

Fig. 14.2 The landscape of the monastery of Vallombrosa, founded in the 11th century, is characterized by the presence of artificial pure stands of Silver Fir, according to the Benedictine monastic silviculture tradition. The landscape is hardly intact, given that fir forest only accounts for 35 % of land uses, whereas 21.6 % of the area is covered with mix formations of conifers, and 24.4 % with beech woods. The pure fir stands are concentrated around the abbey, which is an important element of the history of the area

Vallombrosa lies on the western versant of the Pratomagno mountain range, an offshoot of the Tuscanian and Romagna Apennine extending southeast from Mount Falterona. The area has a rather craggy morphology, with steep slopes and variable exposure. The geology is dominated by an Oligocene formation composed of vast alternating banks of sandstone with different structures and textures.

The area owes its significance both to the historical persistence of a forest management model that supplied fir lumber for centuries and to the role of Vallombrosa in the development of forest science in Italy. The Congregation of the Vallombrosans was founded by San Giovanni Gualberto dei Visdomini, who withdrew to Vallombrosa in 1015 together with some Benedictine monks who had left the monastery of San Miniato. During the two following centuries, the abbey's estate expanded considerably thanks to several donations. This was a consequence of the spread of sharecropping, since chestnut and beech were a lot more useful to farmers than silver fir. The landscape that developed from the sixteenth century onward, instead, was a product of the economic interests of the monks. They started a profitable lumber trade and hence gradually replaced the beech with fir. Their management of the fir groves favored coetaneous and monospecific populations of regular rows of seedlings replacing felled trees, as part of what was known as "monastic silviculture". This management model was typical for the Benedictines and contrasted with the Franciscans' more "natural" approach. Later on, the monks' forest management methods were further developed by the managers of the first Italian forest science school, founded at Vallombrosa itself in 1869. Following the principles of German economic silviculture, they definitively changed the forest's structure, favoring a vast expansion of coetaneous fir woods. As a consequence, since 1869 the fir forest has expanded from 245 ha to over 600 ha, 70 % of which were managed by clearcutting until at least as late as 1970. After the foundation of the school there were heated debates, which have gone on down to our days, about the health of the woods and which was the best management model, renaturalization or monospecific fir forest. This debate provides an interesting perspective on the evolution of scientific thought and environmental culture in Italy, a subject which lack of space does not allow us to go into here. It will suffice to mention that in the late nineteenth century Vallombrosa was a popular summer sojourn location among the Florentine middle class, who criticized the landscape impact of the foresters' management policy. The resulting debate gained such resonance that it even led to direct intervention by the ministry. It is also noteworthy that John Perkins, U.S.A. ambassador to Italy and a major exponent of environmentalist thought, resided and died at Vallombrosa. Presently, Vallombrosa houses a "Silvomuseum" run by the State Forest Corps. The museum manages part of the historical fir woods—about 100 ha—around the monastery and houses a collection of equipment formerly belonging to the forestry school. Today the school is used for field drills by the Forest Science students of the University of Firenze. There is also the "Arboreto" here, a rich collection of forest species formed as a support to the teaching and research activities of the Regio Istituto Superiore Forestale (Royal Institute of Higher Forestry Education), whose building stood in the state-owned forest of Vallombrosa as early as 1869.

The part of the woods that still retains its integrity lies around the abbey. There is a plan to preserve it by appropriate forest management practices. The remaining fir

woods are evolving into mixed broadleaf woods, a phenomenon first observed in the 1980s, following the ceasing of silvicultural practices. Abandoned edible chestnut tree groves are also undergoing a process of "renaturalization" as silver fir and various broadleaf species colonize them. At high altitudes, the beech groves, part of which are coppices and part high stands, are in fair condition. Parcel 90 houses a monumental Douglasia stand planted by Aldo Pavari, the pioneer of forest ecology in Italy, with some plants growing taller than 50 m. This is now 90 years old and entering a phase of senescence. Some of the tallest trees have already been felled.

As regards vulnerability, further abandonment of forest management would determine a spontaneous evolution of the pure-fir forest into a mixed one dominated by broadleaf species. Especially around the abbey, the conservation of the fir woods depends on the maintaining of cultivation practices based on clearcutting and replanting. Another threat to the fir woods is posed by two parasites, *Armillaria mellea* and *Heterobasidion annosum*. However, today the tourist and landscape-historical significance of the area is to the fore and this bodes well for its preservation in the future (Figs. 14.1, 14.2).

14.3 The *Biancane* of the Val d'Orcia (43° 01′ 53″ N; 11° 46′ 02″ E)

The *biancane* landscape described here extends over about 3,000 ha in the central part of the Val d'Orcia, within the municipalities of Pienza, Montepulciano, Chianciano and Sarteano in the province of Siena. The area lies at altitudes between 300 and 700 m a.s.l. It is mainly privately owned, with only a small public part. It is included in the "Lucciolabella" SCI and SPA, the "Crete dell'Orcia e del Formone" SCI and SPA, and the "Val d'Orcia" ANPIL (Protected Natural Area of Local Interest), and under landscape restrictions as per laws 1497/39 and 431/85. Chianciano can be reached from the A1 by exiting at Querce al Pino and taking the SP 146, which goes on to Montepulciano and then Pienza. The geological substratum is prevalently constituted by the typical Pliocene clays of the Radicofani basin, which extend all the way to the Apennine ridge connecting the mountains of Chianti to Mount Cetona. This substratum surfaces along the crest of this ridge in arenaceous and marl clay formations. On the valley bottom are more or less recent alluvial deposits.

The landscape of Val d'Orcia owes its significance to the historical persistence of geological formations of great beauty set in a landscape mosaic dominated by vast bare fields, and pastures extending over gentle hills often topped by rows or single-standing cypresses. The *biancane* are low light-colored dome-shaped rises not exceeding 10 m in height. They occur both in isolation and in small groups and owe their color to sodium sulphate that rainfall causes to seeps into the ground and is then brought back to the surface by evaporation. In the middle of the area is a significant landmark, the Castelluccio Farm, originally a complex of medieval buildings and land belonging to a community of Cistercian monks known as Grancia, subsequently purchased by the Hospital of Santa Maria della Scala di Siena in 1480. It included

a castle, the Foce inn, now housing the farm, and the *castrum* of Chiarantana. The farm included about 20 holdings, including some very large ones. The holdings that did not have land suitable for vineyards and olive orchards were assigned small plots in other holdings for that purpose. The farm, which originally extended over about 3,000 ha, went through three important changes of ownership over the last centuries. In 1786 it was assigned to the Dei di Chiusi family, who sold it to the Mieli bankers from Rome in 1847. In 1924 it was purchased by the Marquis Antonio Origo, who conducted extensive renovation. After the war, the Marquis left part of it to two cooperatives of his former sharecroppers and the rest to his two heirs, Benedetta and Donata. In spite of the now split ownership, the original farm unit is still recognizable today thanks to the retaining of the original clay-basin pasture and bare field farming methods. The present landscape can be regarded as the result of works carried out before the war, which according to the owner himself were undertaken to strengthen the farm's original vocation. Important rural buildings were also erected as part of these works. They were commissioned to the English architect Cecil Pinsent, the same who had overseen the establishment of the celebrated Italian garden of the Foce villa-farm. It is remarkable that a landscape that today has become a symbol of the Siena countryside—one has only to think of the zigzag rows of cypresses at Lucciolabella—was actually created in the twentieth century as the result of a special economic conjuncture, as well as special cultural circumstances. Today this land yield high-quality products such as the PDO "Terre di Siena" oil, the wines "Colli Senesi" DOCG (Controlled and Guaranteed Origin Denomination), the "Orcia" DOC (Controlled Origin Denomination) and "Montepulciano" DOC.

The farm's landscape, as well as that of the Val d'Orcia as a whole, still shows a good degree of integrity of the historical farming landscape. The works carried out in the 1930s allowed an increase of the number of holdings and changes in the crop structure; most notably, the extension of mixed olive groves to the higher-altitude holdings. Uncultivated patches—mainly of erosive terrain on *biancane* and *calanchi*—were strongly reduced, but still retain high landscape importance, and are hence under protection in the restricted area of Lucciolabella. Thus, in spite of some changes in the crop distribution, the landscape is still dominated by its traditional bare fields, and pastures where sheep often graze. The characteristic cypresses enhance the area's verticality.

The main threat to the landscape of Val d'Orcia is building expansion, which has occurred over the last few years around small centers such as Contignano and Monticchiello, but also in scattered holdings. In the Castelluccio area, this threat has been averted so far, thanks to opposition from the Origo heiresses, the particular legal status of the two cooperatives, and the fact that the higher parts of the holdings are being managed by the Comunità Montana of Cetona. In the next few years, however, there is the risk that the legal restrictions that have so far hindered the proliferation of new buildings for the tourist industry will be dropped. This would lead to the loss of the relationship between historical buildings and the landscape that is one of the acknowledged qualities of the area. Furthermore, the last 50 years have witnessed a simplification of forms of soil use, due not just to changes in crops but especially to damage to the olive groves caused by the frosts of 1985 and 1993.

Fig. 14.3 The *biancane* of Valdorcia are a typical landscape of central Tuscany, characterized by extensive cultivations of cereals

Other vulnerabilities include an excessive use of cypresses for ornamental purposes, which is indeed typical of the historical landscape of Tuscany, but on a much smaller scale (Fig. 14.3).

14.4 The Monumental Chestnut Groves of the Scesta Valley (44° 02′ 25″ N; 10° 39′ 12″ E)

These monumental chestnut groves occur in a forest area extending over about 2,300 ha in the municipality of Bagni di Lucca (LU) at altitudes between 240 and 1,000 m a.s.l. Land ownership is part private and part public. The public part is controlled by a "Società dei beni già comunali" (Society of Formerly Municipal Property). The area is included in an SCI (Monte Prato Fiorito-Valle dello Scesta) and is under landscape restrictions as per law 431/85. The nearest settlement is the sub-municipality of San Cassiano di Controne, which can be reached from the Altopascio exit on the A11. From here one follows the road signage to Borgo a Mozzano and Bagni di Lucca until one reaches the crossroads for the Orrido di Botri, which leads to San Cassiano. The Scesta valley lies about 4 km east of San Cassiano.

The area is characterized by deeply cut valleys with very steep sides, and very strong differences in altitude between crests and valley bottoms. The terrain is mainly composed of limestone, dolomitic stone, marl and, in lesser measure, argillite, commonly designated as schist. The rocky formations display a recumbent anticlinal fold subsequently segmented by many recent tension faults. Both deep and superficial karstic phenomena have resulted in very interesting shapes such as the many dolines, swallow holes and furrow fields.

The area owes its significance to its centuries-old edible chestnut groves, with numerous monumental trees, a testimony of the importance in history of the chestnut tree as an economic resource for the populations of the Apennines. The chestnut

groves alternate with coppice woods, mainly of Turkish oaks, recently converted to high stands, set in a spectacular mountain scenery. The chestnut trees often grow to exceptional sizes, with circumferences of over 9 or 10 m. The percentage of very large trees is larger here than in other chestnut areas. Various forms of terracing and buildings connected to chestnut farming add to the landscape's interest. The buildings include stables and chestnut-drying houses, as well as some groups of eighteenth-century buildings. The area is a testimony of the importance of the so-called "chestnut civilization". Italian mountain populations managed to survive thanks to the calories supplied by chestnuts, the possibilities for livestock grazing afforded by chestnut groves, the many uses the wood could be put to, and the use of its foliage as forage. The area is mostly divided between private and public properties. There are also some commons managed by the "Società dei beni già comunali" of San Cassiano di Controne. The footprints of wild ungulates can be found in the area, and wolves have been spotted. Settlements are sparse and the valley is far removed from the usual tourist and automobile routes.

The Scesta valley's chestnut tree landscape still retains a fair degree of integrity, with rural buildings and terraces. These, however, are in an evident state of abandonment. Some private landowners are striving to revive the cultivation of edible chestnut trees and restore a complex of buildings near Silviglioli. A new forest track was created to allow these landowners easier access to the groves and buildings. Other private owners are still maintaining their chestnut groves and their often renovated rural buildings.

As regards vulnerability, although the integrity level of the landscape is still high, some elements do threaten its conservation. The main threat is abandonment, as a result of which the groves are evolving into mixed woods and monumental specimens are dying through neglect and exposure to diseases. Besides chestnut cancer (*Criphonectria parasitica*), whose virulence is presently on the decline, the ink disease (*Phytophthora cambivora*) was diagnosed in several specimens, including some monumental ones, which desiccated while still standing. In general, the area is undergoing conspicuous reforestation processes that are undermining the landscape value of summit meadows, which apparently only periodic fires can help to preserve. Conservation is also jeopardized by contradictory indications regarding the utilization of rural development plan funds. These indications often interpret proper grove maintenance as the cutting of deteriorating monumental trees and their replacement with seedlings, rather than the conservation of monumentality. As to the terraces along the versants, if they are not regularly maintained hydrogeological instability and vegetation succession can ensue. It is thus not merely a matter of preserving the traditional landscape, but also of containing erosion. Some rural buildings are still in good condition, whereas others are deteriorating through neglect. Both the monumental chestnut groves and the historical buildings would require joint action by the superintendencies of architectural and landscape heritage, as well as the council for the environment and agriculture of the Tuscany Region (Fig. 14.4).

Fig. 14.4 The Scesta valley's chestnut tree landscape is at least 400 years old, but abandonment is threatening its conservation. Unfortunately, according to the regional interpretation of the European HABITAT directive, chestnut orchards are not a habitat to protect, but rather mixed woods with chestnut, resulting from the abandonment of chestnut cultivation

14.5 Hill of Fiesole (43° 47′ 42″ N; 11° 17′ 59″ E)

This area extends over about 200 ha in the broader context of the southern versant of the Fiesole hills, at an average altitude of about 125 m a.s.l., in the municipalities of Fiesole and Florence. The land, which is privately owned, lies within the "Monte Ceceri" ANPIL (Protected Natural Area of Local Interest) as well as the "Torrente Mensola" ANPIL, and is partly under landscape restrictions as per laws 1497 of 1939 and 431 of 1985. The area can be reached by the road from Florence to Fiesole by way of San Domenico, or from Settignano taking Via G. D'Annunzio, and from here the local roads of Fontanelle, Camerata, Palmerino, Salviatino, Poggio Gherardo, Vincigliata and Benedetto da Maiano into the countryside. The area has a heterogeneous geological substratum, as it lies along the limit between the lake deposits of sandy clays, sand and gravel lenses of the Upper Villafranchian in the area between Ponte a Mensola and San Domenico, and a lower area of rises composed of the Macigno formation (upper Holigocene and lower Miocene), with quartziferous and feldspathic sandstone alternating with silt shale and argillite.

The area owes its significance to the historical persistence of a traditional farming landscape of exceptional beauty dotted with historical villas, extending between the towns of Florence and Fiesole. The area still retains many of the typical features of the *bel paesaggio* of the Tuscan hills, portrayed in innumerable pictorial

and literary works. It is a valuable example of one of those rural areas classified as *poli urbani* in the national rural development plan; areas, that is, characterized by the simultaneous presence of dense human settlement and agricultural features. The landscape is dominated by mixed cultivations with fields combined with vineyards and especially olive and fruit trees, on regular or contour terraces. There are many farmhouses and villas. The latter feature gardens, religious buildings and tabernacles, dry-stone walls and ornamental trees such as domestic and sea pines, holm oaks and cypresses, isolated, arranged in groves, or lining the typical local white roads. There are still about twenty rural villas, erected between the thirteenth and nineteenth century. They include the monumental villa of Maiano, the fourteenth-century villa of Poggio Gherardo, where Boccaccio allegedly set his *Decameron*, and the Renaissance Villa I Tatti, with its beautiful garden, once a refuge for the scholar and patron of the arts Bernard Berenson, today housing an international research center. There are also about 25 old farmhouses. Farmland took up a very high percentage of the area from the Middle Ages to the mid twentieth century. The holdings, managed by sharecroppers, were small, extending over a few hectares, and almost always entirely cultivated. The aggregation of this highly fragmented property into middle or large-sized farms was hindered by high demand and, hence, the high price of land. At the limits of the area are many abandoned quarries. Their sandstone, known as *pietra serena*, was widely used from antiquity until recently in the building industry, to line canals, and to pave local roads. The sandstone hills of Monte Ceceri and the rises of Vincigliata and Castel di Poggio underwent systematic reforestation with cypress, pine, holm oak and downy oak beginning in 1929. Today they are covered with dense woods.

While the area's architectural heritage is still intact, its traditional farming landscapes show a lower degree of integrity. Nevertheless, this versant of the Florentine hills overall still retains an important part of the Tuscan traditional landscape. It should be included in UNESCO's world heritage list, just like the historical center of Florence. Today, historical crops survive on small plots, with a prevalence of regularly spaced olive groves. Terraces and contour terracing are still widespread. In some areas there are still olive groves laid out in scattered patterns. For many years now, agriculture has become a secondary, almost marginal economic activity; although there are still at least 150 active farming businesses within the municipal boundaries of Florence. Agriculture is increasingly taking on the character of a part-time activity, mainly carried out to maintain the rural landscape and the area's residential value. This is also true of many other rural areas in Tuscany. In other words, we are confronted with a situation where the historic "villa gardening" has been extended to agriculture, which is hence practiced today as a means to preserve a landscape that in much of Tuscany has been dramatically altered by the intensification of agricultural production. True farming businesses today include the Maiano Farm—an agrotourism with about 110 ha of olive groves cultivated with biological methods—and the I Tatti farm, which produces high quality wines such as Chianti Colli Fiorentini DOCG (Controlled and Guaranteed Origin Denomination), Rosso Toscano IGT (Typical Geographical Indication) and extra virgin oil on its 35 ha.

Fig. 14.5 The hill of Fiesole constitute one of the most valuable periurban landscapes in Italy. Here the historical landscape of the *villa*, with its associated agricultural landscapes, is still preserved

The area's vulnerability is high. The main threat is posed by abandonment and crop simplification, which could soon set off processes of deterioration of the historical landscape, partly as a result of the loss of the water-management structures required for soil stability. Many terraces with olive and fruit trees and vegetable gardens are showing clear signs of deterioration. Rural buildings require restoration and renovation, under strict government control. The slopes need maintenance to minimize hydrogeological risk, and the traditional agricultural fabric needs to be restored. Here, as elsewhere, the term "natural area" is ill-suited to a landscape that has been modeled by man down to its smallest details. This should be taken into full account in planning, whose priority should be to protect the historical landscape. These restoration actions could be carried out in the framework of existing programs for protected natural areas and regional rural development plans, as well as programs for the promotion of typical local products, in consideration of this landscape's universal appeal and to allow its collective fruition by Florence and its metropolitan area (Fig. 14.5).

14.6 The Montagnola Senese of Spannocchia (43° 13′ 26″ N; 11° 11′ 37″ E)

The Spannocchia Farm extends over about 445 ha in the municipality of Chiusdino, in the province of Siena. It is a privately owned area partly included in two SCI, that of "Montagnola senese" and that of "Alta Val di Merse", and under landscape

restrictions as per law 431/85. It lies at an altitude of about 400 m a.s.l. It can be reached from Siena by driving for about 25 km on SS 73bis and then taking SP 31. A few kilometers after the center of Rosia one turns left and follows the signs for Spannocchia. The Spannocchia farm extends onto a versant that belongs to the metamorphic group of the Montagnola Senese. This is constituted of 10-million-year-old Miocene breccia known as "Breccia di Grotti", composed of cavernous limestone in a sandy matrix. In the northernmost parts of the area are formations of the Verrucano Group, composed of sedimentary rock (quartzite, anagenite and schist) showing low-degree metamorphism. The climate is Mediterranean, Type 5 in Blasi's classification ("humid hill" climate). As to the area's phytoclimatic classification, it corresponds to the cold sub-zone of *Lauretum*.

The farm is a significant example of the historical persistence of the agricultural landscape of the Montagnola Senese, with fields and vast wooded areas covering about 82 % of its surface. The first written documents mentioning Spannocchia date back to 1225. They concern the donation of a portion of the farm by Zacaria dei Spannocchi to the monks of the nearby convent of Saint Lucy to obtain protection for the soul of his mother, Lady Altigarda. The remains of the monastery are still preserved, as are the medieval fortress known as Castiglione che Dio Sol Sa and the Romanesque Ponte della Pia. The farm remained in the ownership of the Spannocchi family until the early twentieth century, when it was sold to the Florentine Delfino Cinelli, an aristocratic writer. It lived on as an agricultural production center based on the sharecropping system until World War II, when Delfino's son, the Count Ferdinando Cinelli, transformed it into a cultural and educational center, partly by establishing an "Etruscan Foundation" here in 1959. Today, thanks to Randall Stratton and Francesca Cinelli's commitment, the Castello di Spannocchia has become a living museum of the traditional rural life of Tuscany, where farming is conducted with great respect for the historical characteristics of the landscape. In 2002, the Spannocchia Foundation was established. Its objective is to spread the know how and values of Tuscan rural civilization and rural archaeology abroad, especially in the United States, thanks to the active contribution of the heirs of the Cinelli family. The farm nevertheless retains its economic function, its main activity being the biological production of wine, oil, fruit and vegetables.

The Spannocchia area still retains a high degree of landscape integrity. It was one of several areas chosen for the performing of multitemporal analyses as part of a program to set up a system to monitor transformations of the Tuscan landscape. These analyses indicated that the ration of woods to fields and pastures here are still quite close to what they were in the early nineteenth century. The farm, with its fortified farmhouse and a number of rural houses, is still active. The way it has been managed has played a decisive role in preserving its traditional characteristics. The management sought to preserve the features of the area's original landscape while promoting typical local products and rural tourism. It also started several scientific and cultural activities to promote and preserve the landscape, and undertook restoration, not only of buildings, but also of soil uses. The farm has hence become a model for the management of the characteristic landscape heritage of the Montagnola Senese.

Fig. 14.6 Spannocchia is a farm where the management aims to preserve the historical features of the rural landscape

While independent, the Spannocchia farm is situated in an area that is undergoing constant transformation. It is thus vulnerable to land development planning, the oscillations of tourist flows, and the vagaries of the agricultural market. The farm has refrained from industrializing its cultivation systems and depends on its own resources—agrotourism and the sale of typical local farm products—for its survival. This, however, exposes it to the risk of both the market and public administrations not rewarding its efforts adequately. The absence of provisions for specific regional funding in rural development programs limits the possibility of cutting the costs of conserving the traditional landscape. In some cases, existing laws and regulations do not allow a landscape restoration program to be drawn up. As in the case of wood expansion as a consequence of field or pasture abandonment, current legislation forbids the restoring of earlier soil uses, unless it is compensated by costly reforestation elsewhere; a measure that is unjustified in the case of this farm, considering the general increase of woodland everywhere and its already great extension within the farm itself. Even attempts to reintroduce grazing in woods to produce quality meat and sausages are hindered by norms that place strong limitations on this practice for fear that it will undermine natural forest renewal. Such prescriptions ignore the existence of silvicultural techniques that are perfectly adequate to prevent this and the desirability of producing quality food in this manner. In general, this situation increases the separation of agriculture and the

forest, which were once deeply integrated in the typical Tuscan sharecropping farm (Fig. 14.6).

14.7 Landscape Mosaic of Montalbano (43° 50′ 01″ N; 10° 53′ 34″ E)

The agroforestal landscape of Larciano extends around the homonymous town in the province of Pistoia. It extends over about 160 ha, mainly privately owned, with altitudes ranging between 50 and 400 m a.s.l. Larciano can be reached from Florence by taking the FI-PI-LI "superstrada" to Empoli, from here SP 13 towards Vinci, and then turning left onto Via Collinare (SP 123) towards Lamporecchio a few kilometers before reaching Vinci. From here one follows the signs for Larciano-San Rocco. The area lies on the Empoli versant of Montalbano. It is a secondary mountain ridge with a northeast-southwest orientation. It is delimited to the north by the crest of the ridge, to the south by hilly undulations formed of marine and lake deposits gently sloping down towards the plain, whereas the western and eastern boundaries are marked by two streams, the Fosso Agnese and Fosso delle Gargole. The geological substratum is the formation known as the Macigno del Chianti, composed of feldspathic sandstone interbedded with clay.

The area around the small town of Larciano is a typical example of the historical persistence of a landscape type that is often found on the hills of Tuscany, one of many variants of the terraced hills of the region. It is remarkable because here it forms a real microcosm, a clearly distinct system where the three basic components of the physical landscape—the geomorphological foundation, the settlement system, and soil use—show a high degree of integration. The prevalent form of cultivation is the traditional olive grove, which is found on many of the slopes. The groves often extend up all the way to the roads along the crest, and thus constitute a feature of great landscape value and highly representative of the area's agricultural identity. The groves often stand on contour or regular terraces. Fruit trees are frequently interspersed among the olive trees. There are some vineyards in the area, too, although over very small surfaces, where the DOCG (Controlled and Guaranteed Origin Denomination) Chianti wine, subzone Montalbano, is produced. The oil is PDO-recognized as "Toscana, subzone Montalbano". Woods mainly extend in ravines and on versants whose acclivity or exposition makes them unsuited to agriculture. The area is an excellent example of the morphologically distinct land systems typical of the southwest versant of the Montalbano. Here the regular morphology of relief, with alternating hills orthogonal to the main ridge and steep canyons eroded by water courses, has favored the rise of relatively independent landscape units. The resulting historical settlement pattern is hence closely connected to the agricultural fabric. In the territory of Larciano, the historical settlement is the hub of the surrounding area. It lies along the main road along the crest. The crops extend along the slopes, while ravines and steeper slopes are occupied by woodland. The historical center of Larciano Castello is especially remarkable. Like other minor centers of the Empoli versant, such as Vitolini, Montevettolini or Cecina, it originates from an early

Fig. 14.7 The castle of Larciano lies on terraced slopes with olive groves that are a characteristic feature of the Montalbano area

Middle Age "castling" process that dotted the Montalbano countryside with fortified burghs, which turned into rural villages once self defense was no longer a concern.

The Larciano area, in spite of some inevitable changes it shares with many of the rural communes of Tuscany, still boasts a relatively intact landscape structure. Here terracing and irrigation works, such as dry-stone walls, runnels and aqueducts, are still integrated into the road and settlement structure. The superficial water drainage system, in its turn, connects with the natural system of wood vegetation in the ravines. The route system allowing access to local resources—an elaborate network reaching down from the crest through the cultivated areas to the water courses in the ravines—bears witness to the intensity of "agrarian anthropization" processes until the middle of the last century. This system still allows easy circulation within the area.

The highest vulnerability issues in the area depend on the abandonment of farming, and agricultural intensification. In some parts of the area, woodland is expanding over land less suited for agriculture due to lack of exposition or acclivity. Elsewhere one remarks abandoned terraces whose dry-stone walls are in critical conditions or overrun with vegetation. In general, well or decently preserved structures are found near farming, or former farming, centers, or small rural house clusters. These are mainly concentrated in the central part of the area, immediately north of the historical center of Larciano. Conservation gradually worsens as one moves away from the main routes, especially in steeper or hard to access places. The state of terraces and dry-stone walls also depends on the character of ownership and the social characteristics of the subjects who manage them. The same factors influence the condition of olive groves (Fig. 14.7).

14.8 Silvo-pastoral Landscapes of Moscheta (44° 04′ 10″ N; 11° 25′ 45″ E)

The silvopastoral area around the abbey of Moscheta extends over about 500 ha in the municipality of Firenzuola, in the province of Firenze. The area is a mainly publicly owned and in small part privately. Altitudes range between 500 and 900 m a.s.l. The area is included in an SCI (Giogo–Colla di Casaglia) and under landscape restrictions as per law 431/85. It is also fully included in the soon to be instituted "Parco del paesaggio rurale Appenninico" (Park of the Apenninic Rural Landscape). Moscheta can be reached from the A1 by exiting at Barberino del Mugello and driving on to San Piero a Sieve, then taking SP 503 to the Passo del Giogo and Firenzuola. A few kilometers from the Passo del Giogo, having reached Rifredo, one turns right onto a road that ends at the abbey. The area is a valley on the northern versant of the Giogo-Casaglia Apenninic complex. It is surrounded by rises on three sides and open towards the northwest. The geological substratum of the valley bottom is constituted by heterogeneous, prevalently clayish chaotic earth. The versant areas, instead, are part of the Romagna Arenaceous-Marly Formation.

The area lies in what is known as "Romagna Toscana". It is characterized by the historical persistence of a typical central-Apenninic landscape, dominated by beech groves, bare and treed pastures, edible chestnut groves, and important agricultural and religious structures. Moscheta is a significant example of the role of monasteries in the management of the Apenninic landscape in the first centuries of the second millennium. It developed around the abbey founded in 1037 by San Giovanni Gualberto. The decadence of the abbey after the sixteenth century was followed by its suppression following the reforms of the Grand Duke Pietro Leopoldo (1748). It was subsequently purchased by the Martini family and became a sharecropping farm, until 1950, when it was sold to the state and later passed on the Tuscany region in the 1970s. Today it is managed by the Comunità Montana del Mugello. Part of the exquisite abbey building, now restored but deconsecrated, is still preserved, as well as part of the agricultural fabric that was already there at the time of the abbey's foundation, including drying areas for chestnuts and many areas where charcoal was made from the local beech. A number of farms from the sharecropping period survive around the abbey, as well as monumental chestnut groves about 250 years old. The chestnut groves produce the PGI-designated Marrone del Mugello (Mugello Marron). The landscape is remarkable not just for its agriculture and rural structures, but also for its beauty and the widespread appreciation of its value among the local population. The area is presently designated "Parco del Paesaggio Rurale Appenninico". The park, instituted in 2007, extends over about 1,000 ha. It is managed according to its own landscape plan. The administration of the province of Florence proposed to extend the park to include the whole Giogo-Casaglia district. A small landscape museum was set up inside the abbey.

The integrity of the selected landscape appears quite good. Compared to the nineteenth century, a sharp reduction of the number of soil uses is observable. Elements of historical persistence are not found all over the park, only in certain parts of it. The valley-bottom pastures are maintained thanks to the presence of a horse farm, as

Fig. 14.8 Monumental chestnuts orchards and pastures are the most important elements of the thousands-of-years-old landscape of Moscheta. The chestnut orchards are currently restored and maintained

well as whole herds of fallow deer that are grazed there. The monumental chestnut groves are in fair condition and are constantly maintained by the Community. Small holiday farms around the abbey and horse-riding tourism sustain the area's vitality as a recreational center, especially during the summer. Some of the farmhouses of the old sharecropping holding have been renovated and are rented to trekkers by a local cooperative.

As regards vulnerability, abandonment and the ensuing increase of the woods has strongly reduced pastures and almost done away with farming, which today is only carried on by a few private individuals on small areas around rural buildings, with a few dozen grazing animals. The management of the SCI, in spite of the importance of the pastures for the conservation of biodiversity, has still done nothing to halt their disappearance. On the contrary, it tends to encourage the processes that are leading to the deterioration of the historical landscape, and forest legislation hinders pasture restoration. Indeed, the present management is in favor of renaturalization, the reintroduction of animal species such as ungulates, which are proliferating beyond control over the whole region, and wolf. This policy can hardly coexist with an attempt to restore the local manmade landscape. The lack of specific legislation for rural parks providing reliable and unambiguous guidelines leaves the carrying out of rural development programs to the goodwill of individual officials and the availability of funding. Another important issue is that the digging of tunnels for the high-speed Bologna-Florence railway line has sharply reduced the flow of the surrounding springs and torrents (Fig. 14.8).

14.9 Terraced Vineyards of Lamole (43° 33′ 02″ N; 11° 21′ 20″ E)

The area in question, located in the municipality of Greve in Chianti, extends over about 650 ha. Its landscape is presently characterized by the presence of terraced vineyards around the town, and wooded areas in the outermost part of the area. The land is privately owned. The center of the area is the town of Lamole (600 m a.s.l.). It can be reached by exiting the A1 at Figline Valdarno and driving to Greve in Chianti; then taking SR 222 southward towards Panzano in Chianti and, about 1.7 km from Greve, turning left onto the road that leads to Lamole 7 km away. The geological substratum is formed of lorbiditic quartziferous-feldspathic sandstone with calcite, phyllosilicate and silt schist. In the south part of the area is yellowish marl from the Oligocene.

The area owes its significance not only to the historical persistence of shrub vineyards and olive groves on terraces, but also to its landscape's scenic beauty and the careful restoration of terraces by some landowners, who are now producing high quality wine on them. The origin of the name Lamole is uncertain. It apparently derives from the Latin word *lamulae*, meaning "small blades", strips of earth. The area was certainly already known in the Middle Ages. In 1835, Emanuele Repetti wrote in his *Dizionario geografico fisico storico della Toscana* that Lamole "lies on the northern slope of the Poggio delle Stinche" and "the vineyards that yield the good and much praised wine of Lamole are planted among the rocks of this hill". Until 50 years ago, the agriculture of Lamole was characterized by an extreme exploitation of all the available cultivable surface, conquered by the work of hundreds and a technique refined over the centuries in an area with an average acclivity above 30 %, and often exceeding 50 %. Level surfaces for cultivation were provided by terracing. Drainage works limiting surface erosion were especially important. Pits were dug, one meter wide and one deep. Stones were placed on the bottom to form a drain. This was called the *gattaiola*, because allegedly it was tested by making a cat (*gatto*) go through it. Above the drain were arranged stones of sizes decreasing as they approached the surface. Finally, the pits were filled with earth. If there were some stones left at the end, the plot was further divided by building walls closer to one another and terraces only a few meters wide. By releasing through the night the heat accumulated during the day, the walls played an important role in the maturation of the grapes. The exodus from the countryside in the 1950s and 1960s in a few years brought the population of Lamole down from 900 to 70 individuals. In the early 1970s, after a period mainly devoted to putting back together a very fragmented property, the restoration of the vineyards began. Because of the spread of mechanization and the need to reduce labor, on more level ground the *a ritocchino* (perpendicular to the slopes) planting method replaced the *girapoggio* method (along the contour of the hill). The old vineyards on the less accessible terraces are being abandoned year after year. Since about a decade ago, the whole approach to viticulture in the area has been fully reconsidered. Many terraces have been fully restored, as has shrub vine cultivation. Now the wines produced here, besides being of great quality, have a close relationship with the quality of the landscape.

Fig. 14.9 The terraced vineyards of Lamole, besides having remarkable landscape value, are an example of a courageous initiative to restore terraces to make them productive again

The area's integrity is high, mainly thanks to the restoration of the terraces, the persistence of polyculture, the restoration of rural buildings, and the very low rate of urbanization. Rural tourism has had a very positive impact here. In spite of ample oscillations, its growth rate has been higher than any other economic activity in the region, and in the Chianti district it plays an especially important role. Lamole still retains historical features of the Chianti landscape that elsewhere have been transformed by intensification, especially as a result of the expansion of *a ritocchino* vine monocultures, which led to the elimination of many terraces and the mixed crops that once prevailed in the area; replaced by extensive plots with regular shapes that fit ill with the mosaic of small-scale land uses typical of sharecropping. The case of Lamole shows that it is possible to develop modern viticulture by rediscovering the role of traditional techniques and the landscape in the promotion of an area, as an advantage that the competition cannot emulate.

The elements of vulnerability in the area are numerous. The terraces needs constant maintenance and are more costly than other methods of cultivation. Furthermore, it is hard to obtain authorization to restore them by freeing them from the woodland that has invaded them. Thus, for farms to be able to restore and maintain the terraces, a legislation update is needed, as well as carefully programmed rural development plans allowing access to the economic incentives already provided for in the National Rural Development Plan, instead of actions aimed at increasing the yields and quality of products without any regard for the landscape. At the same time, the typical products of the historical landscape need to be promoted as a means to boost the

area's "competitive identity" and assist its acknowledgement by the market. Without such support, local owners will be left to themselves, with the risk that their efforts will not be rewarded. This may lead Tuscan viticulture as a whole to lose ground to high quality and low cost products from other countries that are presently expanding on the world market (Fig. 14.9).

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Chapter 15
Marche

Piero Bevilacqua

15.1 Introduction

Similarly to Umbria and Tuscany, the countryside of the Marche Region has been shaped through the centuries by the activity of farmers living in scattered holdings. The Marche is a region of hills and mountains, and agriculture has had to adapt to difficult soils and environments. Presently, in agriculture, 42.5 % of the land is used for cultivations, 32.8 % is woods and only 6.7 % is pastures. Because of these difficulties, farmers have had to develop a particularly sophisticated environmental culture, which would allow them to be economically viable while respecting the delicate balance of a particularly fragile ecosystem. In the hill areas—as Sergio

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Anselmi notes—the small holding system has been successful, preserving 'the territory, creating a myriad of perfectly integrated economic ecosystems, not only through a variety of cultivations using a combination of crops, vine and olives, with the rotation of forage cultivations, but also through an ingenious irrigation and draining system, which exploited rainwater and adopted 'natural' defenses based on hedges and carefully positioned trees, used for timber, fruit, and leaves.

In the Marche Region too the 'Great Transfrmation' of the mid-twentieth century has produced phenomena similar to the ones of other regions. The development of industrial activities in the few plains of the region, has not only subtracted land from agriculture, but also induced migration from mountainous agricultural areas to the plains. As a consequence, in the mountains and higher hills, the consequences of the decline of agriculture are clearly visible. Woods and shrubs are advancing, the old chestnut woods are disappearing, old farms and settlings are often in disrepair. But even in the lower hills, as well as in the plains, the landscape has been violently simplified by the development of tree-less wheat fields, in which hedges, terraces and ridges are also eliminated and tractors are used. Mechanized agriculture has erased the century-old traditions that had characterized agriculture. As noted by Marco Moroni: 'The patiently constructed draining system is no longer maintained.

The areas selected in the Marche region exemplify a very diverse range of situations. The Hills of Maiolati Spontini are a splendid fragment of the mixed landscape typical of sharecropping agriculture. These hills extend for 1,200 ha on the right bank of the Esimo river. Agriculture includes terraced vineyards, wheat fields, and olive orchards, surrounded by woods and scrubland. In this area, the variety of cultivations and the preservation of traditional environmental balance seems to challenge the passing of time. Very different is the habitat of the Altopiano (plateau) of Macereto, in the province of Macerata, north-west of the Monti Sibillini National Park. Here, dominated by the imposing Mount Bove, there is a plateau that maintains both the appearance and the actual economy of a bygone age. The plateau is characterized by meadows and pastures and is surrounded by mountains, on whose lower slopes grow thick beech woods. About 5,000 sheep are permanently herded here while other herds are kept here only part of the year. In the hills of Loretello (Arcevia), woods typically alternate with crops. The area is dotted by castles and fortified settlements once serving to control the territory and the agrarian economy. Near Macerata, there are the olive orchards of Coroncina, whose presence is attested already in the fifteenth-sixteenth century. About 170 ha belong to the territory of the municipality of Caldarola while others are found in other municipalities. These olive orchards produce quality oil and also promote the image of these hilly areas, often characterized by a rough terrain with bare patches and others covered only by shrubs. The area of Sasso Simone and Simoncello, in the municipality of Montefeltro, part of the Italian State's Military Land (*Demanio Militare*), includes one of the most significant Turkish oak forests, which for centuries was managed as coppice and is presently maintained by the military authorities, with trimming and cleaning of the undergrowth. The woods combine with pastures and meadows where the free range of animals is still practiced, a increasingly rare form of animal farming in Italy, which is essential to the preservation of the traditional landscape and its biodiversity.

15.2 The Plateau of Macereto (42° 58′ 36″ N; 13° 06′ 55″ E)

The plateau of Macereto is one of the distinctive landscapes of the Sibillini mountains. It is located at altitudes ranging from 900 to 1,100 m a.s.l. and extends for about 2,000 ha, on both public and private land, in the municipalities of Ussita and Visso in the Valnerina valley, in the province of Macerata. It is part of the Parco Nazionale Monti Sibillini (Monti Sibillini National Park). The landscape is protected under law 432/85. The splendid calcareous rocks of the Bove mountain serve as background to the pastures of the plateau. Economic activities in the area have always been completely centered on shepherding. The geological substratum is partly made of Scaglia Cinerea and partly of Scaglia Rosata (the term *scaglia* or 'flake' is used by Italian geologists to refer to thin, tabular stratifications of homogeneous pelagic limestone). The Scaglia Cinerea is characterized by the presence of marl and calcareous-argillaceous gray, greenish, or reddish schist, while the Scaglia Rosata is formed by calcareous-marly schist with red chert.

The area is highly significant, due not only to the historical persistence of vast pastures with isolated trees, but also of a 1529 sanctuary by Bramante, the greatest expression of the Renaissance in the Marche region. According to the legend, it is here that on August 12, 1359, mules carrying a wooden statue of the Virgin with Child from Loreto to the Kingdom of Naples stopped and refused to move on. Extensive beech woods surround the pastures on the slopes of the tall mountains that enclose the plateau. The existence of common land rights in the area has influenced the landscape, in which enclosures are almost entirely absent. No vine or cereal cultivations are present, though old documents attest to the past presence of vineyards. These pastures were once known for the presence of the *sopravissana* sheep, a cross between the Spanish Merino, the French Rambouillet and local varieties, which provided an excellent wool. However, the loss of commercial interest in this type of wool and, more in general, the difficulty of mechanically milking this variety of sheep has led to its replacement with other varieties. The survival of two sedentary herds, with official organic certification, has made it possible to maintain centennial traditions, including the production of the *pecorino vissano* cheese, which, though much appreciated, was on the verge of disappearing. In Cupi, a small mountain settlement whose economy continues to be based on sheep farming, the small farm Pastorello di Cupi, managed with passion by Beniamino Ciammaruchi, produces, in its small manual laboratory the real *pecorino of Cupi* cheese, made exclusively with sheep milk and natural rennet. In the settlement of Cupi, there is also a small museum of shepherding, where the traditional life of shepherds can be rediscovered. In the summer, herds of *vitellone bianco* or fatted calves of the Central Apennine (PGO label), which are also typical of the area, are also brought here to graze, while in the summer they are kept inside in the locality of Vallestretta. Recently, a plantation of saffron has been started in Cupi, which is used to produce a special type of cheese.

The landscape of the Macereto plateau has a high degree of integrity. Secondary pastures retain their integrity thanks to the herds that pasture here in the period between June and October. Besides the sedentary herds, which amount to about 3,000 animals, many others are taken here during the summer: the transhumance, that is

Fig. 15.1 The fascinating scenery of the Macereto plateau

the annual migration of herds to warmer areas, is still practiced, though nowadays it is done with trailer trucks. The permanence of sheep in the area in wintertime is not easy, because of the mountainous climate and the frequent snowfalls. Some sheep of the *sopravissana* variety still exist, but their survival in the area is dependent on the few animals of the organic farm Pastorello di Cupi, though the reintroduction of this type of sheep in the Sibillini mountains is one of the priorities of the Park authority.

The vulnerability of the area is tied to the abandoning of shepherding and the consequent disappearance of pastures, already evident in the locality of Vallestretta. The reduction in the number of animals favors the growth of new spontaneous weeds and worse the development of secondary phases with the growth of shrubs, especially juniper, which for a long time was a species protected by regional legislation. This phenomenon is particularly visible in the locality of Arette. Also the black pines (*Pinus nigra*) used in numerous reforestation projects encroach on the native beech woods and do not fit in well with the local landscape. The presently uneconomic nature of sheep farming activities endangers not only those activities but also the traditional landscape. The surviving shepherds lament the lack of public support and the difficulties associated with organic certifications, and threaten to give up shepherding. The end of traditional transhumance has caused the abandoning of a number of typical small rural buildings, with square or semicircular design, which are still quite visible but now in ruins. The buildings were used by shepherds as temporary dwellings and to make cheese. They were made with stones obtained from the breaking up of the pastures and had no proper roof, other than a covering of branches and leaves in the summertime (Fig. 15.1).

Fig. 15.2 Low density olive orchards are a traditional form of the landscape of central Italy

15.3 Hills of Maiolati Spontini (43° 28′ 55″ N; 13° 06′ 55″ E)

The hills of Maiolati Spontini in the province of Ancona are characterized by the presence of traditional polyculture along with wooded areas. The hills extend for about 1,200 ha in the northern part of the municipality of Maiolati Spontini, from the sub-municipality of Scisciano, to the west, up to the border with the municipalities of Monte Roberto and Castelbellino, to the east. The area is private property. It is located on the right bank of the Esino river, which marks its border in the valley. Its altitude varies between 130 m a.s.l. in the valley and 400 m a.s.l. at the top of the ridge. The landscape is entirely protected under act 1497/39 and for a small portion under act 431/85. The hills can be accessed by taking state route SS 76 and exiting at Maiolati Spontini–Castelplanio and then taking the provincial road known as 'dei Castelli,' in the direction of Maiolati Spontini and Cupramontana. From this road you can take other secondary roads that go through the area of the hills. Geologically, the area consists of blue marly and silty clays, sometimes slightly sandy, with scarcely cohesive sands and sandstone, of lower Pliocene origin. In the area along the river, terraced gravelly and sometimes partially sandy fluvial deposits are found.

The significance of the landscape is tied to the historical persistence of an agricultural mosaic characterized by the presence of fields with olive-trees, vines and wheat, a typical sharecropping pattern, and small woods, which are integrated in the rural economy and used mostly for timber and firewood. Essential to the management and cultivation of the land was the presence of the monks of the communities of S. Michele di Massaccio, now Cupramontana, with their wheat mills set on the two banks of the river Esino, and of the abbeys of S. Elena and S. Sisto. In general,

the monastic communities of the eleventh century where the protagonists of the agricultural and civil renaissance of the entire area. The monks have 'built' a landscape characterized by a balance between cultivated areas and woods, cultivating not only wheat, olives and wine-grapes, but also creating a thick network of conducts used both for irrigation and to power the mills. The abbey of San Sisto, dating to the thirteenth century, is located at the center of vineyard on a clay terrace a few 100 m from the Esino river. All the castles positioned on the summits of the hills flanking the Esino valley have for centuries owned the 'woods of the Community,' a fundamental economic resource for local populations, used for both firewood and timber. The woods began thinning out since the first half of the seventeenth century but have resumed expanding in the second half of the twentieth, and remain a salient feature of the rural landscape. From the sixth century A.D. to the seventeenth century, these hills were entirely covered by woods. The expansion of agriculture caused a reduction of wooded areas in favor of crops and vines *maritate* (wedded) to field maples (acer campestre), i.e. vineyards using maple-trees as props. In the 1950s and 1960s,

Land use 2007	Surface (ha)	Surface (%)
Urban area and courtyard	75.51	7.19
Arboricolture	7.36	0.70
Shrubland	25.14	2.40
Oak forest	179.22	17.08
Vineyard with olive tree	1.62	0.15
Complex cultivation pattern	5.06	0.48
Water course	16.65	1.59
Fruit orchard	16.38	1.56
Fallow	35.97	3.43
Olive grove	76.57	7.30
Abandoned olive grove	3.46	0.33
Afforestation	14.83	1.41
Arable land	282.71	26.94
Arable land with tree	27.94	2.66
Arable land with olive tree	63.89	6.09
Hedge and tree rows	32.12	3.06
Riparian vegetation	49.71	4.74
Road system	8.67	0.83
Vineyard	123.82	11.80
Abandoned vineyard	2.86	0.27
Total	*1049.49*	*100.00*

Evaluating indices of landscape	
Number of land uses	20
Number of patches	1010
Total surface area (ha)	1049.49
Average surface area of patches (ha)	1.04
Average surface area of arable land patches (ha)	0.94
Average surface area of forest patches (ha)	1.78
Hill's diversity number	10.45
Class of landscape integrity (I–VI)	IV

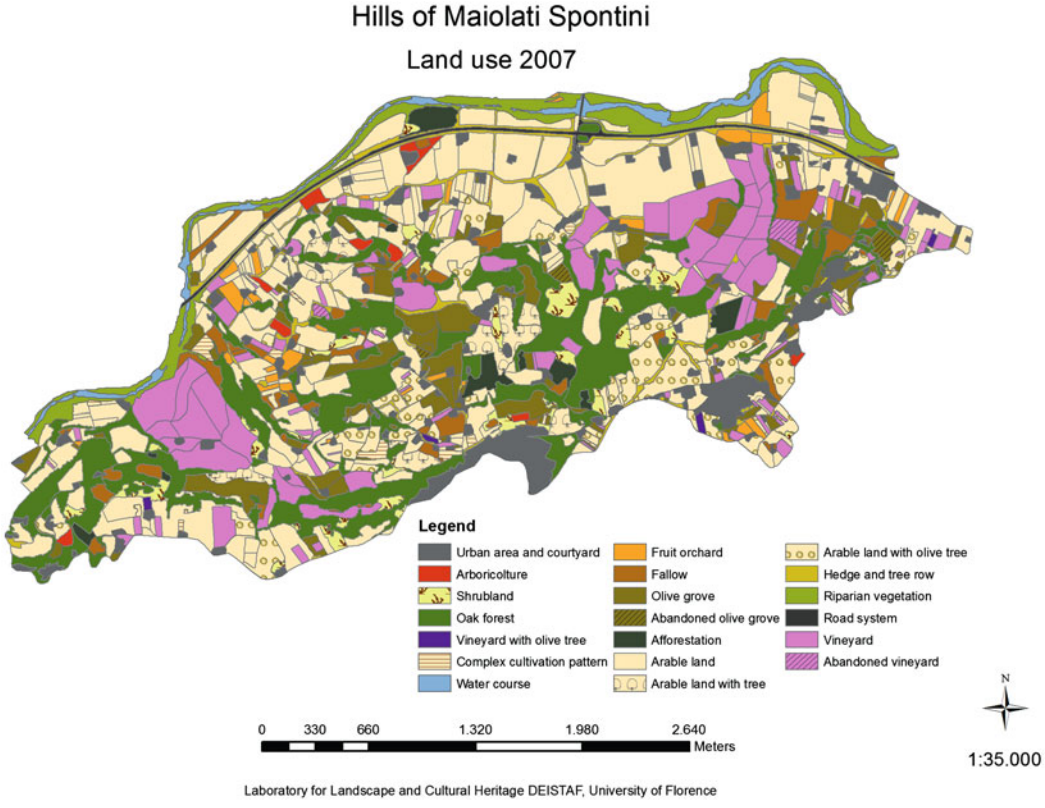

Fig. 15.3 The significance of the landscape of Maiolati Spontini is tied to the persistence of the traditional mixed cultivations of the sharecropping landscape pattern, arable with trees or olives, vines with trees and arable land, characterizing the historical landscape of Umbria, Tuscany and Marche regions. These features, together with a high fragmentation of the mosaic (1,010 patches in an area of 1,040 ha), the small surface of agricultural (0.94 ha) and forest patches (1.78 ha), contribute also to a high biocultural diversity. Overall, the historical landscape of Maiolati Spontini appears quite intact, due to the above features and the persistence of almost 60 % of traditional land uses in this area

the area experienced a massive emigration of farmers. In the abandoned areas, the woods expanded, with a prevalence of holm oaks, English oaks and poplars. The local wine has been assigned the 'Esino' DOC (Controlled Origin Denomination) label.

The landscape maintains an good degree of integrity. The farmhouses along with the various traditional cultivations have survived, although the vineyards with maple-trees have mostly disappeared. In the area, there are many centennial oaks and olive-trees, for example at the border with the municipalities of Monte Roberto and Castelbellino, along via Boccolina, almost on the border of the woods. Some of the ancient farmhouses have been restored and are now used as tourist farmhouses. In the area near the river, in the thirteenth century there were many water mills, connected to a thick network of canals. Further down the valley, instead, was the beginning of the old canal that since the fourteenth century had brought water from the river to the mill called Molino della Torre, property of the City of Jesi. Nowadays, more than 2 km of the canal are still extant. The canal and the mill, which remained active up to the beginning of the twentieth century, attest to the historical importance of the entire area from an agricultural and economic perspective.

The greatest present vulnerabilities for the rural landscape of the Hills of Maiolati Spontini are the risk of further abandoning of lands, of the intensification of agriculture in other areas, and of erosive phenomena. So long as the co-presence of small wooded areas and traditional cultivations will continue, these phenomena will be kept under control, but if this balance is altered due the intensification of cereal cultivation, of sunflowers, or of olives and wine-grapes, as in other areas of the province, they will become a serious problem (Figs. 15.2, 15.3).

15.4 Olive Orchards of Coroncina (43° 07′ 55″ N; 13° 13′ 04″ E)

Though discontinuously distributed, the olive orchards of Coroncina, in the municipality of Caldarola, in the province of Macerata, impart a distinctive character to the local landscape. The area extends for about 550 ha, in the eastern part of the municipality of Coroncina. The olive orchards are mostly located in the sub-municipalities of Pievefavera, Croce, Vestignano and Valcimarra, at altitudes varying between 350 and 550 m a.s.l., on private land. The area can be reached by exiting state route SS 77 at Caldarola and then following the roads that lead to the various sub-municipalities. Alternatively, one can take the provincial road SP 78 and turn in the direction Caldarola at Santa Maria di Pieca. The hills on which the olive-trees of the Coroncina are grown belong to the Marche ridge, which is characterized by a substratum of well-stratified gray flaky sandy marls and blue silt and marly clays. In the hilly part towards the sub-municipality of Pievefavera there substratum consists of marl and grey and green marly limestone, while the area closest to the Lake of Caccamo (or Lake of Borgiano) consists of debris flow deposits. A thick network of streams

crisscrosses the territory of the five communes, the main one being the medium section of the Chienti river. Part of the area benefits from the mitigating effect of the microclimate of Lake Caccamo.

The significance of the olive orchards of Caldarola lies in the historical persistence of a varied scenery, in which the dominant olive cultivations of ancient origin combine with coppice woods of downy oak, untilled areas undergoing spontaneous forestation, and pastures with traces of ancient olive orchards, as well as numerous hedges and rows of trees used to mark the borders of fields. The olive orchards are small in size, often located on steep and scarcely fertile terrain. They are mainly oriented towards the south and the south-west and sometimes are still characterized by a low-density 'scattered' arrangement, with no fixed pattern. The first information on the importance of olive farming in the area of Caldarola, as well as that of neighbouring municipalities, date to the fifteenth-sixteenth century, as evidenced by old documents, and by the existence of centennial trees and ancient olive-oil mills, such as the one in Camporotondo. Small olive-oil mills are in fact found throughout the area. Among these the main one was possibly the one of the parish church of Pievefavera, which, at the start of the seventeenth century, was given to the Reverend Apostolic Chamber in exchange for certain land rents. This parish mill was shut down only in the 1950s. It was then re-opened in the 1980s by a cooperative, and definitely shut down in 1997 following a major earthquake. Since the mid-1960s, the 'Coroncina' had been officially labelled as one of the typical varieties of olive oil of the province of Macerata. The one produced in the territory of Caldarola and Camerino is listed as 'higher hills variety.' It is presently a much appreciated typical local product. In particular, the olive oil 'mono-variety Coroncina' is listed as Traditional Food Product by the Ministry of Agricultural Alimentary and Forest Polices. The presence and visibility in niche markets of this olive oil is helped by the scenic quality of the areas in which the olives are cultivated and gathered: rural environments in which the relation between people and nature is still balanced, also because of the absence of intensive agriculture and of the limitations on urban expansion in rural areas, a tendency which characterizes instead many other rural areas of the Marche and other regions.

The landscape of the olive orchards of the Coroncina, in its various aspects, appears to generally maintain a reasonable degree of integrity. The olive orchards occupy about 140 ha, but the olive-tree landscape extends to other municipalities for a total of 1,200 ha. Along with olive orchards using traditional patterns, there are also new orchards characterized by closer rows and greater density of trees, which alter the traditional look of the landscape. The farms that grow olives are all family businesses and the pieces of land set aside in each holding range in size from 0.5 to 2.5 ha. Cultivation techniques are still traditional, manure is used as fertilizer and no irrigation is usually done. Pruning is usually done every 1 or 2 years by family members, transmitting the culture of olive farming from one generation to the other. Olives are harvested from the end of November to the beginning of December, both manually and with pneumatic rakes. In the 1960–1980 period, young people often gave up farming, though in some cases they continued to work the land as a secondary

occupation. In more recent years, however, some farms have increased the cultivation of Coroncina olive-trees, aiming at a quality product and sometimes combining agriculture with farmhouse tourism. Up to now, there has been no intensification of agriculture, nor have the orchards been replaced by crop fields or pastures with isolated olive-trees.

An element of vulnerability is the danger of an intensification of agriculture which would lead to a gradual specialization of cultivations, as described above. Another danger for the olive orchards lies in the poverty of the soil and the low winter temperatures, with possible frosts even late in the year. The Coroncina variety has developed over the centuries a strong resistance to parasites and harsh climactic conditions, especially the scarcity of water, but the cold remains its worst enemy. Low temperatures of −5/−6 °C can damage the leaves and especially the flowers, the more sensitive organs, although blossoming occurs rather late, thus compromising production (Fig. 15.4).

Land use 2010	Surface (ha)	Surface (%)
Arboricolture	12.57	1.49
Shrubland	8.74	1.03
Recreational area	0.60	0.07
Woodland	235.56	27.89
Fruit orchard	1.57	0.19
Fallow	12.67	1.50
Abandoned olive grove	3.49	0.41
Irregular spaced olive grove	18.80	2.23
Regular spaced olive grove	111.73	13.23
Vegetable garden	1.23	0.15
Urban area and courtyard	70.92	8.40
Arable land	243.68	28.85
Arable land with tree	12.20	1.44
Arable land with olive tree	94.33	11.17
Arable land with vine and olive tree	0.44	0.05
Vineyard	14.35	1.70
Vineyard with olive tree	1.76	0.21
Total	*844.63*	*100.00*

Evaluating indices of landscape	
Number of land uses	17
Number of patches	714
Total surface area (ha)	844.63
Average surface area of patches (ha)	1.18
Average surface area of arable land patches (ha)	1.02
Average surface area of forest patches (ha)	2.35
Hill's diversity number	6.61
Class of landscape integrity (I–VI)	II

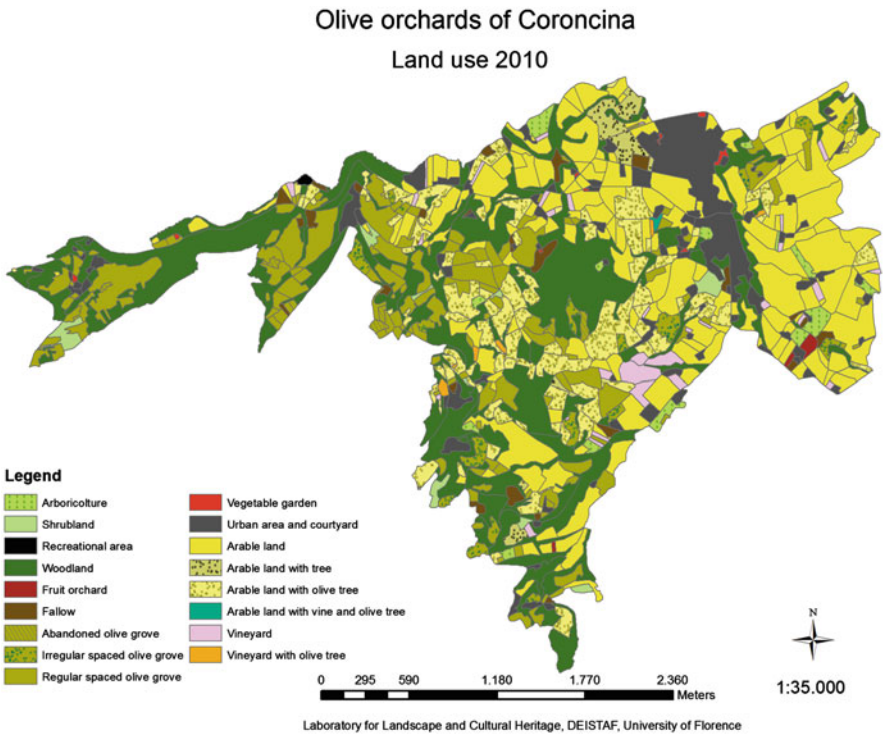

Fig. 15.4 The landscape of Coroncina is traditionally dominated by olive groves, coppice woods and mixed cultivations. Today we find above all regular spaced olive groves (13.2 %), while the irregular ones are very few (2.2 %), although there are still several mixed cultivations. The landscape mosaic is composed mainly of arable land, medium size patches, with an average surface area of about one hectare. Overall, the historical landscape shows a low level of integrity, despite olive groves and arable land with olive trees are still common. This degradation is due to the increasing intensification of agriculture reducing mixed cultivations, as well as to the spread of new orchards characterized by a very high density of trees especially suited for mechanization

15.5 Piagge of Ascoli Piceno (42° 50′ 25″ N; 13° 34′ 34″ E)

Adjacent the old city walls of Ascoli Piceno, there is a cultivated area known as the Piagge. The area extends for about 500 ha at an altitude ranging from 200 to 500 m a.s.l. The area is located within the municipality of Ascoli Piceno. It is privately owned and protected under landscape law 197/39 and 431/85. Many streams and torrents run through it and partly mark its borders. More specifically, the torrent Castellano marks its northern border, separating the area from the historical centre of Ascoli, while to the east the area is delimited by the gorge of Gran Caso. The Piagge extend on the northern slope of Mount San Marco and can be reached from Ascoli Piceno by taking provincial road SP 76, known as ‘road of San Marco,’ and going

south beyond the city walls. Geologically, the area is characterized by a substratum of travertine debris flow in the upper areas, above 300 m a.s.l., while in the area closest to the town, the geological substratum is made of gray-green calcareous marls with interbedded brown limestone.

The landscape of the Piagge is significant insofar as it represents a rural area rich in historical elements, in terms of the work done on the slopes, the type of agriculture, and the extant rural buildings. The area is emblematic of the intense relation between city and country in Italian history, and of the traditional identity of rural landscapes, in contrast with the ever expanding modern city, which by eroding agricultural land has sometimes compromised century-old heritages. Up to the mid-twentieth century, the Piagge where sharecropping land. Between the 1950s and the 1960s, the religious body Opera Pia 'Istituti Riuniti' granted the use of the land to provide food for the canteens of the local hospital, of kindergartens and orphanages. During those years, many olive-trees were planted for the production of the typical *olive ascolane* (olives of Ascoli). In the 1970s, the land passed to the Town of Ascoli. In recent years, many pieces of land have been gradually sold off to private owners. Among present

Land use 2010	Surface (ha)	Surface (%)
Arboricolture	0.96	0.29
Shrubland	7.53	2.31
Broad-leaved forest	133.87	41.01
Fruit orchard	0.08	0.02
Fallow	15.13	4.64
Fallow with olive tree	5.02	1.54
Fallow with grass	7.12	2.18
Abandoned olive grove	6.13	1.88
Irregular spaced olive grove	8.98	2.75
Regular spaced olive grove	43.64	13.37
Vegetable garden	1.12	0.34
Urban area and courtyard	28.83	8.83
Arable land	13.07	4.00
Arable land with tree	1.12	0.34
Arable land with olive tree	47.79	14.64
Arable land with vine and olive tree	1.44	0.44
Vineyard	3.31	1.02
Abandoned vineyard	0.35	0.11
Vineyard with olive tree	0.94	0.29
Total	*326.41*	*100.00*

Evaluating indices of landscape	
Number of land uses	19
Number of patches	634
Total surface area (ha)	326.41
Average surface area of patches (ha)	0.51
Average surface area of arable land patches (ha)	0.38
Average surface area of forest patches (ha)	1.68
Hill's diversity number	7.11
Class of landscape integrity (I–VI)	III

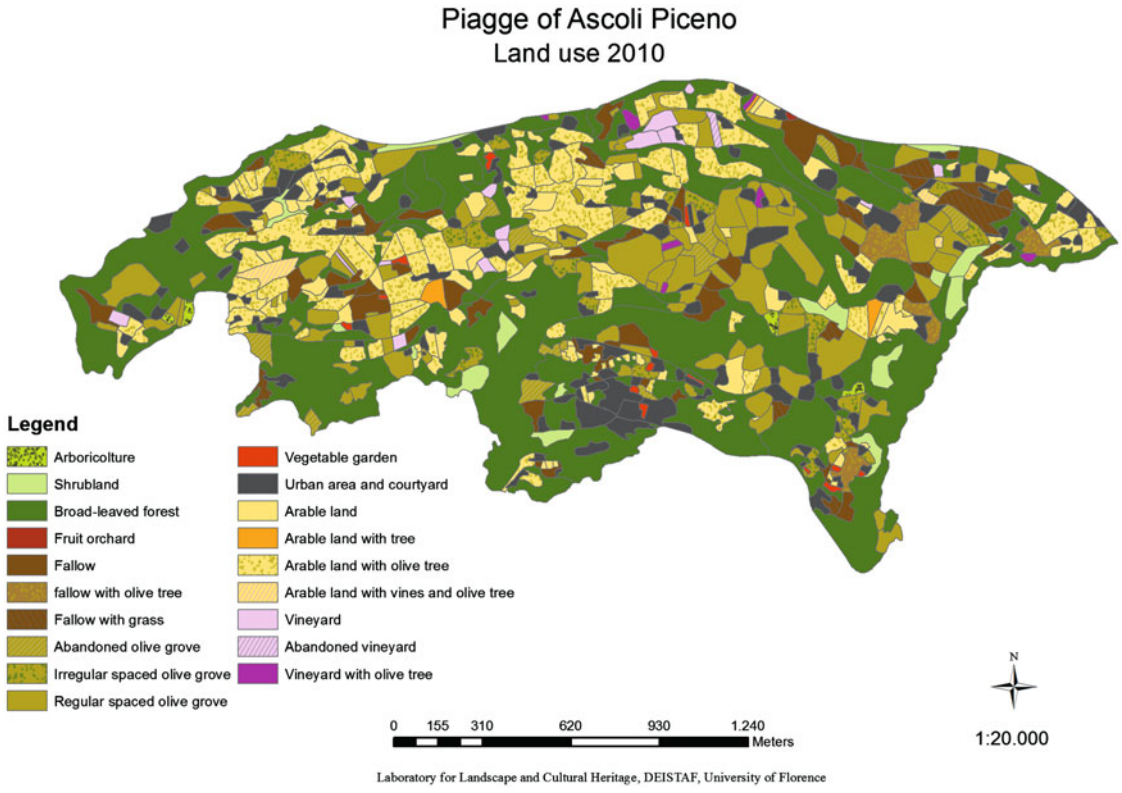

Fig. 15.5 The landscape of the Piagge of Ascoli Piceno shows the historical persistence of mixed cultivations in a suburban context. The landscape mosaic is composed mainly of small sized patches, with an average surface area of 0.4 ha for cultivated patches and of 1.68 ha for woodlands. Arable land with olive trees still makes up 15 % of the land use, although secondary forests due to abandonment are the most important land use (41 %). Overall, the historic landscape shows a medium-low level of integrity, mainly due to the abandonment of agricultural areas

cultivations, the dominant ones are vegetables gardens, crop fields, both bare and with olive-trees, arranged in small holdings often delimited by hedges. Usually the small olive orchards are located near rural houses. The *olive ascolane* of the Piceno area have been assigned the PDO label, and are present in the list 'Ark of Taste' of the Slow Food association, which lists quality food products produced in small quantities. The rural landscape is enriched by pastures and by small woods. Local rural architecture is particularly significant. Typical buildings are rural mansions, houses with tower, rural houses on flat land, usually with an external stairway, rural houses on slopes with internal or external stairway, and a number of smaller items, including wells, washing troughs, fountains and drinking troughs. It is not always easy to identify the traditional architecture, because of interventions by new owners who reside in these buildings, which sometimes have substantially altered the original traits.

Concerning the integrity of the area, a recent research has compared the land register of 1835 to the present situation, showing the persistence of the ancient network of holdings in certain parts of the Piagge. Holdings used to range from 2 to 6 ha, and were evenly distributed over the entire area. They adopted the polyculture system typical of sharecropping agriculture in the Marche. The intensification of cultivations, in the case for example of olive-orchards and vineyards, has partially altered the historical integrity of the agricultural landscape. Many of the present owners, having purchased their land from the township of Ascoli, are now restoring the old buildings. Some have passionately followed rigorous historical criteria, while others have instead modernized the old orchards with new plants for the production of *olive ascolane*.

In recent years, there has been a decline in pastures, but even more in vineyards. The gradual abandoning of agriculture has caused a problematic advance of woods and the degradation of the composite traditional landscape. This phenomenon occurs especially in marginal areas, no longer maintained by farmers. These areas have been practically abandoned to spontaneous vegetation, also because of the difficulty of applying mechanized agriculture due to the steepness of the terrain. The intensification of agriculture based on geometrically arranged high-density cultivations, constitute another element of vulnerability for the traditional scenery. Given the considerable gradient of the land and abundant water, in the past decades it has been necessary to maintain a complex system of small stone canals for channelling the water. Some of these canals are still functional, but the majority have been abandoned and are now in disrepair or buried. Another threat to this valuable rural landscape is the closeness to Ascoli, whose expansion risks transforming rural areas in residential ones, with the inclusion of the Piagge in future building plans (Fig. 15.5).

15.6 Polycultures of Loretello (43° 34′ 18″ N; 12° 56′ 44″ E)

The entire area of Loretello, a locality in the municipality of Arcevia, in the province of Ancona, is characterized by the presence of traditional polyculture. It extends for about 1,500 ha, at altitudes varying between 115 and 300 m a.s.l. The fields are

private property and surround the small town, which can be reached from Arcevia, at about 12 km distance, taking the local roads that run through the sub-municipalities of Montefortino and Torre. The area has the typical morphology of mid-valleys in the Marche region, with a series of medium-high hill ridges, flat and narrow valleys and ample slopes which become progressively more wooded moving from south to north. Geologically the area consists of sand and gray marl.

The significance of the land around Loretello lies not only in the historical persistence of traditional polyculture, but also in the unique relation between cultivated hills and historical settlements on risings, foremost amongst them the Castle of Loretello, which dominates the surrounding slopes. The rural landscape consists of a network of ancient buildings dotting the ridges and the transversal passings. The area was settled in the Higher Middle-Ages far away from the main routes, and belonged to the territory known as the Massa di Sorbetolo. The medieval hill settlements, originally a means to control the agrarian economy and therefore closely integrated with it, are perfectly preserved and restored: They include the castles of Loretello, San Pietro, Palazzo, Piticchio, Nidastore, which date to the period between the eleventh and the fourteenth century. These fortified nuclei vary in type and origin, but all served to protect the land and support the agriculture. The castle of Loretello was founded by the monks of the Fonte Avellana in the eleventh century. It is entirely built of ancient brick and still has a bridge with three arches. The name Loretello refers to the laurel woods that once grew in this area. The hills still show the signs of sharecropping polycultures, of the ancient arrangement of holdings, and of the old rural farmhouses and mansions. The variously cultivated fields often supported by artificial ridges create suggestive patterns, with a visual effect of order and regularity. The dominant cultivations are spelt, corn, chickling, olives and wine-grapes, and the quality of the products is high. Both the spelt (*Triticum dicoccum*) of Loretello and the chickling are listed as Traditional Food Products by the Ministry of Agricultural Alimentary and Forest Polices. The areas closest to the ridges are usually used as pastures-meadows. There is still a sizable presence of woods in certain areas, which alternate with cultivated areas and pastures.

The landscape of Loretello has largely retained its integrity, having maintained throughout the centuries the original relationship between human settlements and cultivated hills. Some elements of the historical landscape, such as rows of trees, artificial ridges, borders marked with trees, are still present, albeit in a sporadic fashion. There is also, however, a tendency towards an intensification of agriculture, which has created cultivations based on fixed patterns that have modified the historical landscape. Typical houses and other constructions harmoniously integrate with the patterns of the cultivations. Among these are iron crosses and country shrines at crossroads (the so called 'figurette' or small figures), rural chapels and small churches, attesting to popular religious sentiment, and, naturally, many farmhouses, some dating to the eighteenth century, which in recent years have been bought and conservatively restored, mainly by foreigners. Particularly interesting are farmhouses typical of the inner Marche region, in which rows of white stone and brick alternate on the façade. Also present are a number of fortified farmhouses with turrets and of mills still endowed with their original machinery. The castles have all been recently

Fig. 15.6 The Castle of Loretello and its agrarian landscape

restored by the town administration of Arcevia, which has included this area in its "Piano Regolatore" (the act that regulates building in the municipality) and defined it as 'District of the Historical Landscape' in which new constructions are forbidden. There is a debate on the possibility of instituting a 'Park of the Historical Agrarian Landscape' due to the great historical and cultural importance of the area and its excellent condition.

The main vulnerability of the landscape is the significant demographic decline of the last few decades, and the consequent lack of maintenance of the land, though in recent years corrective measures have been efficiently enacted, such as the reintroduction of traditional cultivations aimed at the production of traditional and organic food products (spelt, corn, chickling) and the development of agricultural tourism (country-houses and holiday farmhouses). The greatest threat however comes from the intensification and mechanization of agriculture and the consequent merging of adjacent lands, which would lead to the elimination of certain traditional features of the holding system, a phenomenon which has already occurred in adjacent areas (Fig. 15.6).

15.7 Sasso Simone and Simoncello (43° 45′ 58″ N; 12° 17′ 20″ E)

The area extends for about 1,500 ha and is characterized by the presence of woods and pastures. It is part of the "Demanio Militare dello Stato" (the Italian state's military lands), and is located at the border between Marche and Tuscany, in the municipalities of Piandimeleto, Frontino, Carpegna and Pennabilli, in the province

of Pesaro-Urbino, and in the municipality of Sestino, in the province of Arezzo. The contour of the land is rather gentle, characterized by low gradients, often inferior to 15 %, at altitudes between 750 and 1,221 m a.s.l. A small section of the area towards the south-eastern border is located in Tuscany, towards Mount Simoncello and Mount Simone, whereas the north-eastern border corresponds to the border with the municipalities of Carpegna and Pennabilli. The northern border is adjacent to the road that connects the locality La Cantoniera with Valpiano, while to the west it runs almost parallel to the provincial road that connects Carpegna with Pennabilli, and then continues irregularly towards the south-west. Part of the area is included in the Sasso Simone e Simoncello Natural Regional Park, which belongs, both as SCI (Site of Community Interest) and SPA (Special Protected Area), to the Natura 2000 network. The area can be reached through the provincial road SP 1 that goes from Carpegna to Pennabilli, and then from the locality La Cantoniera, or through the local roads that run south-west of Carpegna, towards the localities of San Sisto and Belforte all'Isauro, and accessing the area from Pian dei Prati. The area extends on the left bank of the upper Foglia valley and on the secondary Apennine mountain ridge that is the watershed between the basins of the Marecchia river and the Foglia river. The geological substratum of the two hills is the so-called formation 'of San Marino,' in which massive white limestone is present, while the rest of the area has a more gentle morphology, formed by Holocenic debris deposits and by the 'Complesso Caotico,' i.e. a mainly argillaceous complex with fragments of marly limestone.

The significance of the landscape lies in the historical persistence of pastures and woods, which have been used for centuries. The beauty of the area is enhanced by the presence of Mounts Simone and Simoncello, two mountains of calcareous rock with flat summits, and by the fascinating 'calanchi' gullies found especially in the Tuscan section of the area. On the summit of Sasso Simone and Simoncello, evidence of human presence dating to the Bronze Age have been found. In the plain under Sasso Simone, shortly after the year one thousand, the Benedictine Abbey of Sant'Angelo was erected. Towards the mid-fifteenth century, Malatesta di Sestino ordered the construction of a fortified castle, and in the sixteenth century, the Medici of Florence ordered the construction of a civil military settlement. Stretches of walls and of paved roads, and the remains of a cistern are still visible though mostly covered by vegetation The area includes extensive wooded areas and lands used for semi-free ranging pasture, which were once also cultivated for cereals and potatoes. Particularly interesting is a forest of Turkish oaks, considered one of the largest of Europe. In general, woods cover more than half the area, and are mainly aged coppices, in which the Turkish oak (*Quercus cerris*) is the predominant species. Traditionally, woods was used for firewood by local populations. However, in the last 30–40 years, the declining demand of firewood and the inclusion of the land in the Italian state's military lands, have caused an alteration Besides the centuries-old Turkish-oak forest, there are also recent woods, grown in the last 40–50 years, after the land was acquires by the Italian state and the more marginal areas were abandoned. Other areas instead are pastures and scrubland, the latter a result of the abandoning of lands previously used for crops or pasture. The use of meadows and plains for pasture was historically a fundamental aspect of the local economy.

Fig. 15.7 The unique landscape of Sasso Simone and Simoncello

The area, also thanks to being owned by the state, retains a good degree of integrity, but the abandoning of pastures and agricultural activities has led to the spread of wooded areas. The silvocultural interventions listed in the recent Plan for the Management of the Mountain Community concern especially the Turkish-oak woods and call for pruning and mowing of the undergrowth. It would however be necessary to intervene also on a number of aged oaks. Pasture continues to be practiced in open areas, though less than in the past. The Sasso Simone e Simoncello Natural Regional Park has recently taken a number of steps aimed at preserving pastures and supporting free range grazing for the production of quality meat.

The area has a certain degree of vulnerability, especially in terms of depopulation, which has led, in the last 50 years, to the spreading of woods over what used to be crop fields and pastures, environments that are very important for the territorial balance of the area and for biodiversity. If measures are not taken, the prairies will be gradually replaced by scrubland first and then by woods. Prairies are also an essential habitat for birds, which need vast open spaces, and benefit also pastures and from marginal agricultural activities (Fig. 15.7).

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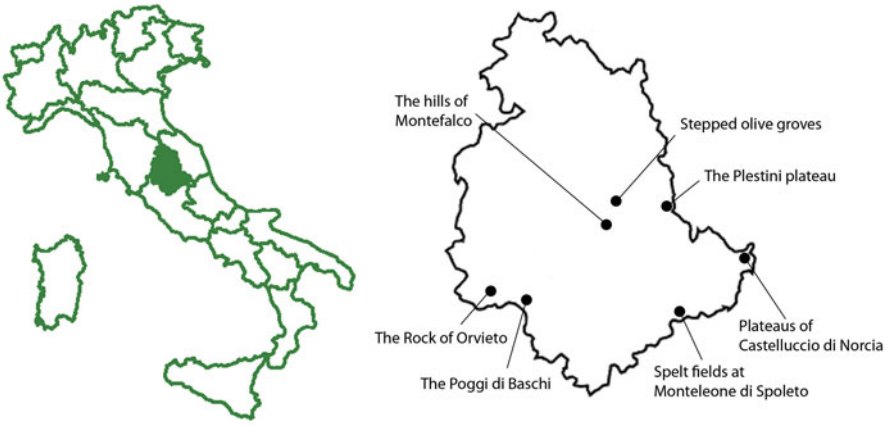
Chapter 16
Umbria

Piero Bevilacqua



16.1 Introduction

Along with Tuscany and Marche, Umbria has long epitomized the historical features of the Italian *bel paesaggio*. Its landscape is characterized by a variety of crops, remarkable field shapes, particular ways of marking property limits, enclosures and terraces, houses scattered throughout the countryside, and an ordered alternation of pastures, woods, fields, and mixed orchards. Today, many of the fundamental historical characters of the Umbrian *bel paesaggio* have been altered. The abandonment of mountain areas and consequent demographic decline is responsible for the most evident imbalances. The forest is expanding, or, more often, a straggly shrubbery, which gradually takes over pastures and the old olive groves. Forty-six percent of the region is covered by woods and 43.4 % by agricultural land, of which only 22.6 % is pastureland.

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But the really dramatic changes have occurred in the plains of the Valle Umbra, the Valnerina, and the middle Tiber valley. Here industrial agriculture, town expansion, the flourishing of small and middle-sized manufacturing businesses, and the growth of the road network and infrastructure have swept away the historical agrarian landscape of Umbria. Peasant polyculture has disappeared from the scene, as have treed fields, vineyards with vines trained on maples, and various types of earth-retaining structures, such as walls, hedges, terraces, etc. The historical slope contour shrub cultivation has given way to mechanized agriculture, accelerating soil erosion; a centuries-old phenomenon that has been a concern in the region ever since ancient Roman times. The landscape has undergone a simplification determined by a trend to specialization favoring the expansion of wine and olive-growing, especially in the Valnerina and the foothills. However, significant traditional agricultures still live on. An exemplary testimony is an area with stepped olive groves extending between Spoleto and Assisi, included in the present catalogue, and the hills of Montefalco, dominated by mixed cultivation with a prevalence of grapevine, especially of the Sagrantino variety. In the plains and valleys, the simplification of the landscape emphasizes bare arables with a prevalence of monocultures, including irrigated crops such as maize or tobacco. Our choice of the Orvieto Rock and the Poggi di Baschi is meant to illustrate the mixed cultivation of grapevine and olive trees. We find that these areas are an exemplary survival of the Italian *bel paesaggio*.

We chose Monteleone di Spoleto because it still preserves an ancient genetic heirloom, that of spelt. Its cultivation in small fields at the foot of the town, which is crowned by wooded mountains, gives the whole area a singular charm. The Piani di Castelluccio di Norcia are unique in the Umbrian hill country. Situated on the Tyrrhenian versant of the Sibillini Mountains, the Castelluccio basin extends over about 2,000 ha. Its open-field system originates from thousands of years of communal land use. The most distinctive crop in the area is the local lentil, distinguished with a PGI (Protected Geographical Indication) designation. As to the Altipiani Plesitini, they epitomize the history of the agro-pastoral civilizations of the Apennines. Here the typical crops are, again, the lentil—a less prized variety than that of Castelluccio, but nevertheless fetching high market prices—and the red potato. The area's pastoral economy, which still retains traces of traditional practices, has developed good processing and selling infrastructures.

16.2 The Plestini Plateaus (43° 01′ 35″ N; 12° 53′ 24″ E)

This polyculture landscape extends over about 1,700 ha in the Colfiorito area, at altitudes between 750 and 800 m a.s.l., in the municipalities of Foligno in the province of Perugia and Serravalle di Chienti in the province of Macerata. The land is mainly privately owned. The area lies within the Colfiorito Regional Park and is included in two SCI (Piani di Annifo-Arvello, Piani di Ricciano). It is also subjected

to landscape restrictions as per laws 1497/39 and 431/85. The town of Colfiorito can be reached from Foligno by driving along the SS 77 towards the border with Marche. Hemmed in by the calcareous ridges of the Umbria-Marche Apennines, whose highest peak is Mount Pennino (1,571 m), the Colfiorito plateaus are a system of seven karstic hollows (Colle Croce, Annifo, Arvello, Colfiorito, Palude, Cesi and Popola, Ricciano) with a geological substratum of alluvial origin. These hollows are the bottoms of ancient lakes whose drying up was partly naturally, but mostly the result of Giulio Cesare Varano's excavation of the *Botte dei Varano* in 1843.

The area owes its significance to its fascinating landscape, characterized by the persistence of agricultural and forage polycultures with remote historical origins on plateaus lying in a prevalently mountainous district; a landscape that faithfully reflects the history of the pastoral-agricultural cultures of the Apennines. Human presence on the plateaus is a logical consequence of the area's geographical position. Colfiorito lay at the intersection of the most important routes across the central Apennines. Forts called *castellieri*, usually circular in plan and consisting of earthworks and wooden palisades, stood in lofty positions whose natural defenses were exploited and reinforced by man. The most important was the *castelliere* of Monte Orve (sixth century B.C.). The Plestini plateaus were already inhabited and farmed by the ancient Romans. Indeed, their name comes from the Roman town of Plestia, first attested in 178 B.C. The agrarian landscape is characterized by traditional cultivation of grain and forage, and especially lentil and red potato. The latter is not autochthonous, being an import from the Netherlands (*Solanum tuberosum* cultivar *desirée*), but has acclimated ideally to the pedoclimatic conditions of the plateaus. Another important crop is the lentil, a less prized variety than that of Castelluccio di Norcia, but nevertheless fetching good market prices. Both the lentils and the red potatoes of Colfiorito are included in the list of Traditional Agroalimentary products of the Ministry of Agricultural, Food and Forest Politics. The plateaus of Annifo, Arvello and Ricciano are more similar to one another. Along their edges are hedges and continuous rows of trees, or isolated trees. Due to the absence of fences, walls or hedges between plots, reflecting the original collective use of the land, these plateaus have a very special open-field landscape. Humid meadows in the innermost zones of the plateaus give the landscape a certain chromatic and formal homogeneity, while field geometry and crop patterns tend to become more fragmented as one moves outward towards the edges. The landscape of the Colle Croce plateau is especially unusual, being almost entirely covered today by a regular grid of ploughed fields crossed by a perfectly straight road without trees. Here the field grid has a typical radial grid with ample cultivated wedges. Reforested areas are easily recognizable by their regular plans, which stand out sharply along the cultivated slopes.

The landscape still retains a certain degree of integrity, although there have recently been some changes in crops. The low market value of traditional crops has led to their reduction and the best soils have been set aside for particular crops produced for local or specialist markets. The local lentils, in particular, have

Fig. 16.1 The landscape of the Plestini plateaus

special organoleptic characteristics that make them much in demand of local as well as external markets, at prices higher than lentils from other areas. The principal sector of the local agricultural economy, however, is still animal husbandry. Good milk production and commercialization facilities have allowed the survival of many family-owned cattle farms, as well as the creation of larger and more efficient farms. The herbaceous surface is exploited in two ways, for mown grass fields and for pastures. This system does not alter the vegetable cover, as it has been part of the local ecosystem for centuries and contributes to regulating its balance. There are still many rural homes in the area. These are of two types: those lying east of the Topino river, of the "slope" type, usually grouped, with the barn either outside the village or adjacent to the house, or even incorporated in the house; and those west of the Topino, which are of various types, scattered, and with separate barns.

The vulnerability of this historical landscape prevalently resides in the risk that traditional agricultural activities will be abandoned. Both agriculture and animal husbandry are declining, due to their economic marginality in world markets. Excessive grazing, on the other hand, has a negative impact on the vegetation. By staying on the best pastures and avoiding the others, grazing animals are encouraging the spread of plants with low nutritional value. The shift to specialized crops has partially made up for land abandonment, but low production yields still threaten to cause a large-scale

abandonment of this countryside. As regards the red potato and the lentil, the lack of adequate control allows inferior produce to be introduced from other areas, with strongly negative repercussions both on the economy and on food quality. Factory buildings, especially those of the dairy industry the area is famous for, and temporary post-earthquake settlements are the main new features of the present landscape (Fig. 16.1).

16.3 Spelt Fields at Monteleone di Spoleto (42° 39′ 02″ N; 12° 56′ 51″ E)

The spelt fields of Monteleone di Spoleto lie in the homonymous municipality in the province of Perugia. They extend over approximately 500 ha at altitudes ranging between 700 and 1,000 m a.s.l. The land is mostly privately owned and placed under partial landscape restrictions as per Law 431/85. The town of Monteleone di Spoleto lies on a 978 m tall hill along the SS 471 from Cascia to Leonessa, at the end of the Corno valley, northeast of Mount Terminillo. The geological substratum is partially constituted of recently formed detritus and conoids, and partially by red and white marly limestone, well stratified, with red and gray flint and intercalated strata and banks of subcrystalline white limestone. The area has a gentle morphology with low hills, but is surrounded by much higher rises.

The local landscape owes its significance to the historical persistence of the cultivation of spelt, which dates all the way back to the Roman period. The crop is grown in fields delimited by hedges, a distinctive landscape feature reflecting specific local forms of land management. The area is mainly mountainous (82 % of the total 61 sq km), with limited hilly zones (12 %) and very small agricultural areas (2 %). The small fields are the result of a relationship between human beings and the local environment that goes back thousands of years.

The area is part of the vast Valnerina district, which extends from Terni to the Sibillini mountains, and is crossed by the Nera river. Monteleone has always been a very important natural intersection of major routes from the north (Ponte, Norcia), the west (Spoleto), the south (Leonessa) and the east (Salaria, Valle del Tronto). An Etruscan *biga* was fortuitously discovered in the area. This ancient bronze and walnut carriage dating from the sixth century B.C., a jewel of the local archaeological heritage, is presently in the Metropolitan Museum of New York. It bears witness to the importance of Monteleone ever since protohistoric times, when it was known as *Brufa*. Spelt cultivation was spread by the Romans all over the Italian peninsula, since the crop is resistant to diseases and thrives even on arid soils. It is commonly assumed that its cultivation has gone on uninterrupted in the Monteleone area ever since antiquity. The importance of the crop in the area is also reflected in local religious ceremonies. On December 5, on the eve of the festival of the patron saint of Monteleone (Saint Nicholas of Bari), the parson assembles the population to share out among them a soup of blessed spelt. This ritual does not celebrate

Fig. 16.2 Monteleone di Spoleto

extraordinary wealth and abundance, or imply the sacrifice of something valuable to be shared out; rather, it is a symbol of the equality of members of the community. In the past, spelt was sown at the end of a stubble-field cycle, or even several, or else in regular alternation with pasture rests. Today, instead, the crop only has a marginal role in the fallow cycle. Sometimes it is sown after medicinal herbs. Chemical weeding is never employed in the fields: here spelt is grown according to the principles of biological agriculture. Depending on altitude, spelt is harvested between the second half of July and the first half of August. A decree of the Ministero delle Politiche Agricole, Alimentari e Forestali, issued on 21 May 2007 (G.U. n.124, 30 May 2007), has started a procedure for the granting of PDO (Protected Designation of Origin) recognition for Monteleone Spelt. In spite of the limited expanse of farmland, fruit trees such as almonds and walnuts are also grown in the area, as well as herbaceous crops and pulses (beans, chickpeas, broad beans, and chickling vetch; the latter are recognized by the Ministero delle Politiche Agricole, Alimentari e Forestali as Traditional Agroalimentary Products). There is also a significant production of black truffles, also listed among Traditional Agroalimentary Products. Because of its mountainous and hilly morphology, the area has always been especially suitable for animal husbandry, an activity in which part of the population is engaged.

The integrity of the spelt field landscape is still very good. Indeed, a slight decline some time ago was followed by a new increase. While a decade ago the surface involved was ca. 25–30 ha, today its extension is around 140 ha. All this in spite of the precipitous drop of the population employed in agriculture (the resident population has halved over the last 50 years). Grain is also still grown over ca. 250 ha. The fields are still separated just by hedges and trees, no fences. They lie in the valley below the town, while woods cover the slopes of the surrounding mountains. This makes the landscape homogeneous and especially pleasing to the sight. There has been a remarkable increase in forage species. Unfortunately, instead, mixed vineyards only survive in very few places, especially at higher altitudes, up to 1,000 m a.s.l. Animal husbandry is also recovering. There has been a significant increase in sheep and cattle, especially cows, whose milk is sold to the local dairy factories.

The main vulnerability of the Monteleone landscape is the high average age of farmers. Because of this, there is a real risk that the fields will eventually be abandoned. This actually already happened in the past when sharecropper agreements, which played such an important role in the construction of the *bel paesaggio* of the Umbrian countryside, came to an end and many young people were hence driven to look for jobs outside agriculture. In spite of the presence of eight biological farms and six being converted to biological methods, there is a strong risk that intensive agriculture will take over, radically changing the landscape. Abandonment, whose results are often clearly perceivable, has been partially compensated by the intensification of the growing of specialized crops (Fig. 16.2).

16.4 The Hills of Montefalco (42° 53′ 31″ N; 12° 39′ 12″ E)

The historical agricultural landscape of the hills of Montefalco extends over ca. 570 ha around the town of Montefalco in the province of Perugia. The land is mostly privately owned, with altitudes between 200 and 500 m a.s.l. The area is partially under landscape restrictions as per Laws 1497/39 and 431/85. It can be reached by taking the SS 75 from Perugia to Foligno, and from here the SP 443 to Bevagna, and then driving on into the municipality of Montefalco. The hills are mainly composed of sediments of Villafranchian origin dating from the Lower Pleistocene, sandy and clayish-sandy, sometimes with arenaceous conglomerates; these have largely been removed, and the slopes are hence very gentle.

The landscape owes its significance to the historical persistence of an elaborate agroforestal mosaic and high property fragmentation, which have characterized the area, although not always in the same forms, for several centuries. At the edges of woods, olive groves form regular but discontinuous plots near inhabited centers. On cultivated hill slopes one notices reforested patches of cherry trees. To the north, on the hills declining towards the Valle Umbra, in the Montefalco area, vineyards become more frequent, although they remain small. Here, too, the main cultivar is

Fig. 16.3 The olive orchards of the Montefalco landscape

the olive. The trees are still grown in scattered patterns. Rows of mulberry trees as well as other species on which vines are trained put a distinctive stamp on the landscape, remindful of the typical sharecropping landscapes with trees of Tuscany, Umbria and Marche. The growing of grapevine trained on trees dates back to the Roman period, a vestige of which in this area is the western stretch of the course of the Flaminia consular road. It is along this road that the first foothill settlements sprang up. Another stretch of the course of the Flaminia runs west of the Martani mountain range, marking the border between the territory of Spoleto and that of Todi, and connecting the two at the same time. The present-day Via del Monte follows the course of the ancient road. The spread of arboreal cultures, especially vineyards, has increased the importance of the local landscape, and is now also drawing tourists. In the local vineyards one of the most prized vintages in Italy is grown, the Sagrantino, which provides the background to the enogastronomic route of the Strada del Sagrantino. The area produces several wines, including the DOC (Controlled Origin Denomination) "Colli Martani" and the DOCG (Controlled and Guaranteed Origin Denomination) "Montefalco Sagrantino", both dry and sweet, as well as the PDO (Protected Designation of Origin) "Umbria" extra virgin oil.

The landscape of the hills of Montefalco is still quite intact, with its diverse mosaic of crops. Near hill settlements such as Montefalco itself, surrounded by historical olive groves, new specialized vineyard surfaces have been taking over increasingly extensive spaces on hill slopes, jeopardizing the quality of the

landscape. Nevertheless, wine-growing in its more traditional forms, and especially olive-growing, still retain their importance. In the western hills, and not just within the selected area, there are a number of residences in panoramic positions on hill summits, including many in the municipalities of Castel Ritaldi and Montefalco (Palazzo Parenti, Casa San Quirico, Villa Angelici, Casina Belvedere, Villa Antonelli). These buildings constitute an important historical and cultural heritage.

The main threat to the local landscape, which is characterized by a great variety of its crops, is a trend towards simplification. This is occurring especially as a result of intensification, especially in vineyards, while the olive groves still retain their traditional tree layouts. From the 1950s onward, industrial and intensive cultivations have been gradually replacing the traditional treed landscape, forming a dense mosaic delineated by hedges and rows of trees. In this changed countryside, the signs of historical roads and Roman centuriation are no longer easily recognizable. The growth of wine production has led to the replacement of historical cultivation systems with highly mechanized ones; a problem the area shares with many other Italian wine-growing districts (Figs. 16.3, 16.4).

Land use 2008	Surface (ha)	Surface (%)
Urban area and courtyard	142.85	11.95
Shrubland	8.45	0.71
Mixed broad-leaved forest	81.26	6.80
Arboricolture	14.65	1.22
Unproductive	0.56	0.05
Fallow	36.49	3.05
Vegetable garden	6.52	0.55
Arable land	228.69	19.12
Arable land with tree	1.15	0.10
Arable land with olive tree	79.50	6.65
Arable land with vine	2.07	0.17
Arable land with vine and tree	1.38	0.12
Arable land with vine and olive tree	2.74	0.23
Olive grove	443.07	37.05
Vineyard	140.65	11.76
Wedded vine (vineyard with tree used as support)	0.10	0.01
Vine with tree	1.42	0.12
Vine with olive tree	4.27	0.36

Evaluating indices of landscape	
Number of land uses	18
Number of patches	1427
Total surface area (ha)	1195.81
Average surface area of patches (ha)	0.84
Average surface area of arable land patches (ha)	0.85
Hill's diversity number	6.35
Class of landscape integrity (I–VI)	III

Fig. 16.4 The landscape of Montefalco owes its significance to the historical persistence of a complex mosaic and a high property fragmentation. The olive orchards are the first category of land use (37 %), followed by arable land (19 %) and vineyards (12 %). The landscape mosaic is highly fragmented with a large number of patches having a small average size (0.85 ha). Overall, the historical landscape is quite intact, thanks to the persistence of mixed crops

16.5 Plateaus of Castelluccio di Norcia (42° 49′ 21″ N; 13° 12′ 54″ E)

This mainly privately owned pasture and field landscape extends over ca. 2,000 ha in the municipalities of Foligno and Nocera Umbra, in the province of Perugia, on the Tyrrhenian versant of the Sibillini Mountains at an altitude of 1,350 m a.s.l. It is partially included within protected zones: in the Monti Sibillini National Park, and in the SCI (Site of Community Importance) and SPA (Special Protection Area) Molti Sibillini. The area forms the watershed of the Umbrian-Marchigian Apennines, between the communes of Foligno and Serravalle di Chienti. It can be reached from Foligno by the Val di Chienti State Road (SS 77), over the Colfiorito pass and driving for another 9 km from Serravalle.

The Castelluccio basin, with its ca. 2,000 ha, is the most significant manifestation of karstification in the Monti Sibillini, and is second in Italy only to the Fucino basin. This area, originally a lake, is a *polje*, a depression resulting from tectonic sinking. It includes two swallow holes in the Piano Grande—the first of which, under Monte Castello, drains the waters of the Fosso dei Mèrgani—and a third in the Piano dei Pantani. The local small rounded hills called *humi* are also the result of modeling by water. On one of them is the settlement of Castelluccio (1,452 m).

The area owes its significance to its captivating scenery, made up of calcareous mountains with centuries-old fields and vast pastures. The fields are marked out from one end to the other of the plateaus. They are divided into *quarti*, *cinquine* and *decine*, a system dating back to land parceling carried out in 1346, which involved the whole area, except the *Bandita* and the *fida*, pasture zones which remained available for common use. Since its use was originally collective, the agrarian landscape appears as a charming system of open fields. There are no fences, hedges, walls, or any other landmark separating the plots. Another aspect that gives the landscape a distinctive quality is its lack of trees, except for some small patches along the mountainsides. Both the decline of commons from the sixteenth century onward and the commune of Castelluccio's sale of large land parcels after the Unity of Italy to pay back debts triggered a rush to privatization and appropriation. This, however, did not modify the open field system. The most distinctive crop in the area is the local lentil, which obtained PGI (Protected Geographical Indication) designation in 1999. The flowering (*fiorita*) of lentils in the whole Piano Grande, but especially in the area around Mèrgani, is a phenomenon of great beauty. The view of the plateau graced with bright and changing colors for a few weeks leaves a lasting impression on whoever had the fortune to enjoy it. The period of the *fiorita* varies slightly with climate fluctuations. In any case, it occurs between the last days of May and the end of June. The area shows different degrees of anthropization that are easily distinguishable. On the summit are meadows and pastures belonging to large landowners, or under common rights of use dating back to the Middle Ages, known as *comunanze agrarie*. In spite of the crisis of sheep and cattle farming, which has led to gradual depopulation of the area, many Castelluccio shepherds continue to practice transhumance. They no longer walk to their destinations, however, but use trailer trucks. Patches of beech woods still survive on the surrounding slopes. The

Fig. 16.5 Its denuded appearance is a valuable scenic feature of this landscape dating back to the fourteenth century

Land use 2008	Surface (ha)	Surface (%)
Urban area and courtyard	7.59	0.42
Beech forest	1.23	0.07
Fallow	0.84	0.05
Pasture	1062.95	58.81
Afforestation of Austrian pine	1.43	0.08
Arable land	733.44	40.58
Total	*1807.48*	*100.00*

Evaluating indices of landscape	
Number of land uses	6
Number of patches	938
Total surface area (ha)	1807.48
Average surface area of patches (ha)	1.93
Average surface area of arable landpatches (ha)	0.87
Average surface area of pasture patches (ha)	12.08
Hill's diversity number	2.04
Class of landscape integrity (I–VI)	VI

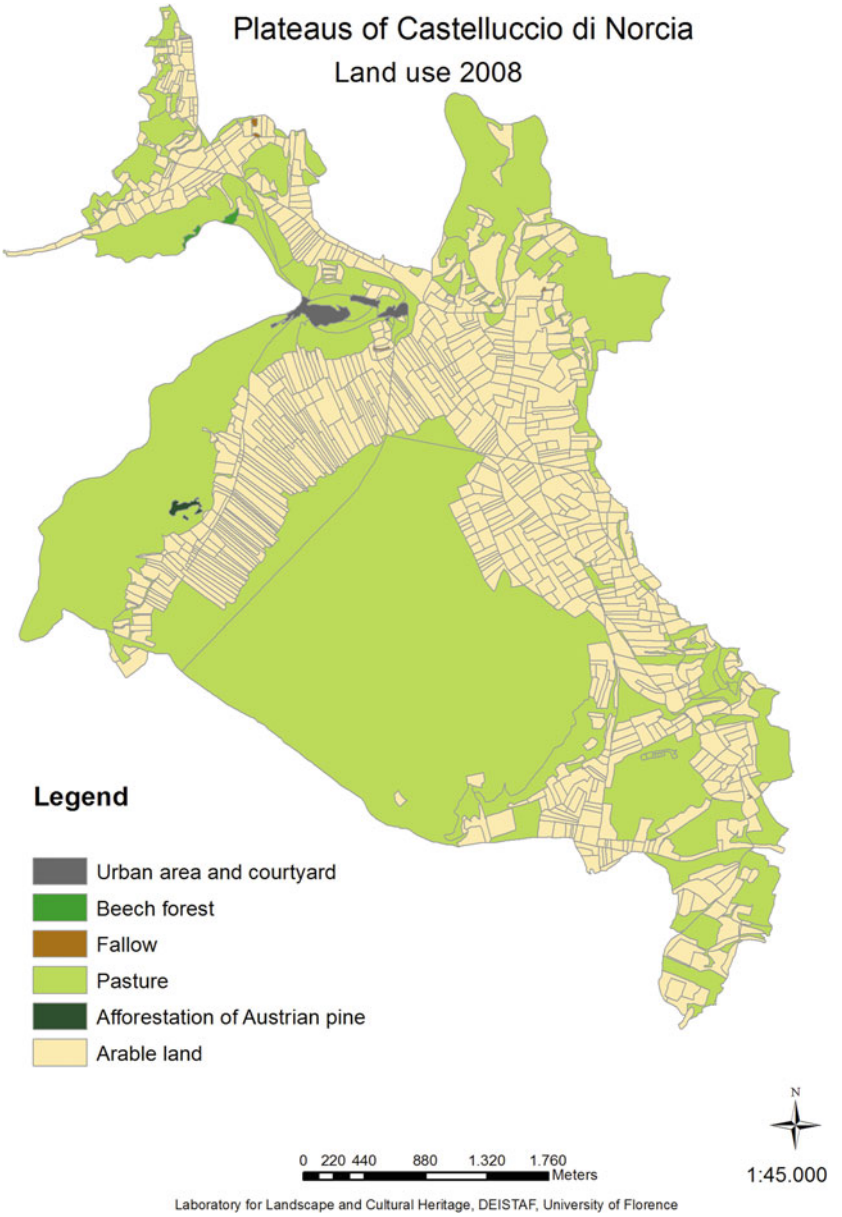

Fig. 16.6 The Plateaus of Castelluccio di Norcia shows large areas of pasture (58.8 %) and arable land (40 %) once characterized by a collective use, but today largely private, although still retaining most of their historical landscape features. Due to its collective use origin, the agrarian landscape appears as a charming system of open fields, with no fences, hedges, tree rows stone walls, or any other landmark separating the plots. The agrarian mosaic is composed by a large number of small sized patches (0.87 ha), resulting from the historical land parceling, today almost all devoted to the production of lentils. Pastures show an average size of patches of about 12 ha. The historical landscape has a high level of integrity, characterized by the absence of woodlands, but the advance of the forest onto the denudated slopes threatens to drastically change its features. The possibility to preserve this landscape will also depend on the policy carried out of by the Sibillini Park, in which the area is included

beech groves of Val Cànatra are especially renowned. Still, woods are a secondary feature of the area.

The local landscape appears quite intact, retaining all of its denudated allure. An attempt to reforest the mountain slopes has been carried out. Here, as all over the Apennines, black pine was used. These trees usually do not blend well into the landscape, being non-autochthonous and planted in rigid geometric patterns. The agricultural production of the Castelluccio di Norcia plateaus was once much more diversified. Today lentil, a significant source of income thanks to its PGI designation, has largely replaced most traditional crops. Two toll roads, still bearing the local name, survive in the area: The *Dogana*, that crosses Pian Piccolo, and *Doganella*, which from the Prata (under the present Poggio di Croce) goes across the Pian Perduto to Palazzo Borghese, marking the border between Umbria and Marche.

The area derives its vulnerability from several causes. The restrictions imposed by the Monti Sibillini Park to safeguard the area's magnificent landscape inevitably leads to friction with the few farmers left, who complain of huge difficulties in continuing cultivation. Notably, the scarcity of roads and the Park-imposed prohibition to cross the fields with mechanical vehicles makes it impossible for many farmers to maintain a full regime of cultivation in the holdings at the edges of the plateaus, at the foot of the surrounding mountains. Furthermore, the advance of the forest onto the denudated slopes threatens to drastically change the landscape. The growth of tourism in the area has led to the imposing of restrictions of access to parts of the plateaus to limit flower picking and humus collecting (Figs. 16.5, 16.6).

16.6 The Poggi di Baschi (42° 40′ 33″ N; 12° 13′ 08″ E)

The polycultural landscape of the Poggi di Baschi lies in the municipalities of Baschi and Montecchio, in the province of Terni. It extends over ca. 1,500 ha in the area between the two communes and the sub-municipality of Civitella del Lago, at altitudes between 150 and 450 m a.s.l., on privately owned land. The area is included in the Parco Regionale del Fiume Tevere, the Valle del Tevere SPA (Special Protection Area), and the Valle Pasquarella SCI (Sites of Community Importance). It is also placed under landscape restrictions as per Laws 1497/39 and 431/85. The settlement of Baschi lies at 165 m a.s.l. on an arenaceous spur lapped by the Tiber, a few kilometers from Orvieto, along the SS 205 and A1 (Orvieto exit). The Poggi can be reached from Baschi by local roads leading to Montecchio and Civitella del Lago. They are prevalently formed of grayish or light bluish clays and sandy clays of Pliocenic origin, with a very small content of material of volcanic origin and weakly cohesive yellow sands alternating with flat pebbles. The Poggi hills are gentle, while the surrounding areas are either level or much craggier.

The Poggi are a significant fragment of the Umbrian *bel paesaggio*, formed over the century through the action of man. The landscape is dominated by hill agriculture, with an alternation of herbaceous fields, arables and maquis. The area is remarkable for the antiquity of its wine and olive-growing, as well as that of its small vegetable gardens, and for its old rural buildings, now largely converted into holiday

homes or holiday farmhouses. Sharecropper pacts have also put a clear stamp on the landscape. In fact, the *poggi* epitomize an agriculture characterized by property fragmentation and a long tradition of high-value crops. Animal husbandry is limited to self-consumption or the local market. Equally evident is the overall homogeneity of the *poggi* compared to the surrounding areas. There is a strong visual contrast between the level areas, mostly lying immediately above the Tiber, precipitous limestone cliffs of gullies such as that of Forello—once inaccessible, today crossed by the Todi-Baschi road—and the long and impervious river valleys crisscrossed by mule tracks. The *poggi* lie in a district known for its long history. It was first under the Etruscans, then the Romans (as attested by the *Fragmentum Tudertinum*, found in 1719 in the Molinaccio area) and the Goths. The archaeological remains of the port of Pagliano provide direct evidence of Roman influence. The present name of the town is believed to derive from the Latin *vasculum* (a diminutive of *vas*, basin). The town and its inhabitants were originally called "Vasculi", whence "Vaschi" and finally "Baschi". Human work always played an important role in determining the harmonious landscape of the *poggi*. Here the areas most suitable for plowing and mechanized agriculture, with their extensive fields of grain, sunflowers and forage grass, alternate with vineyards and olive groves, as well as mixed fruit orchards and vegetable gardens. The scarcity of woods is partially due to centuries of conversion to olive groves, a cultivation that blends in well with the area's natural landscape. The *poggi* produce an oil distinguished by the "Umbria" PDO (Protected Designation of Origin) denomination, remarkable for its quality rather than its quantity. Vines trained on trees have given way to specialized vineyards producing red wines mainly from Cabernet Sauvignon, Merlot, Pinot Nero and Sangiovese grapes. These wines obtained DOC (Controlled Origin Denomination) recognition in 1998 under the designation "Lago di Corbara". Around the *poggi*, the most widespread woods are of holm oak, especially in the gully area. Chestnut woods are found on lower slopes. The commune of Baschi, along with those of Avigliano Umbro and Montecchio, has recently promoted the founding of an association of chestnut producers, the "Associazione Produttori della Castagna della Comunità Montana Croce di Serra".

The integrity of the Poggi landscape remains high, partially thanks to some initiatives that have helped to preserve the continuity of agricultural activities. Due to the area's very high property fragmentation—the average farm size barely reaches 3.5 ha—and the area's function as a labor reserve for the industrial area of Terni-Narni, a lot of agricultural work here is performed on a part-time basis. Due to their smallness, however, the holdings do not need continuous maintenance, and this flexibility has allowed local farmers to keep up the cultivation of their high-yield crops even without a full-time commitment. Hence the widespread recourse to the so-called *mezze forze* (young people, women, the elderly), an essential resource for local rural families. Part-time olive farming, however, is the result of different socio-economic dynamics: in the first place, an ability to exploit secondary work forces thanks to the enduring of the traditional rural family business model; secondly, loyalty to family tradition.

As long as the part-time farming system survives, and as long as the older farmers' their attachment to the land overweighs other factors, the vulnerability of traditional

Fig. 16.6 The polycultural landscape of Poggi di Baschi

landscape of the Poggi di Baschi will probably remain low. When these conditions cease to obtain, however, the "abandonment landscape" will encroach—as it has already begun to do—on marginal, no longer cultivated land, and the traditional landscape will hence be lost. Finally, the conversion of old rural buildings to second homes or holiday farmhouses also poses a risk to the landscape, when this is done, as is often the case, without taking care to employ traditional architectural designs and materials. Traditional building types are thus destroyed to give way to new ones that clash with the harmony of the landscape (Fig. 16.6).

16.7 The Rock of Orvieto (42° 42′ 35″ N; 12° 06′ 34″ E)

The Rock of Orvieto is located in southern Umbria, in the Province of Terni, at the meeting point of the territories of three different regions: Umbria, Lazio and Toscana. The area under consideration here extends over ca. 500 ha at altitudes between 120 and 325 m a.s.l. The land is mostly privately owned, but under landscape restrictions as per Law 1497/39. Orvieto can be reached by leaving the A1 at the homonymous exit. The base of the Rock is constituted by Pliocenic clays. Between them and the above-lying tuff rock is the "Albornoz series", a thin (10–15 mm) multilayer, not visible everywhere. The Rock itself is composed of two main *facies*: tuff, which gives the local landscape a very distinctive character, and pozzolana.

The Orvieto Rock owes its significance to the historical persistence of a high-quality agriculture which, combined with the place's distinctive morphology, results in a unique and aesthetically remarkable landscape. The local farming landscape

is dominated by vineyards yielding quality wine. Indeed, DOC (Controlled Origin Denomination) "Orvieto" wine is one of the best known Italian wines in the world. Alone, it accounts for three quarters of the whole DOC wine production of Umbria. DOC "Orvieto" includes "Orvieto Classico", from the area of the Rock itself, and "Orvieto", from the surrounding areas. There are also sizable olive groves producing the PDO (Protected Designation of Origin) "Umbria" oil. The area is especially significant for the harmonious way in which its agrarian landscape evolved, and also for how it managed to preserve its homogeneity in spite of its proximity to such an important urban center. In the past, sharecropping was the most suitable farming contract for the type of agriculture practiced in the area. Its widespread adoption helped to give the slopes of the Rock their homogeneous, if fragmented, appearance. These slopes, with the surrounding valleys and hills, have always been the main resource of Orvieto's almost exclusively agricultural economy. The town itself at the top of the Rock, in spite of its strong connections with agricultural life, cannot itself be regarded as part of the agrarian landscape. Its original raison d'être was primarily defensive. After the Romans devastated the splendid Etruscan town of *Velzna* (which they called *Volsinii*), it went through a period of decline. It stood far away from the main trading routes, and its lofty position had lost its usefulness in what were now times of peace and security. Orvieto reached the peak of its splendor in the Middle Ages, when palazzi and sacred buildings were erected, including the famous Cathedral in 1263. The cessation of sharecropping pacts resulted in a gradual increase of holding sizes, especially of those in the class between 5 and 25 ha. The harmonious blending of the town and farm areas is ensured by small wooded areas descending from the tuffaceous spur down toward the valley, also including plant species that are not originally from the area. There are no walls between estates, just bushes, hedges and trees. Small and middle-sized cultivated plots go up the slopes all the way to the town limits. Human work has played an evident role in maintaining the integrity of the landscape. There are some noticeable differences in land use, especially on the south side of the Rock. This area, called Cannicella, was and is favored by its southern exposure and easy accessibility. It is used exclusively for agriculture: prevalently vegetable gardens and orchards, interspersed with small vineyards and olive groves.

The landscape still retains its integrity thanks to the persistence of traditional farming. A quality wine production, while it ensures partial protection against abandonment, may also lead to an excessive intensification of farming, compromising a landscape's integrity. This, however, does not seem to have occurred on the Orvieto Rock. Here viticulture, in spite of its high yields, has kept the town from expanding onto farmland. Not requiring a constant work input, olive-growing has remained stable. Part-time workers are employed to gather the olives. Traditional fruit and vegetables are grown in some plots, especially the smaller ones.

As regards vulnerability, the main threat to the traditional landscape of the Orvieto Rock is erosion. This occurs more frequently along slopes that are no longer farmed. The sustaining of the cultivation of local crops is thus a fundamental prerequisite for soil preservation. Furthermore, the high average age of farmers, along with the lack of a policy for the support of part-time work in the olive groves, threatens to favor the spread of intensive agriculture, and hence cause drastic changes in the landscape.

Fig. 16.7 Geomorphological and settlement features contribute to the uniqueness of the landscape of the Rupe di Orvieto

Finally, the area's strong tourist vocation is encouraging the abandonment of rural homes with their land, many of which have been converted into second homes and holiday farmhouses (Fig. 16.7).

16.8 Stepped Olive Groves (42° 55′ 57″ N; 12° 45′ 16″ E)

The area between Spello and Spoleto epitomizes the stepped olive grove landscape found along the hilly range between Assisi and Spoleto. It extends over ca. 1,450 ha in the municipalities of Spello, Foligno, Trevi, Campello sul Clitunno and Spoleto, in the province of Perugia. The olive groves lie at altitudes between 200 and 600 m a.s.l. They are privately owned, but partly under landscape restrictions as per laws 1497/39 and 431/85. They can be reached by the SS 3, which runs from north to south along the base of the Assisi-Spoleto hill range. From the SS 3 many roads branch off towards the olive-covered hills. The Assisi-Spoleto range is part of the foothills of the Umbria-Marche Apennines. It extends from Mount Serano to Mount Subasio

(the "mountain of Assisi"). Its soils are formed of Rhenish-type ground-down supra-Cretaceous limestone, or azonal brown earth deriving from the alteration of marly limestone. These soils have a good structure and are quite fertile. There are also some very steep southward-looking carbonaceous versants with emerging rock.

The area owes its significance to the historical persistence of a crop typical for Umbria, which has strongly characterized the whole regional landscape for many centuries, partially thanks to human remodeling of the versants. The Assisi-Spoleto range is one of the areas in Umbria that has the strongest vocation for olive-growing. The landscape is dominated by a continuous strip of olive groves which has been constantly expanding upward from the valley bottom at the expense of the forest. The growing of olive trees on steep terrain is made possible by irregular terraces. On especially steep slopes, the usual contour terraces are replaced by *terrazzamenti* and *lunette*, made by building dry-stone walls from stones gathered on the spot and filling in the resulting space with earth. These terraces help to limit surface erosion. Since the layout of most of the olive groves is irregular, the landscape of the Spoleto-Assisi range remains diverse in spite of the dominance of a single crop. Regularly spaced groves, instead, usually stand on *lunette* with trees that are centuries old. Both layouts thus have especially significant landscape-historical characteristics. The earliest olive groves bear witness to an intense relationship between human beings and the countryside going all the way back to the Roman imperial period. Examples include the monumental olive grove of Sant'Emiliano a Bovara di Trevi and an olive grove at Paradiso di Pianciano (near Spoleto) As Desplanques commented, this range features "olive trees on terraces (. . .) testimonies of an ancient landscape". Another significant historical testimony are locally preserved vestiges of the course of the ancient Flaminia consular road. There is also an "olive-grove" trail that combines landscape and cultural-historical interest, as it was followed by Saint Francis to go from Assisi to Monteluco in 1218. Besides the olive groves and characteristic terracing, a variety of castles and villas dot the area. The first buildings erected outside Assisi were pigeon towers, which were used for an important production of pigeon (*palombino*) manure. These are still noticeable today because they rise above the roofs of rural buildings. Examples include a tower under the convent of San Martino, north of Trevi, a pigeon tower-house near the artificial lake of Pisciano, and the pigeon tower of the Natalucci family. Alongside the pigeon towers, other structures were built to process produce; notably, a number of mills. The millstones stood on the ground floor and were driven by animal power. A mill owned by the Chiacchierini family in Trevi, near the Collecchio springs, is still in use today. Other buildings commonly known as *chiuse*, used for the cultivation of the olive groves, were built along hill slopes. Among the still extant villas are Villa Vecchia, the so-called Le Loggie house, Villa Fabbri, the Monastery of S. Pietro, Villa Campello and Villa Spinelli. Today, the olive groves produce PDO (Protected Designation of Origin) "Umbria" extra-virgin oil with the geographic designation "Colli Assisi-Spoleto".

The stepped olive groves are in good condition today, both those with irregular layouts and the centuries-old trees growing on *lunette*, and continue to produce quality oil. Many of the old rural buildings in the area are still in good condition today, although originally there were a lot more.

Fig. 16.8 The olive orchards between Spoleto and Assisi show a great variety of tree-spacing patterns and tree husbandry methods

The olive groves' vulnerability is due to the threat of radical transformation as a result of conversion to industrial agriculture—which has already occurred in places—and to the abandonment of marginal areas. Because of their low profitability, older olive groves are being abandoned in favor of regularly laid out ones, which are easier to mechanize, but this diminishes landscape value and aggravates hydrogeological problems. Many villas and houses within the *chiuse* have been abandoned since the end of World War II. Only in recent years has one witnessed a slow recovery of these buildings for residential and tourist purposes; their renovation, however, should conform to historical building designs (Fig. 16.8).

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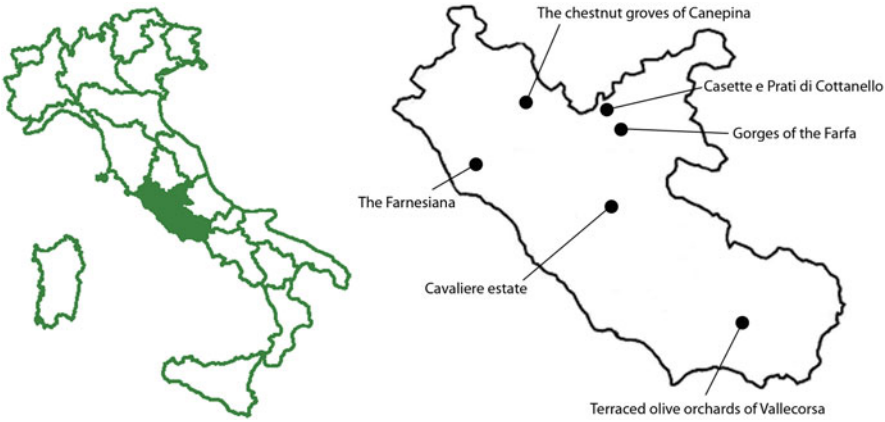
Chapter 17
Lazio

Piero Bevilacqua



17.1 Introduction

Among the regions of Central Italy, Lazio is no doubt the less homogenous territory and the one most lacking elements clearly defining its identity. From a geographical-administrative perspective, the historian Alberto Caracciolo called it a "'residual" area in between great historical regions'. On the one hand, to the north, it seems artificially separated from the Maremma area of southern Tuscany; to the east, the area around Rieti resembles the mountainous area of neighboring Abruzzi, while to the south, the provinces of Frosinone and Latina have much in common with the northern territories of Campania, and indeed once belonged in part to the Kingdom of Naples. Not to mention the dramatic unbalance created by the presence and

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power of the metropolis of Rome, which undermines any possible harmony, whether demographic, territorial or scenic.

At least two major factors have altered the landscape of Lazio. The first was the agrarian reform which, since the 1950, was applied to the northern area known as Maremma laziale, in the province of Viterbo, penetrating as far as the territory of the province of Rome. The second factor was the series of reclamations, begun in the 1930s, of the marshlands in the southern part of the region, in the provinces of Latina and Frosinone, but also in the southern coast area of the province of Rome, as well as the modernizing interventions of the Cassa per il Mezzogiorno.

Nowadays, the traditional landscape has been profoundly modified, though the new industrialized agriculture seems to duplicate to some extent the ancient organization. It is singular, for example, that presently one third of utilized agrarian surface is taken up by meadows and pastures, which means, if we add also the rotating forage meadows 'that about half the total agrarian surface of the region is used for feeding livestock'. In fact, Lazio was for a long time a land of pastures and wheat fields. Presently, agriculture takes up 42 % of the region and woods 35.2 %. Cultivations amount to 68.6 % of utilized agricultural surface and pastures to 31.4 %. But 'modernized persistences' take also other forms. Olive orchards, for example, which are scenically most concentrated in the Sabina area, connote the environment of many municipalities in the form of specialized monocultivations. The tree landscape has either continued in its traditional forms or adopted new ones following the development of mechanized agriculture. It is the case, for example, of the traditional vineyards of the Castelli Romani area, or that of the 'tendone' vineyards of the southern areas of the region. The modernization of the tree landscape has taken the form of specialized kiwi and peach orchards in the province of Latina, and of hazel groves in the province of Viterbo. Among traditional tree landscapes we have chosen three particularly significant areas: the chestnut groves of Canepina, in the province of Viterbo, the olive orchards of the Gole di Farfa, in the province of Rieti, and those of Vallecorsa, in the province of Frosinone. In the case of Canepina, we are dealing with an ancient rural landscape, typical of the Cimini Mountains. In this area, for centuries chestnut groves had dominated the higher lands, deeply influencing the economy and culture of local communities. Canepina is, so to speak, the emblem of this tradition, with its volcanic hills covered by 500 ha of chestnuts cultivated as high forest. The other two selected areas are significant instances of the ancient olive-tree landscape of the Lazio region. The Gole di Farfa, in the Sabina, are located on steep grassy terrain, which the patient work of farmers continues to preserve from erosion using dry-stone walls and artificial ridges. The area of Vallecorsa is a peculiar rocky landscape where olive-trees grow among calcareous outcrops conveniently modeled by farmers through the centuries. In the area of the Maremma in northern Lazio we chose the holding of the Tenuta della Farnesiana, located in the municipality of Allumiere, between Civitavecchia and Lake Bracciano. In this holding, one sees the salient features of the areas of the Maremma area and of the Tolfa hills, characterized by a balance between woods, Mediterranean scrub and extensive fields and meadows for forage, typical of the large extensive holdings of old. In the area of the Agro Romano, we chose the holding Tenuta del Cavaliere, east of Rome, characterized by pastures and fields with cereals

and forage. Finally, a significant example of the Apennine rural landscape is provided by the Prati di Cottanello. In this area, extensive pastures support herds of sheep and goats around which the economy of a number of small communities still revolves.

17.2 Casette e Prati di Cottanello (42° 25′ 00″ N; 12° 41′ 00″ E)

The area called the Prati of Cottanello, divided into Prati di Sotto and Prati di Sopra, occupies about 1,000 ha within a wider area of 3,600 ha, of which 2,400 are woods and mountain pastures and 1,200 are crops. It is located within the municipality of Cottanello, in the province of Rieti, at altitudes varying between 800 and 900 m a.s.l. The area is partly private and partly public and is protected under act 431/85. It can be reached from Rieti by taking state road SS 675/SS 79 to Contigliano and then via Fontecerro Nord for 13 km to Cottanello; Shortly before arriving in town you turn right in Via dei Prati and arrive at the locality I Prati e le Casette di Cottanello, while the part called Prati di Sopra can only be reached on foot. The area consists of meadows of karstic origin, on a substratum of whitish limestone with very fine grain, with veins of spathic calcite and flintstone, or of varyingly stratified white ceroid and subcrystalline limestone. The area of Cottanello owes its present morphology to the presence of quarries of pink marble, used in many Roman churches during the Renaissance.

It is particularly significant on account of the historical persistence of a landscape characterized by the alternation of pastures and woods, an encounter between human presence and natural environment, and is endowed with elements of great historical, productive and environmental value. The first reliable attestation of the existence of the *castrum* of Cottanello dates to 1027 A.D. Still visible are the remains of the ancient defensive system, based on two walls, and an interesting tower-gate in Via dello Steccato. Mention should be made also of the Eremo di San Cataldo, a picturesque hermitage built into the mountain and dedicated to saint Catald of Taranto. In the area there are also the remains of a Roman villa, probably built between the first century B.C. an the latter half of the second century A.D., evidence of the ancient land management system and of an intense agricultural activity. Pastures are used for many varieties of animals: horses, cows, sheep and goats and often free ranging pigs. Cultivations, consisting mainly of olives and wine-grapes, are found in the proximity of the town of Cottanello. As for woods, the holm oak is the main tree of the area, but chestnuts, oaks, downy oaks, beeches and Turkey oaks are also present. Among Turkey oaks, mention should be made of the Cerro Monumentale of Cottanello, a gigantic specimen 31 m high and with a circumference of 4.60 m, and of two monumental beeches the Faggio scritto and the Faggio con l'acqua, located in the area called the Fondo dei Faggi From Prati di Sotto one reaches the locality of Casette (little houses), so-called on account of the presence of small stone rural buildings, previously the residence of the farmers of the Orsini family, the owners of the castle, later abandoned or used as stables or shepherds' huts. In the area of Casette, mentioned should be made of an articulated system of water canals in stone

Fig. 17.1 Pastures and woods are the main elements of the landscape of Casette and Prati di Cottanello

with drinking troughs. A very popular bicycle route also goes through the area and on Sundays people come on excursions, while the area of Prati di Sopra and the woods are less frequented.

The integrity of the area is a result of its use for extensive pasture and of the continuing interaction of humans and nature, which has created a significant scenery from an historical and environmental perspective. Rural settlings have been only partially affected by the modernization of industrial animal breeding of the second half of the twentieth century, in regards to machinery, structures and the organization of animal-breeding and the work of breeders has remained a synthesis of modern and ancient. The growing of olive trees and vineyards in the valley and on the mountain slopes are integrated with human settlements. Some experimentation with organic agriculture are being carried out, and for certain types of cultivations modern systems have been adopted alongside traditional ones. An important factor is the maintenance of the canals used for water and to protect the land. The canals are presently in good shape and are organically integrated in the overall structure of the area. Casette and the surround areas are characterized by an undoubtedly attractive scenery, also thanks to the activity of the Township and to a number of small local tourist activities, which are careful to defend the landscape, notwithstanding their interest in increasing tourism.

The vulnerability of the area is tied to the advance of the woods on abandoned pastures and to the fact that some of the stone buildings are nowadays in bad condition and liable to collapse. This is partly the result of the depopulation of the area, which occurred in the second half of the twentieth century. Erosion and landslides, however, are still infrequent. Further intensification of modern cultivations could further modify the historical features of the landscape (Fig. 17.1).

17.3 The Chestnut Groves of Canepina (42° 23′ 19″ N; 12° 12′ 24″ E)

The chestnuts of Canepina are part of the chestnut groves of the Cimini mountains. They extend for about 1,000 ha in the small municipality of Canepina, in the province of Viterbo, at altitudes varying between 450 and 95 m a.s.l. The orchards are mostly privately owned. The area is located in part to the SCI (Site of Community Importance) and SPA (Special Protected Area) "Monte Cimino", and is protected under act 431/85. It can be reached by taking the provincial road Canepinese SP 25, which starts from the center of Canepina and cuts through the orchards till the intersection for Viterbo, or by taking the via Cassia Cimina (SP 1), which borders the chestnut orchards on the south-western side. As in all the Cimini mountains, the soil in this area is of volcanic origin. It consists of rhyolites and rhyodacites, and is tendentially acid, light and rich in organic substances. The nature of the subsurface favors the drainage of water and the soil is dry and friable. These characteristics, combined with heavy rainfall and a climate mitigated by the presence of the Lake of Vico, make the area of the Cimini mountains particularly suited to chestnuts trees and to their fruits.

The significance of the area is due to the historical persistence of chestnut grove, a type of woods that for centuries was the economic and nutritional basis of the populations of the Apennines. In the past, chestnuts had played a fundamental role in the farming economy of these mountain areas. For centuries they were exsiccated, boiled or made into flour for bread, replacing up to the post-World War II period the role of other cereals in the diet of farm-owners and sharecroppers. Chestnut trees were grown both as high forest for the production of chestnuts, and as coppice for the production of wood. The wood of the chestnut trees supported a long tradition of barrel making by local artisans, active in Canepina up to a few decades ago. This activity is attested by numerous documents since the Middle-Ages. It acquired a significant and long-lasting economic role, stimulated by the demand of wine producers of nearby Viterbo. Sheep were commonly allowed to graze in the orchards used for producing chestnuts, an activity which profoundly characterized both the internal structure of chestnut orchards and the scenery, a result of two different but complementary activities taking place in the same area. Grazing served to keep the undergrowth to a minimum, making it easier to pick up the chestnuts. The cultivation of chestnuts became less profitable in the 1950s and 1960s, when the fruit market crashed due to changes in taste and eating habits. The crisis was compounded by the increasing cost of chestnut gathering and the decline in the demand of wood for

Fig. 17.2 The chestnut groves of Canepina

barrels, replaced by containers made with other materials. As a consequence many centennial plants were cut down for firewood for the ceramic furnaces of nearby Civita Castellana. In the last few years, chestnut cultivation is again on the rise, thanks also to the institution of the PDO label "Castagna dei Monti Cimini" extended to the entire territory of Canepina. The annual production currently amounts to 2,000 tons of chestnuts and 500 tons of the "marrone" variety.

The integrity of the area is due to the rise of chestnut cultivation of the last 20 years after the crisis of the mid-twentieth century. Presently, the chestnuts orchards extend for over 500 ha, and constitute one of the largest chestnut areas of the Lazio region. The area reserved for coppices, whose wood is used by local carpenter shops, is slightly inferior. The chestnut orchards of Canepina are in good condition, having survived the attack of parasites and the changes in the rural economy of the area. About 60–70 % of the holdings are of small size (1.5–5 ha) and the remaining 30–40 % is between 5 and 20 ha. Mentioned should also be made of the marked tendency tendency towards organic agriculture by local producers.

Notwithstanding the good general condition of the chestnuts of Canepina and the marked effort that has been made by the Township to counter the decline in this cultivation and promote its importance, elements of vulnerability remain present. Unfortunately, chestnut trees of notable size have become increasingly rare and tend to fall victim to various diseases. Among these, besides the various typical diseases of chestnut trees, the greatest threat is represented by the spread of an insect recently introduced from China, the *Dryocosmus kuriphilus*, which seriously compromises the production of chestnuts by trees. While not a threat to the health of the trees itself, the decrease in productivity caused by this parasite could lead to

Land uses 2008	Surface (ha)	Surface (%)
Urban area and courtyard	39.17	2.30
Shrubland	17.15	1.01
Conifer forest	19.84	1.16
Chestnut coppice	672.47	39.40
Mixed forest	20.43	1.20
Chestnut orchard	788.76	46.21
Fruit orchard	2.49	0.15
Fallow	6.41	0.38
Hazelnut orchard	86.51	5.07
Hazelnut orchard with chestnut tree	4.51	0.26
Olive grove	9.08	0.53
Olive grove with hazelnut and chestnut tree	1.64	0.10
Vegetable garden	2.59	0.15
Pasture	19.67	1.15
Wooded pasture	1.29	0.08
Meadow	5.07	0.30
Meadows with chestnut tree	3.19	0.19
Meadows with olive tree	0.80	0.05
Arable land	5.06	0.30
Vineyard	0.48	0.03
Vineyard with olive tree	0.31	0.02
Total	*1706.92*	*100.00*

Evaluating indices of landscape	
Number of land uses	21
Number of patches	694
Total surface area (ha)	1706.92
Average surface area of patches (ha)	2.46
Average surface area of arable land patches (ha)	0.57
Average surface area of chestnut orchard (ha)	2.58
Hill's diversity number	3.72
Class of landscape integrity (I–VI)	VI

another crisis in local chestnut farming. Sheep no longer graze under the chestnuts which are instead periodically mowed. Chestnut gathering has been almost entirely mechanized, while manual gathering is only done on the steeper terrains. Mechanization has significantly reduced the time and cost of gathering, but the absence of livestock has determined the loss of that interaction between chestnut growing and sheep farming that for centuries had shaped a good part of the Apennine landscape (Figs. 17.2, 17.3).

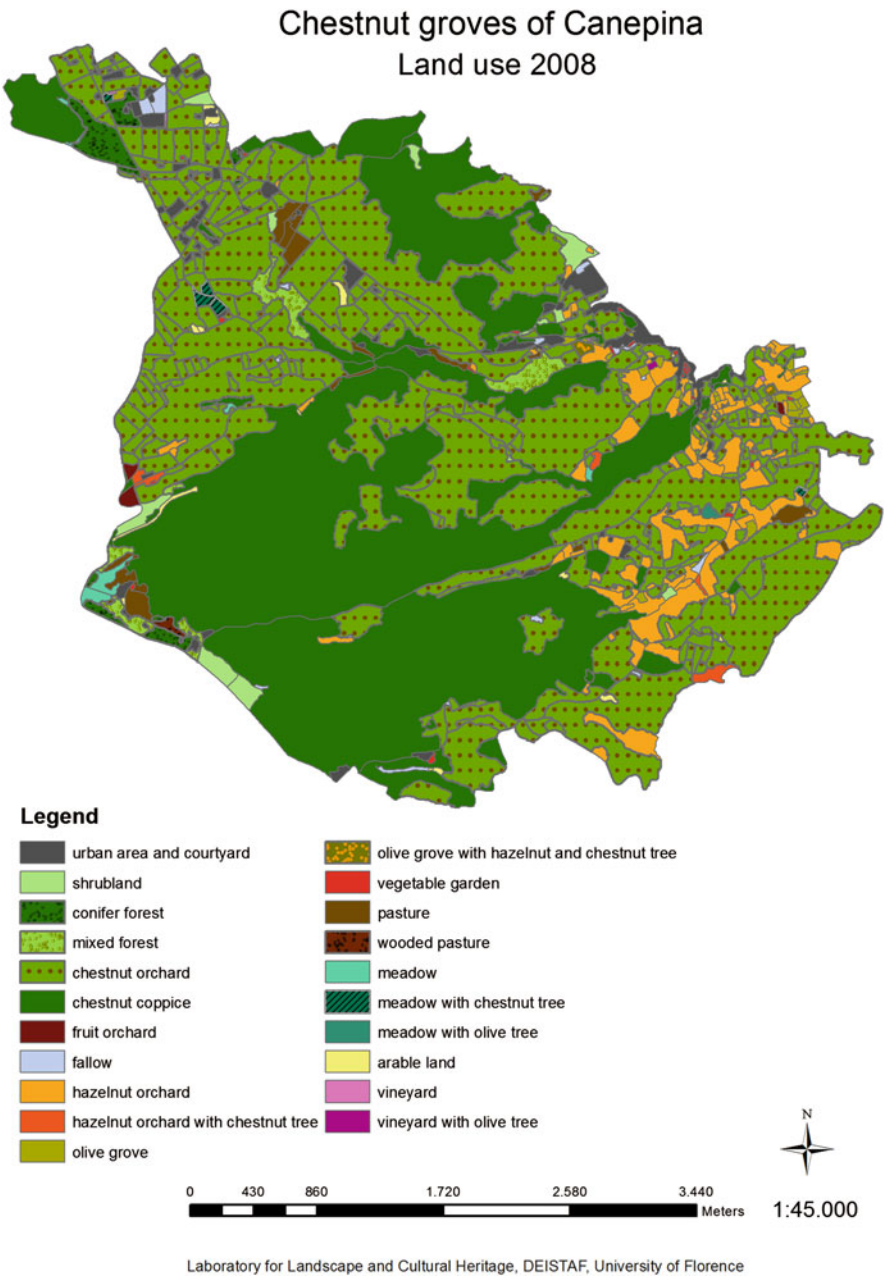

Fig. 17.3 Chestnut orchards historically dominate the area around the village of Canepina, while chestnut coppice can be found in the steeper mountain slopes. An interesting feature of the area are the hazelnut orchards, pure or mixed with olive trees, chestnut trees or vineyards, representing the third land use in terms of extension. Both the forest and the agricultural mosaic is made up of many small patches, with a reduced average size. Overall, the historical landscape shows a high degree of integrity; it owes its vulnerability in various diseases affecting the chestnut trees and in the interruption of traditional grazing in the chestnut orchards, used to clear undergrowth and to bring fertility to the soil

17.4 The Farnesiana (42° 11′ 21″ N; 11° 52′ 42″ E)

The holding called Tenuta della Farnesiana presently occupies a surface of about 400 ha on the north-western slopes of the Monti della Tolfa mountainous region, at an altitude varying between 150 and 360 m a.s.l. The area is private property and is located in the municipality of Allumiere, in the province of Rome. It belongs to the SCI (Site of Community Interest) "Boschi Mesofili di Allumiere" and to the SPA (Special Protected Area) "Comprensorio Tolfetano-Cerite-Manziate", and it is protected by the landscape law n. 431/85. The Tenuta della Farnesiana can be reached by taking state road Aurelia and then, at 84.2 km, the local road Melladra-Farnesiana until the locality of Farnesiana. Alternatively, from Allumiere you can take the provincial road via Farnesiana, which from the town goes north, down into the valley, towards the abandoned railway station and follow it for 7 km. The terrain declines towards Tarquinia and the medieval site of Cencelle while to the south the area penetrates the woods of Monte Palano for about 3 km. The entire area of the Monti della Tolfa is the result of one of the most ancient volcanic activities of the Lazio region. The terrain appears eroded, lowered and irregular. From the gently curving hills, made of sedimentary rock formation, rough looking and steep trachytic peaks protrude here and there. One of the most notable of these is Ripa Maiale, on the western border of the Farnesiana.

The significance of the area is due to the historical persistence of the landscape, dating back to the medieval period, which synthesizes in a few 100 ha the salient traits of the areas of the Maremma Laziale and of the Monti della Tolfa, where open range animal farming is still practiced. The landscape of the Farnesiana is characterized by a balance and integration between the role of pasture, crops and woods in the economy of the holding. The cattle of the *maremmana* variety have become perfectly adapted to this mixed environment. This species is particularly strong: it tolerates climatic difficulties and adapts well to marginal terrains and low-quality forage. The work of these animals was for centuries essential to all local economic activities, from agriculture to mining. This rural landscape has its roots in the Etruscan civilization, whose presence is attested by a number of tombs, though the first documents that attest the agro-pastoral exploitation of the area date only to the High Middle Ages. Historians date the development of the economy of the Farnesiana, the origin of the name, and the growth of a small settlement, to the late sixteenth century, when began both the extraction of alunite and other minerals from the surrounding quarries, and the expansion of agriculture, stimulated by the flourishing market of nearby Corneto, in the municipality of Tarquinia. It is in this period that the Olgiati family, who had the contract for the mines, decided to intensify the cultivation of cereals and the farming of cows and sheep, establishing a major farm in the Farnesiana area. The management of the farm was entrusted to clerics belonging to the Chiesa del Gesù, locally known as *farnesiani*. A bakery, a chapel and a small settlement for miners and farmhands were built. Towards the mid-nineteenth century a majestic Neo-Gothic church was added, which is still visible. The area of the Farnesiana remained property of nobility up to the post-World War II period. It originally extended for 11,000 ha but

Fig. 17.4 Free-roaming cattle of the Maremmana variety in a dry pasture on the Farnesiana farm

was substantially reduced by the agrarian reform programs of the Ente Maremma, which resulted in a fragmentation of holdings of which the signs are still visible. Today, the Tenuta della Farnesiana hosts a farm which besides functioning as a tourist farmhouse continues to produce traditional food products, including beef and pork meat, vegetables, wine, olive oil, and fruit. About half of the surface of the farm is covered by Mediterranean scrub and by mixed oak woods, with a prevalence of Turkish oaks and holm oaks; on the south-western slope there are also about 20 ha of cork oaks. Both the mixed oak woods and the cork oak woods are regularly maintained. They play an essential road in the free range breeding of *maremmana* cattle, amounting to about 250 animals, which find there shelter from the heat during the summer. An ample portion of the area is used as dry meadow, with annual mowing for the pasture of the cattle, while about 70 ha are used for the rotation of crops without irrigation, among which durum wheat, oats and barley.

The integrity of the area is ensured by the balance between cultivated areas, pasture and woods, which are regularly used. The agriculture practiced at the Farnesiana shows a high degree of integration between cattle breeding, cultivations and forestry,

in contrast with the modern trend towards a clear-cut separation between woods and agriculture. The place where the farm is now located corresponds approximately to the one called Campo della Mola in the Middle-Ages, which was the site of the old farm. The presence of the old agricultural center, with its small settlement, of the imposing Neo-Gothic church, the granary, and other buildings used for the farm, increase the appeal and uniqueness of the area.

Inside the holding there are no notable vulnerabilities: agricultural activities seem stable and the land is well-maintained. Occasionally, new materials have been used to replace the old wooden fences. In general, however, in the area of the Monti della Tolfa, hay and crop fields are being replaced by bushes and other spontaneous vegetation that occupy abandoned field and pastures (Fig. 17.4).

17.5 Gorges of the Farfa (42° 15′ 00″ N; 12° 45′ 00″ E)

The area of the gorges of the Farfa river is characterized by the presence of olive orchards, common to all the municipalities of the Sabina area. It extends for about 600 ha in the municipalities of Mompeo, Castelnuovo di Farfa, Salisano, Casaprota and Montenero Sabino, in the province of Rieti, at altitudes between 140 m a.s.l. at Fosso di Salisano and 460 m a.s.l. in the town of Mompeo. The area is partly private and partly public. It was nominated Monumento Naturale (Natural Monument) Gole del Farfa, and belongs to the SCI (Site of Community Interest) and SPA (Special Protected Area) "Farfa Corso Medio-Alto", besides being protected under law 431/85. It can be reached by exiting state road Salaria (SS 4) near Osteria Nuova, provincial road Mirtense near Castelnuovo di Farfa or provincial road Tancia near Mompeo. The gorges cut through hills made of limestone and boundstones, calcarenites, sandstones and conglomerate, and, subordinately, by finely grained whitish limestone with veins of spathic calcite and cherts. The terrain is particularly varied and occasionally steep, but with generally gentle contours.

The significance of the landscape of the Gole del Farfa is tied to the millenarian persistence of traditional olive orchards combined with grassland, cultivated even on steep terrain thanks to the use of the 'lunette' (small semi-circular containing walls), which support small terraces, thus characteristically modeling the slopes and creating, along with the archeological remains, the wooded gorges and the river, a rural mosaic of great scenic, cultural and natural importance. The cultivation of the olive-tree, practiced in the Sabina area already in the Roman period, has been a unifying feature of the rural landscape. A number of extremely old olive-trees were probably planted in the Roman period. In Canneto, a sub-municipality of the commune of Fara in Sabina, there is one of the greatest olive-trees in Europe, with an estimated age of 2,000 years. With the fragmentation of the Roman latifundia during the Middle-Ages, these territories came under the rule of the Abbey of Farfa, whose rich historical documentation offers information on land usage and the economic relations with the city of Rome, with which the Abbey traded olive oil and other agricultural products. More recently, the large estates where further subdivided into

Fig. 17.5 The agricultural mosaic of the Farfa gorges

a series of small holdings, with an extension ranging from 2 to 10 ha. The production of olive-oil was for a long time the center of the local economy. In the twentieth-century, it was increasingly combined with sheep farming and the production of meat, cheese and wool. Local olive-oil is based on the typical olives of the Sabina area: Olivastrone, Carboncella, Olivago Sabino, Oliva tonda, Fusella, Oliva nebbia, Rosciola and Raja, with which a quality olive-oil is produced with the PDO label 'Sabina'. There is also a Museum of the Olive-Oil of the Sabina at Castelnuovo di Farfa, located in the sixteenth-century Palazzo Perelli and in some traditional buildings in the historical center, such as an ancient bakery and an olive-oil mill with a mill-stone propelled by animals. An important event in the area is also the fair 'Andar per Olio e per Cultura' (On the Road for Oil and Culture), which in the month of December attracts tourists, agronomists and olive-oil fans. Local traditional architecture is also typically associated with olive-oil production, with scattered rural houses dating from the lower Middle-Ages to the modern age, and with the remains of water-mills and aqueducts along the river Farfa at the beginning of the gorges. In recent years, a few cooperatives of young people have rented marginal or abandoned olive orchards, combining farming with excursions for tourists and didactic activities in the more picturesque areas of the Gole and in the archeological sites associated with olive-oil culture, such as the water-mills Naro-Patrizi along the river and the Roman rural villa, in the Monte locality, on the western slope of the hill of Mompeo.

The integrity of the landscape is basically due to the preservation of the olive orchards, notwithstanding the increasingly old average age of the farmers and the high costs of workforce, due to the steepness of the terrain and the ensuing difficulty to use modern machinery. In the Roman villa in the locality called Monte an extensive system of underground arcades is still visible, originally used for the production and storage of olive-oil. Also visible are tanks for the sedimentation of olive-oil and the olive-oil cell. A sizable medieval mill is also present, divided into three rooms, in which the mill-stones for the olives are still visible. Many of the works used for carrying and discharging water are still intact. Still visible are the remains of an aqueduct bridge of the late Roman period and a long perfectly preserved gallery. Many olive-orchards are now cultivated using organic methods.

The vulnerability of the area is associated with the abandoning of agriculture, presently limited to marginal olive orchards and those located on steeper terrains, which are difficult to mechanize. But what has declined the most and is on the verge of disappearing for good, is the traditional pasturing of sheep in olive orchards. As a consequence, various weeds have spread, such as the *Ampelosdesmos mauritanicus*, a plant that suffocates local species and that up to a few years ago was mowed by shepherds for forage. Other elements of vulnerability result from the creation of specialized high-density olive orchards, which alter the historical and unique aspect of the traditional landscape (Fig. 17.5).

17.6 Terraced Olive Orchards of Vallecorsa (41° 26′ 43″ N; 13° 24′ 45″ E)

The area consists of a series of terraced olive orchards extending for about 600 ha, obtained by excavating calcareous rock. It is located in the municipality of Vallecorsa, in the province of Frosinone, and is part of the SPA (Special Protected Area) of the Ausoni and Aurunci mountains. The area can be easily accessed through the A1 toll road. From the north, it can be reached by exiting at Frosinone and proceeding on state road SS 637 in the direction of Ceccano-Vallecorsa. From the south, it is best to exit A1 at Ceprano, and continue on the provincial road SP "Caragno" in the direction of Castro dei Volsci. Having reached Castro dei Volsci, one continues towards Vallecorsa on state road SS 637. The altitude varies between 240 m a.s.l. in the valley and 800 m a.s.l., while the town itself is located at 350 m a.s.l. Vallecorsa is located on a calcareous outcrop on the south-western slopes of the Ausoni massif. This massif is made up mostly of calcareous rock and has been profoundly shaped by karstic phenomena of often considerable magnitude. Dolines, swallow-holes, caverns and basins, dot the mountain ridges, including the one that marks the eastern border of the valley of Vallecorsa. A great quantity of calcareous rocks and carious rocks of bizarre shapes surface from the soil which is not covered by volcanic materials. The land of the municipality of Vallecorsa is mostly mountainous.

Fig. 17.6 In the rocky scenery of Vallecorsa the natural karstic modelling of limestone outcroppings has been exploited and refined by farmers to make room for olive orchards

The significance of the area lies in its traditional historical features and in the beauty of its "rocky scenery", where the natural karstic modeling of limestone outcroppings has been exploited and refined by farmers to make room for olive orchards. These aspects are part of a general rural landscape of great beauty characterized by the historical persistence of cultivations. The terraced olive orchards are usually located between 300 and 700 m a.s.l., though in some cases go as far up as 800 m a.s.l., close to the upper limit of the olive-tree's habitat. Using sledge-hammers, farmers broke up the boulders and used them to create countless dry-stone walls to protect their sheep and their fields, to build wells, reservoirs, and houses, but especially to support the terraces on which olive orchards were planted. According to the oral tradition, men were responsible for breaking up the hard white limestone boulders, while women brought the soil from the valley up to the terraces in baskets carried on their heads. The cultivation of olives dates probably back to the Roman period, though it is not possible to state when farmers began modeling the limestone boulders. We do have, however, thirteenth century statutes of the small community, reconfirmed by the Colonna family towards the mid-sixteenth century, that bear witness to the importance of protecting the olive-trees and especially the olives. The code established the exorbitant fine of 3 ducats for those caught gathering "the olives of someone else whether on the ground or from the plant in whatever season (...) without the owner's permission." Besides the olives, the statutes protected also the rocks, which in Vallecorsa are inseparable from olive trees. The historical presence

of olive orchards in Vallecorsa is attested throughout the centuries by various marriage contracts and eighteenth-century inventories of the three parish churches of the town as well as by data on oil production which, towards the mid-nineteenth century, was around 21,000 libbre almost entirely reserved for export. The specialization and intensity of cultivations is confirmed by the agrarian land register of 1929, which listed 818 ha of olive orchards, with an average of 236 plants per hectare. Here, dry-stone walls bear the local name of *macere*. They have a solid imposing aspect due to their thickness (about 1 m), to their height, which varies between 2 and 3.5 m, and to the great size of the limestone blocks, placed one over the other without using any binding material. To avoid pressure that could result into landslides, almost all plants are further enclosed, so that one can find terraces built to host a single tree.

The scenery retains a high degree of integrity and is of great interest, not solely on account of the traditional olive orchards, but also of other cultivations and pastures located on the mountain slopes, which enrich and vary the scenery. The sunny and rocky slopes of the mountains of Vallecorsa are still dotted by two million cubic meters of terraces. While there no longer are teams of workers to maintain the walls, and olives belong to small properties cultivated owners as a hobby more than for profit, olive orchards still extend for about 600 ha, i.e., almost the same surface of 1907. In many cases, olives are still gathered by beating them with a long stick, though modern machines are increasingly being used.

One vulnerability is a consequence of the disappearance of sheep farming. Traditionally, sheep slept under the olive trees and provided manure, while nowadays chemical fertilizers have been adopted as well as herbicides to clear weeds. The greatest risk is that this form of cultivation be definitely lost due to the abandoning of agriculture by the local population. Besides the loss of an incredible landscape, this would also lead to significant hydro-geological problems. For example, in the areas which cannot be accessed by motor but only through paths or mule-tracks, there are already signs of landslides and other problems (Fig. 17.6).

17.7 Cavaliere Estate (41° 56′ 00″ N; 12° 40′ 00″ E)

The landscape characterizing the area of the Cavaliere estate (Tenuta del Cavaliere) is typical of extensive agriculture. The area is public property and extends for about 438 ha, at an altitude of 50 m a.s.l., in the municipalities of Rome (V Municipio) and of Guidonia Montecelio. The area borders to the north with the Via Tiburtina and the properties Tudini and Del Fante, to the east with the holding of the Tenuta Martellona, and to the south with the Aniene river; to the west it borders with the neighborhood of Rome called Case Rosse. The area is protected under act 1497/39. It can be accessed by turning on to Via della Tenuta del Cavaliere at 16.8 km of Via Tiburtina-Valeria at 16.8 km in the direction of Tivoli. It can also be reached by taking via Collatina in the direction of Lunghezza, up to the junction with Via della Tenuta del Cavaliere. Coming from toll-road A24 instead, you need to exit at Settecamini and then follow directions for Via della Tenuta del Cavaliere. The Tenuta extends over a flat terrain of volcanic origin, on the right bank of the Aniene river, on a substratum made partly

of lithic tuff and partly of inferior pozzolana rock. The substratum of the area closest to the Aniene river is made instead of clays, silts, sands and recent fine alluvial gravel. On a tuffaceous ridge, originally the raised center of a crater, lies a large farmhouse.

The significance of the area is due to the historical persistence of a landscape typical, in the modern age, of the extensive agriculture of the 'Agro Romano,' i.e. the countryside around Rome, owned by noble families or religious bodies and characterized by wheat and forage cultivation and animal farming. The area is therefore of extreme historical and cultural significance for the Lazio region, the more so in the light of its closeness to the city of Rome and of it being one of the agricultural areas of 'urban centers,' as defined in the National Strategic Plan for Rural Development 2007–2013. The plan refers to agricultural areas located inside or near urban settlements, which play a fundamental role in the defense of the landscape and the environment. The name Tenuta del Cavaliere dates to the seventeenth century, when the three holdings of Casale Nuovo, La Cementara and Palazzetto were unified by the family De Militibus-Cavalieri. The ancient farmhouse has been built around a defense tower, and is the interesting result of various architectural stratifications and phases in the administration of the holding. In 1635, the Tenuta became part of the lands of the Hospitaler order S. Giovanni di Dio, which also owned the Fatebenefratelli hospital in Rome. In the holding, wheat and forage were cultivated, small and larger animals were farmed, and the pastures where rented out, according to a scheme typical of the Roman countryside. Most of the products were used for Roman hospitals. At the end of the eighteenth century, the holding was united with the adjacent Tenuta di Castell'Arcione and a number of species of trees such as elms, British-oaks, ash-trees, and poplars were planted. In 1896, the ownership was transferred to the Pio Istituto di S. Spirito e degli Ospedali Riuniti di Roma After 1870 Rome became the capital of the new Reign of Italy the government became strongly committed towards improving the Roman countryside. In this context, important reclamation work was carried out in the Tenuta along with other improvements up to the 1910s. In the post-World War II period, the agriculture of the Tenuta centered on forage and cereals and on the breeding of cattle for milk and meat. In 1980, after the abolition of the Hospitaler orders, the Tenuta del Cavaliere, along with the neighboring Tenuta di Castel di Guido, became property of the Rome township. It continued, however, to be an agricultural area except for 140 ha, which were assigned to the new Centro Agroalimentare of Rome. Since the 1970s, near the borders of the Tenuta, the Roman neighborhoods of Lunghezza, Lunghezzina, Castelverde, Case Rosse and Setteville have developed. The gradual urbanization of these areas has steadily increased the importance of the Tenuta as a natural and agricultural area. In the 1990s, a reforestation program has been carried out in marginal areas of the Tenuta, for a total of 25 ha, with the planting of pines, holm-oaks, apple-trees, walnut-trees, and oaks. A program of organic agriculture has also been started.

The Tenuta del Cavaliere, unlike many other areas of the Roman countryside, has maintained to a large extent its integrity and the landscape has remained highly 'legible': this rural heritage seems even more crucial when compared to adjacent areas of the Rome periphery, which are devoid of any significant green areas. Notwithstanding the change of ownership of 1980 and the growth of new residential neighborhoods

Fig. 17.7 The historic Cavaliere estate is a representative landscape feature of the Agro Romano

nearby, the economy of the area, as shown by the holding's official plans, have remained oriented towards the cultivation of forage, now prevalent over cereal crops, and the farming of animals for milk. Milk is sold to the dairies of Castel Guido. The Tenuta is periodically opened to the public for recreational and cultural events. The quality of its food products, the beauty of the landscape, and its initiatives aimed at rediscovering the historical heritage of the Roman countryside, make it an outstanding example of multifunctional agriculture.

The vulnerability of the Tenuta is caused by the growth of surrounding urban areas, against which it has plays a fundamental role in safeguarding the landscape and the environment. Another vulnerability is tied to the periodic inundations of the Aniene River, which can be particularly destructive, as in the case of the 1937 one, compromising seasonal cultivations and damaging infrastructures. Furthermore, a complex administration by the town in collaboration with regional ASL (Local Health Agency) caused, towards the end of the 1980s, a decline in investments due to the reduced size of the Tenuta (Fig. 17.7).

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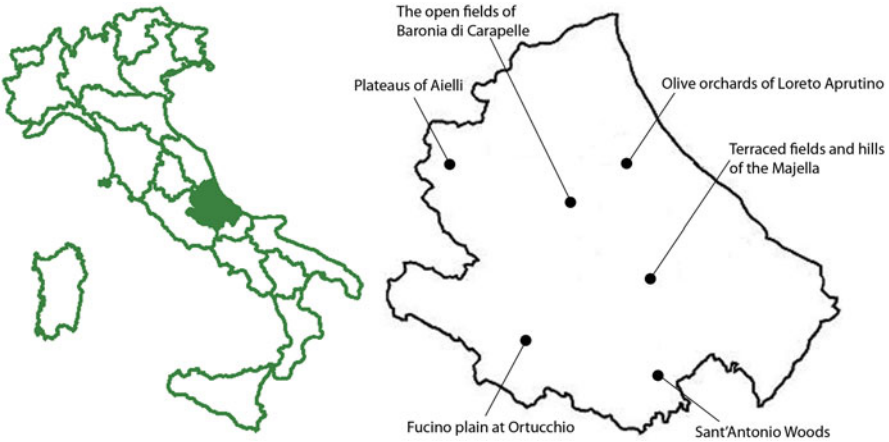
Chapter 18
Abruzzo

Piero Bevilacqua



18.1 Introduction

Abruzzo is the most mountainous region in peninsular Italy. 71 % of its surface consists of mountains rising almost as high as 3,000 m, 29 % of hills, and there are no plains. This has forced its inhabitants to develop special forms of adaptation of agricultural techniques to a difficult environment, and this accounts for the local landscape's distinctive features. Among the regions of the Italian South, Abruzzo is the one that has achieved the most satisfactory forms of economic modernization over the last half century, thanks to the spread of small and middle industry, the modernization

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of agriculture, and a more judicious land management than elsewhere in Italy. It is for this reason, as well as because of its prevalently mountainous character, that it is one of the southern regions that has best preserved its traditional landscapes, which are organized by altitude and include cultivated areas, woods and pastures, and historical testimonies dating as far back as the Roman period. Even today, in spite of the spread of small and middle manufacturing businesses, pastoralism and related agricultural activities are still the prevalent feature of the Abruzzan countryside. Seventy percent of the overall agricultural surface is given over to this agropastoral economy, with 38 % of permanent fields and pastures, 22 % of cereal fields, and 12 % of relay-cropped fodder fields. Forty percent of the region's surface is covered with woods. We have picked six areas as especially representative of the historical reality of this specific, traditional agricultural and landscape reality. The Sant'Antonio woods is one of the most significant example of woods called *difesa*, "defense"; areas reserved as wooded pastureland, all other forms of use being banned. In the Sant'Antonio woods are vestiges of a *lucus*, a sacred woods of Roman times. The employing of a form of pruning for fodder called *pollarding* resulted in peculiar shapes for the local beech trees. Today, unfortunately, this mixed pasture and woodland landscape is threatened by abandonment and the expansion of compact and homogeneous woods. Another representative area is that of the terraced fields of the higher hill slopes of the Macella. Terracing is a widely employed technique on the steep slopes of the traditional landscape of Abruzzo. The Macella terraces lie in the agropastoral area of Roccamorice, Lettomanoppello and Abbateggio. They mainly consist of artificial meadows grading down to the valley below, alternating with crops such as spelt, olive trees, grapevine, and fruit trees. The most remarkable features of this agrarian landscape are the terraces themselves, and the dry-stone masonry used for enclosures and for the typical "tholos" stone huts of Abruzzo shepherds. Natural meadows and fodder fields characterize the landscape of Piani di Aielli. Here one can still see the so-called "ribbon-shaped" layout of the open common fields where cereals are grown; an ancient form of cultivation coexisting with the grazing of livestock on mown-grass fields (campi da sfalcio). Like other Abruzzan mountains, including the Gran Sasso itself, the Aielli landscape bears witness to the "cooperative" dimension of the Abruzzan countryside, where over the centuries farmers and shepherds have struggled to extract sustenance from sterile soils in a harsh climate. The fields of the Baronia in the Majella mountain range, instead, are an unusual example of an integrated, silvopastoral conception of the function of two different areas. Here the fields are divided in two "shifts" (*veci*). A "full shift" of barley is alternated with an "empty shift" of potatoes. The crops are rotated from one plot to the other according to a regular schedule including a long grazing period on fields where renewal crops are to be sown. The fields are thus economically interdependent one from the other. A significant example of the landscapes of the region are the olive orchards of Loreto Aprutino in the province of Pescara. Located in an inland hilly area, they are one of the most representative features of the Abruzzan agricultural landscape. Here the growing of often very large centenary olive trees, and hence the preservation of agricultural and habitat biodiversity, manages to coexist with high yields. The Loreto Aprutino area produces an excellent olive oil on an industrial scale. The choice of Ortucchio, in

the Fucino Plain, reflects a precise documentary intention. We chose the agricultural landscape of this small commune as a testimony of a "reclaimed" landscape, a result of the draining of the Fucino lake around the turn of the nineteenth century. This, as the historian Costantino Felice defined it, is the "pulp" of the Abruzzan Apennines: a vast plain once occupied by the third largest lake in Italy, and now making plain agriculture possible in the midst of the mountains. Since the agrarian reform started in 1950, an archipelago of small and middle sized farming businesses have sprung up here. Irrigation—now undermined by increasing water scarcity– has shaped the landscape, which is dominated by rectangular vegetable gardens intersected by roads and canals often flanked by high poplar trees. The draining of the lake had already been attempted by Claudius in Roman times. This dramatic and in some ways controversial transformation has generated a very special agricultural landscape.

18.2 Sant'Antonio Woods (41° 56′ 11″ N; 14° 02′ 03″ E)

This is a wooded landscape extending over about 500 ha in the commune of Pescocostanzo (AQ), partly owned by the municipality and partly privately. Today it lies within the Majella National Park, but a regional natural reserve was already created in 1985, recently a Site of Community Importance (no. IT711039, "Pizzalto Bosco di S. Antonio") was also established. The landscape is protected also according to the landscape laws n. 431/1939 and n. 431/1985. It can be reached from Pescocostanzo by the SP 55 provincial road, 10 km; from Sulmona, by the SS 487 state road (via Cansano) and the SP 55 provincial road, 21 km; from the SS 17 state road, junction for Pescocostanzo, 13 km. The area is a karstic plateau (Piano Primo Campo) bordered and dotted with calcareous rises. It extends from NW to SE and is bounded by the crests of Mount Rotella (2,127 m a.s.l.) and Mount Pizzalto (1,969 m a.s.l.). Its altitude ranges between 1,290 and 1,420 m a.s.l.

The area owes its significance to its historical persistence and the peculiarity of its wood cover, characterized by pollarded beech trees, a traditional form of pruning to produce fodder. These are a typical, if little known, feature of many Abruzzan woods, whose importance as a landscape feature is underrecognized. One of the first landscape preservation battles in the history of the Italian Republic was fought in defense of the S. Antonio Woods and also Luigi Einaudi, former President of the Italian Republic (1948–1955) stressed the need to protect this forest. Elena Croce aptly characterized them as a "sanctuary of nature and pastoral civilization". Today they are a very well-preserved example, and possibly the most significant both in Abruzzo and in the whole former Kingdom of the two Sicilies, of "*difesa*" woods (defense woods). "A *difesa* is an area where other uses are forbidden, because it is reserved for the grazing of equines and bovines, but not sheep". *Difese* were wooded pastures serving as a *meriggio*, i.e., an area where livestock could graze in the shade in the hot hours of the day. The felling of trees was not allowed in *difese*; only pollarding for firewood and fodder. A typical feature of a *difesa* are pollard trees, the result of pruning about 2 m above the ground to produce shoots. In practice, this is an aerial form of coppicing suitable for the production of leaves for fodder high above

the ground, beyond the reach of grazing animals. The S. Antonio Woods housed a *lucus* or sacred grove of the Roman period or earlier, which stood along an important road connecting Sulmona, the Volturno valley and the upper Samnium. Traces of this road survive in the northern part of the woods (*Via Minucia* or *Numicia*). The woods derive their present name from a religious congregation of the Antoniani, engaged in hospital assistance. The congregation is devoted to S. Antonio Abate, protector of animals, and has a small church on the east edge of the woods. The presence of the nearby towns of Pescocostanzo, Rivisondoli and Roccaraso, in spite of the high altitude, and of farmhouses along the edges of the plateau, bears witness to the importance of the pastures and agricultural activities in this area. The S. Antonio Woods are especially remarkable for the size and composition of their trees, which include beech, Turkish oak, field maple and other species of maple, cherry, pear and holly trees growing to larger than average sizes. Over thousands of years the high altitude meadows were extended to provide grazing grounds for transhumant flocks, a trend that intensified in the twentieth century. Level areas, instead, were used as pastures for bovines and equines, as well as cereal growing, although not continuously. This land use has given rise to a spectacular landscape alternating woodland with open areas offering views of the highest summits of the Apennine. The landscape of the karstic plateau surrounded with wooded slopes is a still well-preserved fragment of the plateau complex of inland Abruzzo. Its articulation into several plateaus delimited by mountains contributes to the impression of integrity this landscape gives out, which it principally owes to the preservation of traditional forms of production. Indeed, the major plateaus of Abruzzo have been aptly characterized as "places of wise exploitation". The local farmhouses bear witness to the more intensive use of the level areas.

The integrity of the area appears essentially intact, although there have been variations in the proportion of land devoted, respectively, to woodland and pasture, and in the characteristics of individual trees. Following the resistance of the local population to attempts to exploit the woods that would have disrupted their natural balance, and thanks to appeals by several intellectuals (Gaetano Salvemini wrote a heated article on the weekly journal *Il Mondo*), on 27 January 1953 the S. Antonio Woods were placed under landscape restrictions under the provisions of law n. 1947/1939, recently followed by the natural reserve, the national park and the SCI. The diminished pressure of sheep grazing is partially compensated by the growing population of wild ungulates. The woods have grown over the last few decades, while the integrity of the area has been only partially altered by buildings used as summer residences concentrated within a limited area. As to the portion of wooded pastureland that makes up the S. Antonio Woods proper, its traditional pastoral use and legal protection have allowed it to retain its ancient character of "sacred and domestic grove".

For what concern vulnerability, the management of the woods is presently conditioned by the Park plan and regulations. The Park's zoning map presently includes the woodland areas in Zone A (Integral Reserve). This kind of protection, while certainly appropriate for natural areas does not appear suitable for the preservation of the S. Antonio Woods, while the law n. 431/1939 and n. 431/1985 are also ineffective

Fig. 18.1 A huge pollarded beech tree in the Sant'Antonio wood. The lack of specific management practices is leading to the disappearance of important elements of the Italian forest landscape

to protect the internal structure of a rural landscape. An accurate examination of the woods indicates that over time the characteristic gaps in the forest cover have been disappearing, and, above all, the trees have been losing their peculiar shapes determined by the practice of pollarding. The reforestation of clearings is favoring beech to the detriment of the other species that play such an important role in characterizing and diversifying these woods. Detailed planning is hence called for to preserve the area's identity; a problem, unfortunately, that regards many Italian wooded areas which are presently losing their original landscape values (Fig. 18.1).

18.3 The Open Fields of Baronia di Carapelle (42° 20′ 32″ N; 13° 39′ 31″ E)

The Piani della Baronia di Carapelle are open fields lying in the Viano and Buto ("full" and "empty") plateaus, which together form an elongated 8-shaped valley extending over about 220 ha. The area is fully included within the Gran Sasso and Monti della Laga National Park, the landscape is protected also by the landscape law n. 1497 of 1936. It lies within the municipalities of Santo Stefano di Sessanio, Calascio,

and Castelvecchio Calvisio, in the province of l'Aquila. These can be reached from l'Aquila by the SS 17 state road, taking the turn for Barisciano once near Campo Imperatore. The fields lie in tectonic depressions alternating with rounded parallel rises composed of marly limestone, calcarenite and breccia descending from the southern slope of the Gran Sasso towards the Aterno Valley. A single road runs along the longitudinal axis of the valley. The fields are lined up on either side of it, arranged so as to always face the road with one of their short sides, whose length is about 1/10 of the long sides. The area is modeled by superficial karstification. This phenomenon results in a lack of a superficial water network and an abundance of wellheads. It is also responsible for the morphology of the tectonic depressions, which form large hollows, known as *polije*, extending for several kilometers and lacking a developed hydrography because the water tends to seep deep down into the ground.

The area owes its significance to its historical persistence and the beauty of its pasture and open field landscape. As early as Roman times it was crossed by the Via Claudia Nova. By the late 1200s or early 1300s, the Barony of Carapelle was a vast and important feudal dominion where agriculture and pastoralism flourished. After it had changed hands several times, in 1579 the last heir of the Piccolomini was forced to sell the feud to the Grand Duke of Tuscany, Francesco de' Medici. In this period the Barony of Carapelle and the Marquisate of Capestrano reached the peak of their splendor. The Medici family established here their principal base of operations for the commerce of the prized *carfagna* wool, produced in the Barony's estates, worked in Tuscany, and sold in Europe. The pastoral economy is thus the dominating feature of this area, although not the only one, while agriculture was mainly practiced at the family level for subsistence purposes. The local open fields go back to an agronomic system founded on community practices connected to medieval obligations. Modern agriculture has led to the disappearance of such practices, which survive today only in very few places, such as the present area. Here the system owes its permanence to the need to balance the needs of agriculture with those of sedentary grazing. It seems to reflect a silvo-pastoral conception of economy that earned recognition especially from the 1970s onward. Even today, fields here are cultivated in two "shifts" (*veci*). A "full shift" of barley is alternated with an "empty shift" of potatoes. The crops are rotated from one plot to another according to a regular schedule including a long free-grazing period on fields where renewal crops are to be sown.

As regards integrity, the whole area still retains exceptional landscape values. The fields are surrounded with extensive pastures and woods, and are cultivated extensively employing traditional crops and practices. Especially prized crops include pulses (lentils, chickling vetch), cereals (spelt, Solina wheat, barley) and potatoes. The lentils of Santo Stefano di Sessanio are recognized as a Traditional Food Product by the Ministry for Agricultural, Alimentary and Forest Politics, and they also are a Slow Food Presidium. Most of the local food products, which are increasingly employed in the expanding local tourist business, are actively promoted and placed under legal protection. The open fields lie at a certain distance from inhabited centers. There are often still evident signs of the removal of rocks, which are piled in large mounds called *macerine*. Roads and paths are kept down to a minimum, the

Fig. 18.2 The open fields of the Baronia di Carapelle

plots still retain their elongated shape, usually perpendicular to the overlying slope to favor the descent of humus.

The vulnerability of the area is determined by the decline of agropastoral activities, which is leading to the abandoning of the cultivated fields and the consequent thriving of wild fauna. Notably, every year some of the higher altitude fields are relinquished. In the valley, instead, the main risk is crop homologation. Many minor man-made structures have completely disappeared. The momentum of the great emigrations of the early twentieth century is still not completely spent: between 1991 and 2001, the communes in this district registered an average emigration of 20 %. The rural economy is also gradually but evidently on the decline: In the same period, the number of farming businesses in the commune of Castelvecchio Calvisio was reduced by one half (Fig 18.2).

18.4 Terraced Fields and Hills of the Majella (42° 10′ 58″ N; 14° 04′ 16″ E)

This is a terraced silvopastoral landscape extending over about 700 ha. It is mainly composed of artificial meadows, some privately, others commonly owned, grading down to the valley. Crops include spelt, olive trees, grapevine and fruit trees. Cheese and honey are also produced. The area falls within the municipalities of Roccamorice, Lettomanoppello, and Abbateggio in the province of Pescara, the landscape is protected according to the landscape law n. 1497 of 1939. It can be reached by exiting

Highway A25 at Alanno-Scafa and driving up towards S. Valentino in Abruzzo Citeriore and Roccamorice. From Roccamorice one drives further up in a SE direction, towards the Eremo di Spirito and Passo Lanciano.

The area is part of the Majella mountain range, a massive limestone formation that emerged 5 million years ago. The Majella is characterized by a series of summit plateaus with gently sloping profiles due to glaciation, and long, harsh valleys cutting through the mountains from summit to foot. Our area lies on a broad slope descending from the Maielletta (1,995 m a.s.l.) to the Pescara River Valley, between the Santo Spirito and Sant'Angelo Gorges. These are tectonic gorges bearing the marks of both fluvial and glacial action, with long, deeply incised ravines. The slope has a constant, moderate grade with emerging rocks and karstic morphologies.

The area owes its significance especially to its terraces and dry-stone enclosures and huts, which combine with the local natural features to make this area one of the most remarkable landscapes in Italy. It was known ever since remote times for the asphalt deposits of Lettomanoppello, where the Amalfi Republic procured bitumen for the caulking of its ships in the twelfth century. By the time of the Lombard invasions, transhumance towards the plains had already become a significant element of the local economy. Two important hermitages, San Bartolomeo di Legio and Santo Spirito, where built in the area around the year 1,000. Abbateggio was erected around the ninth century, while Roccamorice is apparently later. The anti-feudalism laws and Provisory Cadaster of the first half of the nineteenth century, along with demographic growth and the crisis of transhumant pastoralism, put a strong pressure on the poorer farmers to wring tiny commonly-owned holdings out of the mountain. The rocks gathered as part of the reclaiming of fields and pastures, to exploit the thin layer of fertile soil and the sparse grasses growing among the limestone outcrops, provided building material for a high number of constructions, including about 300 huts called "tholos". These dry-stone constructions are probably patterned after the *trulli* of the Puglia region, and hence a testimony of developing relations with Puglia in the nineteenth and twentieth centuries. Abruzzan shepherds sought refuge in the se buildings during the transhumance period, as they led their flocks up from the Puglian countryside to the mountains of Abruzzo. The earlier ones are built hastily and cheaply, but soon their construction began to gain in order and precision. The initial small shelters gave way to buildings where whole families could spend the whole summer. These typically encompassed a two-story sleeping hut, a storehouse for produce and tools, and a milking area, preferably covered. The whole complex was enclosed within a high enclosure wall. The area was renowned for the working of Maiella white and black stone. Constructions in this material are widespread in the area and one of its most distinctive features.

The landscape still shows a high degree of integrity. The most significant and best preserved examples of terraces and huts can be found near the Civita Hill, where the most elaborate building types are found. Here the constructions are still in a good state of preservation. Agricultural activities are concentrated further downhill, the result being contrasting landscapes and different forms of economic and agricultural management, with a sharp transition from pasture to shrubland, and from shrubland to intensive cultivation. On the older terraces, pastoral activity is residual.

Fig. 18.3 The *tholos* of the Majella mountains are one of the many different types of stone buildings dotting the Italian rural landscape

The vulnerability of the area is mainly due to land abandonment, which began around the middle of the twentieth century, leading to a slow deterioration of the dry-stone structures and of the whole agricultural landscape. Rural tourism in the area does not appear to be having a negative impact on its integrity, partially because the area lies within the Majella National Park. However, in 2007 the commune of Roccamorice requested its removal from the Park area, accusing the Park management of hindering, with its excessively conservative attitude, the anthropization of the area. Notably, Roccamorice has challenged the Park management's decision to close off the car road from the junction at an altitude of 674 m a.s.l. leading to Colle di Fiume, Colle della Civita, Colle Remacinelli, and Fonte Tettone. The leaders of the local community regard this road as a fundamental resource for the socio-economic development of the area. The issue is up for debate in the Italian Parliament (Fig 18.3).

18.5 Olive Orchards of Loreto Aprutino (42° 26′ 00″ N; 13° 59′ 00″ E)

This area, extending over about 800 ha, lies at 294 m a.s.l. in an inland hilly zone, half way between the Adriatic Sea and the Gran Sasso d'Italia mountain range. The district, which extends all around the village of Loreto Aprutino, is characterized by olive cultivation, partly on terraces and adjoining vineyards.

The area owes its significance to an olive orchard landscape that retains traces of several historical transitions, from Italic settling in the area back in the fifth or fourth century B.C. to the industrial and mercantile transformation of the local agriculture from 1870 onward, which made this area one of the most productive in Abruzzo, where it is regarded as the main center of oil production. The earliest attestation of the settlement of Loreto dates back to the year 884, when it is mentioned among the holdings of the Abbey of Montecassino. In 1071 it became a Norman County. The first of a series of Counts who ruled the village was Taxio Normannus, known as Dragone Tassone. Part of the olive orchards are arranged rationally, with the trees placed at preordained distances from one another, which are the same all over the area and hence impart a sense of regularity to the landscape. The main crop of the ca. 40 agricultural businesses in the area is an olive tree of the "Dritta" variety, which spread at the beginning of the nineteenth century. "Dritta" olive trees have long outreaching branches and a not too dense foliage. They are of middle size and stoutness, and produce a limited amount of wood. The leaves are dark green and glossy, and have a prickly tip. Olive trees of this variety are one of the most ancient species in Abruzzo. The local intensive cultivation methods and business forms are rooted in the dynamic traditions of the local farmers, who watch over the evolution of the area with the objective of exporting their oil abroad. Being located in the Vestina area, in the Tavo basin, the olive orchards have the benefit of an elaborate irrigation system. Other elements adding significance to the area are the Castelletto Amorotti, which houses the Museo dell'Olio (where a nineteenth-century oil factory, one of the earliest in the commune, is displayed), and the church of St. Francis (thirteenth century). On a hill in front of the historical center is the church of S. Maria in Piano (twelfth century). Also remarkable is the Museum of Farming Civilization, with more than 900 artifacts from the Vestina area.

As regards integrity, the twentieth-century industrialization of agriculture had little impact on the local olive-tree landscape. Thanks to the persistence of old cropping systems, the presence of centenary olive trees, and the preservation of traditional land uses, the area manages to sustain a high-yield rural economic activity with a low landscape impact. The most significant innovations were the increase of olive trees per hectare and the replacing of animal-driven oil presses with hydraulic ones. The cultivation and pruning of the trees and the harvesting of the olives are largely carried out under the prescriptions of the "Aprutino Pescarese" Protected Designation of Origin regime (granted in 1996) for the production of extra-virgin oil, which include specifications of the physical characteristics of the olives, inter-tree distances, and maximum production (9,000 kg per ha), and also regulate the use of picking machines, prescribing that the olives should be picked directly off the tree.

As regards vulnerability, the area does not appear to be impacted by uncontrolled building. Landslides have occurred along some stretches, and a slow process of erosion is visible; these issues have been brought to the attention of the Consorzio di Bonifica Centro dell'Abruzzo. The 2009 earthquake also caused some damage. Studies on the waters of the Tavo, which gave rise to a debate between the WWF and the municipality, indicate pollution of groundwater and malfunction of local depurators. Irrigation from these sources may hence undermine the quality of local

Fig. 18.4 The landscape of Loreto Aprutino shows the persistence of old cultivations and centenarian olive trees

farm products. Further vulnerability could derive from excessive intensification in olive-growing involving the introduction of technologies that modify tree structure or orchard layout (Fig 18.4).

18.6 Fucino Plain at Ortucchio (41° 57′ 54″ N; 13° 36′ 43″ E)

The area encompasses a portion of the Piana del Fucino (Fucino plateau) within the commune of Ortucchio, a center of over 1,500 inhabitants lying southeast of the Piana, about 680 m a.s.l. The municipal territory extends over about 35.6 km^2, with an agricultural surface of at least 2,000 privately owned hectares. The Piana del Fucino is a plateau (650 and 680 m a.s.l.) surrounded by mountains, the most important being the mainly calcareous Velino and Sirente to the north. The Piana, which lies within the Marsica area, is a tectonic depression lying next to a fault. Its floor is mainly composed of loam and sand, which becomes increasingly clayish towards the center and coarser-grained towards the edges.

In the history of Italy, the draining of Lake Fucino, only completed in 1878, ranks among man's greatest efforts to establish a Promethean domination over nature. It was a controversial undertaking, but one that nevertheless produced significant historical and socioeconomic results. In the early ninth century B.C., the level of the Fucino rose markedly, submerging and causing the definitive abandonment of

Protovillanovan villages located at the present-day sites of Ortucchio and Luco, on the banks of the lake. The first attestation of the name "Ortucchio" dates back to the eighth or ninth century, when it appears as "Hortucla", a term closely connected with the Latin *hortuculus/horticulus*. Lake Fucino was the third largest lake in Italy, extending over 150 km^2, and was rich in fish. The first plans to drain date back to Caesar, who promised to do this to provide a source of food for Rome. The emperor Tiberius allegedly also planned to drain the lake. It is the emperor Claudius, however, who finally decided to undertake the work, which required 30,000 slaves and 11 years. They did not, however, achieve the desired end. The effluent canal dug by Claudius' men only managed to reclaim land from the water for a short period of time. Shortly thereafter, neglect and lack of maintenance of the canal allowed the lake to regain to its original extension. A homonymous castle was built near the village at the behest of Antonio Piccolomini, on the site of an earlier fortress some vestiges of which survive. The castle was finished in 1488, as proclaimed by the inscription above the main entrance. The village and castle stood on a small peninsula extending out into the waters of the lake, which in the following centuries turned into an island. In 1854, Alessandro Torlonia decided to start land reclaiming works. At the time the lake extended over a surface oscillating between 15,000–16,000 and 40,000 ha. The works included the draining of the lake and reclaiming of the land, as well as the digging of a dense network of canals with a total length of 285 km, 238 bridges, 3 locks, and 4 sluices. Following farmers' protests after World War II, the agrarian reform of 1950 assigned the agricultural land of the Fucino to residents of the surrounding communes and to 5,000 landless families who had immigrated from the coast after the draining of the lake. The latifundist Torlonia was forced to relinquish his estates, and the Ente Fucino was established. The drained basin of Lake Fucino consists of 14,005.90 ha of farmland divided into 497 holdings of 25 ha each. The draining brought benefits, but also high environmental costs. Before the land reclaiming and the agrarian reform of 1950, the area had had a damp but not too cold winter climate allowing the cultivation of grapevine, and olive and almond trees. Since the late nineteenth century, the climate of the Piana has become continental, with harsh winters and frequent snowfall. The typical crops of Mediterranean-climate areas could hence no longer be grown. Wheat and especially sugar beet thus became the dominant crops in the drained area and in the areas near Ortucchio. Today, however, sugar beet farming is less important in the Fucino plateau than it used to be 20 or 25 years ago, ever since the major sugar refinery of Avezzano, established at the end of the nineteenth century, was closed in 1987. The area's main crops today are the "Fucino Carrot" (Protected Geographical Designation), whose cultivation began in the 1950s, cultivated on more than 2,000 ha with a yearly yield of 150,000 t (30 % of Italian production, 1 % of world production); the "Fucino Potato" (Protected Geographical Designation), more than 3,000 ha; and garden vegetables (radish, lettuce, fennel and cauliflower), more than 4,500 ha. Thus, over the years the Piana made a transition from the fishing and orchard area it had been until the reclaiming to an area almost entirely devoted to vegetable-growing, a very profitable branch of the primary sector. Seventy percent of the farming businesses of the Piana are estimated to be of small to middle size (less than 15 ha of farmland), and only 5 % have surfaces between 50 and 100 ha. In spite of this fragmentation, the local agriculture is thriving and remunerative.

Fig. 18.5 The features of the Fucino plain are unique in the Italian landscape

As regards landscape integrity, the area is certainly unique in the Italian agricultural landscape, due both to its cohesion and to the clear-cut delimitation of its perimeter. Furthermore, such a level landscape is an anomaly in the Apennines. The surface devoted to cultivation appears extremely vast and harmoniously laid out. Especially from above, what strikes the viewer is the neat arrangement of agricultural areas into hundreds of almost identical rectangular plots divided by long rectilinear roads, which are sometimes dotted with trees in the proximity of canals. Finally, the types of crops, none of which is arboreal, are homogeneous, and this further enhances the uniformity of the landscape. Industrial buildings such as the Piero Fanti space center, opened in 1962, detract only slightly from this compact aesthetical appearance.

As regards vulnerability, the climate change caused by the draining of the lake led to a transition from traditional to intensive agriculture requiring a large quantity of water both for irrigation and for transformation and packaging processes. This has determined an unsustainable consumption of water not only at Ortucchio, but in the whole plateau, where the wells tend to go dry by the spring or summer. The feasibility of this kind of agriculture may thus be challenged in the future. Over the last few years the Abruzzo regional government has repeatedly sought to find a solution to this crisis. The strategy of improving of canal maintenance and opening of new wells, while commendable, seem inadequate to face the scarcity of hydraulic resources, as do existing plans to capture rainwater in artificial lakes, which appear contradictory when one looks at the history of this area. A rationally reprogramming of cultivation and the implementing of water-saving measures would seem to be a more viable strategy (Fig 18.5).

18.7 Plateaus of Aielli (42° 27′ 05″ N; 13° 16′ 59″ E)

This area is a vast plateau covered with meadows, fields and wooded pastures, extending over about 500 ha above the towns of Pizzoli and Barete, in the province of L'Aquila. The area is included in the Gran Sasso and Monti della Laga National Park, while the landscape is protected according to the landscape law n. 1497 of 1939 and n. 431 of 1985. The Piani di Aielli can be reached from either town. From Pizzoli, a narrow dirt road, as scenic as it is dangerous for its lack of guardrails, goes up more than 10 km and then down again towards Montereale. From Barete, instead, a narrow mule track goes through Pietra Liscia, Le Otarelle, Fondo dei Faggi, Grotta Nera, Sasso Rosso, La Madonnella, Piedi Le Prata, Lo Stretto, and Colle Liberato. The Aielli Plateaus are bounded by the Conca di Montereale to the north, the Cafasse Valley and Capannelle Pass to the east, and the Aterno Valley to the west and south. The area alternates natural meadows, usually small cultivated fields, uncultivated areas, and karstic zones. Here one distinguishes between "upper" and "lower" Piani, at different altitudes. The upper Piani, about 1,300 m a.s.l., are more arid and lack streams. Here livestock breeders, mainly from Pizzoli, graze their herds. The "lower" Piani, instead, about 1,180 m a.s.l., have abundant springs (Acquatina, Sbollente, Riola, Capo Croce) and drinking troughs used by the Barete shepherds for their flocks. In much of the area the soil is calcareous and has low fertility. Small karstic hollows called *fonnate* or *fonnatelle* are frequent. The erosive action of rain and snow and the exposure of the slopes have revealed the underlying rock in many points. The slopes of Mount Mozzano, instead, are covered with pine, Turkish oak and beech.

The area owes its significance to the historical persistence of a fascinating landscape of pastures and meadows connected with the transhumant breeding tradition of Pizzoli and Barete. Human presence in the area is documented from the Bronze Age (ca. 3,500 years ago) onward. However, it probably dates all the way back to the Paleolithic, since Neanderthal hunters are attested in the nearby Fucino area as early as 150,000/70,000 years ago. They came up from the Adriatic and Tyrrhenian coasts in the warm season to the high hunting grounds of the Marsica. The name "Aiello" is a common Italian toponym derived from the Latin *agellus*, a diminutive of *ager*, "field", and bears witness to the area's importance in Roman times. The vestiges of a road as early as the late third century B.C. are observable on the crags of the Aielli Ravines. Agricultural production in the fields of Aiello between the Valeria and Lake Fucino was boosted with a new centuriation in 149 A.D., a testimony that by then an agricultural and pastoral economy was well established in the area. In the twentieth century, from April to October the populations of Barete and Pizzoli grazed their sheep, cows and horses, and rotated crops such as barley, wheat, and medicinal herbs for the rest periods, or lentils, *cicerchie* (grass pea), chickpeas and potatoes. The area provides a significant example of "vertical migration". In autumn the herds and flocks began their descent to the pastures at the bottom of the Aterno Valley. Cultivated plots were often delimited by foliage or dry-stone walls called *macere* or *macerine*, made from rocks cleared out of the fields. These enclosures protected the crops from the herds or flocks. Over the centuries a group of stone, brick and mortar

Fig. 18.6 The Aielli plateaus preserve a fascinating landscape of pastures and meadows connected with transhumance

houses, commonly known as the "Casali di Aielli", grew along the winding road that runs through the Piani. They are rectangular in plan, with one or two stories, and unplastered outer walls. In the two-floor houses, the stable is on the first floor and the living quarters on the second. The two floors are not connected: Access to the second floor is provided by the natural slope or a dry-stone ramp. The ground floor includes a sheepfold, a stable, and a storeroom, while the hayloft is on the second floor, next to the living quarters. There was often also a small threshing floor. The single-story houses have an even simpler room arrangement. Some of the houses still have their characteristic small apertures for the aeration of the interior. Thus, the Aielli houses have essentially retained their traditional architecture, although today they are mostly uninhabited and some are going to ruins. Some are still used by shepherds as seasonal shelters. Along the road there are also some concrete fountains and drinking troughs. Movable wooden mangers for horses are placed at passages from one field to the next.

As regards the integrity of the Piani di Aielli, today the ribbon-shaped structure of the open common wheat fields is still visible, alongside the mown fields where livestock is raised and small potato and vegetable gardens. The boars living in the area, whose population is on the rise lately, often damage these cultivations and discourage farmers from extending them, in spite of fences and electric wires. The sparse tree covering, consisting of small groves and isolated specimens, enhances the charm and uniqueness of the area. The Piani di Aielli still retain the typical historical

structure of treed pastureland, which today is receding all over the Apennines. Cows left grazing free by their owners and herds of horses coming down towards the Barete plateau at the first winter snows ensure pasture maintenance, and animate a silent and awe-inspiring landscape.

As regards vulnerability, over the last few years the gradual abandonment of agriculture in the highland fields of the Apennines and of sedentary livestock raising in the mountain pastures of the Aterno has caused a decline of human presence in the Piani. Some plots have been abandoned and the dry-stone walls are no longer maintained. Until a generation ago, as the shepherds who are left recollect, all the houses were inhabited and almost all the plots were cultivated or used as pastures. The number of flocks has also diminished (Fig 18.6).

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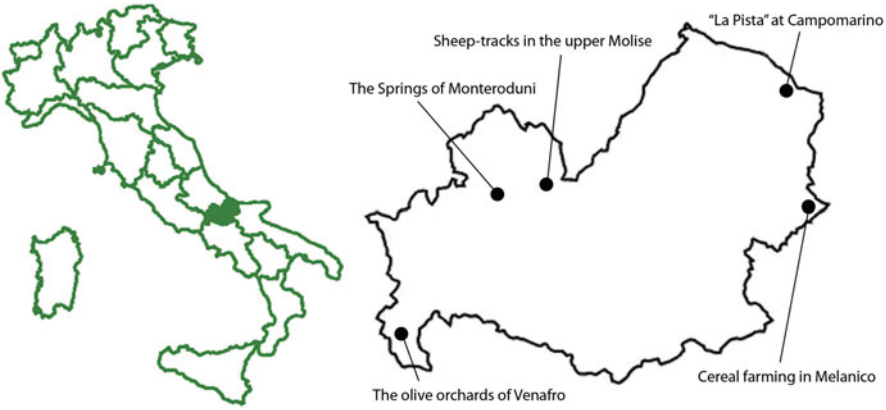
Chapter 19
Molise

Piero Bevilacqua



19.1 Introduction

Molise is a secluded Italian region, with a rugged and mostly mountainous terrain, few plains, some of which marshy, and few plateaus. The soil is generally poor and shallow. However, in Molise farmers have managed to develop their own distinctive agriculture, centered especially on cereals, and, on the century-old practice of transhumance, or migrant animal-farming, bringing sheep to and from the plains of the nearby Puglia region, using a thick network of tracks. Molise is traditionally associated with neighboring Abruzzi, with which it shares a common landscape and history, while maintaining its own distinctive profile. Nowadays, it offers an interesting mosaic of traditional agricultural landscapes, especially in the inland areas. Here, we find the typical view of the latifundium, or large landed estate, in

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which pastures and cereal fields alternate over vast areas, among hills and small plains.

Among the wheat areas that for centuries have dominated this countryside we have chosen the area of Melanico. Notwithstanding the land reform of the 1950s, which divided up the latifundium, adding vegetable gardens and olive orchards in the proximity of rural houses, much remains of the old landscape. A testimony of traditional peasant polyculture is found in the land of Monteroduni. In this area, the presence of a system of water springs made possible the development of irrigated agriculture, based on wheat, fodder, vegetables and fruit. The land is subdivided into many small properties as evidenced by the thick network of borders between holdings. Local economy seems to easily achieve a balance between market and self-consumption. Peaches are an important product and there is a well-known local variety. The land still shows evidence of the ramified network of canals serving the various holdings.

Among the various areas where fruit-trees are grown we chose to focus on the olive orchards of Venafro. These orchards extend from the plain to the beginning of the steep slopes of the overlooking mountain, and are often located on rocky terrain. The local olive oil has been known and appreciated since the days of old and we find references to it in the works of Columella, Horace, Varro, Pliny the Elder, Cato and Juvenal. A legend says the olive-tree was introduced to Venafro by a certain Licinius, perhaps one of the many Roman veteran-farmers, after whom the local "Licinian" olive is named. The most famous oil of Venafro was the *aurinus*, which was made with Licinian olives and thus named for its color (from Latin *aurinus*, "golden.") Quintus Horatius Flaccus (65–8 B.C.) in an ode describes Venafro as verdant because covered with olive groves, while Horace, in one of his Satires celebrates a sauce made of saffron and special herbs, with the oil of Venafro as mandatory ingredient. Because of its historical, economic and scenic importance, the entire area is to be included in a Regional Olive-Tree Park. Here, one finds many monumental olive-trees, some of them with a circumference of almost 6 m. The olive orchards of Venafro can be at times as thick as woods. They grow on terraces supported by dry-stone walls. This aesthetic aspect of the traditional scenery bears also witness to the work done by farmers to control the hydro-geological features of the land and properly maintain it. The notion of "rural park" seems particularly suited to the area, providing an adequate context to these forms of agriculture, which do not fit the criteria adopted in traditional parks.

Small parts of the Molise region are on the sea. In these areas, both in the small plains and in the lower hills, the mitigating power of the sea has made possible the development of an agriculture less hampered by problematic environmental conditions. Within this area a particularly significant agricultural landscape is found in the area known as "La Pista" in the municipality of Campomarino. In this flat area, the original large estates have been subdivided into small holdings where nowadays farmers grow vegetables, olives and fruit. Both the shape of the fields and of the houses bears witness to the continuing vitality of family-based agriculture. This harmonic landscape is free of the monotony of monocultures, while making human presence possible, by providing sufficient revenues. The sheep-tracks in the mountainous area

of the Molise region, in the municipalities of Colemeluccio and Montedimezzo, include part of the Celano-Foggia sheep-track. They partly extend in the territory of two natural parks which have been declared biosphere reserves by UNESCO. The area is a fragment of an incredibly ancient economy, centered around transhumance, which surely predated the Roman period. Migrations took place in the autumn and spring, when large flocks of sheep went by in the direction of the Tavoliere plain in northern Puglia or returned towards the Apennines. The area is typical of mountainous Molise with ample pastures dotted by woods and by fields where corn, pulse, potatoes and spelt are grown. Notwithstanding the decline of transhumance and of animal farming in general, the pastoral landscape maintains a strong integrity, favored also by the mainly public ownership of the land. The preservation of these areas is a particularly urgent problem, because they are subject not only to the decline of animal farming but also to the advance of the forest, which threatens to alter the traditional identity of this landscape, as elsewhere in Italy.

19.2 Cereal Farming in Melanico (41° 43′ 00″ N; 14° 59′ 00″ E)

"The granary of Molise" is the traditional nickname of the town of Santa Croce di Magliano, in the province of Campobasso. It refers especially to the cereals of the locality of Melanico. The locality of Melanico extends for about 950 ha of level ground in the south-east area of the municipality of Santa Croce, and is bordered by the torrent Tona and the river Fortore. It can be reached from the town of Santa Croce following provincial road SP 166 and then turning onto SP 148. Melanico also includes the locality Abbazia, so-called for the remains of an old abbey. The altitude is between 100 and 150 m a.s.l. The terrain is sandy with significant argillaceous loam rock strata and scarcely visible stratification, with occasional presence of macrofossils.

The area is characterized by historical presence of extensive cereal cultivations, still largely dominant compared to forage and vegetables. The late-medieval settlement of Santa Croce di Magliano was positioned in the locality of Colle Alto, at a short distance from Melanico. Since that time, common rights applied to the area, a tradition that lasted till the mid-twentieth century. The land was publicly used for growing wheat and to a lesser degree as pasture land. The *Catasto provvisorio* ("Provisional land register") of 1815 states that at the end of the nineteenth century almost three quarters of the extra-urban land of the town were used for crops, with no fruit-trees and few specialized cultivations; the rest of the land was pasture. The extension of the woods was very limited, unlike in the adjacent municipality of Rotello, where they covered almost one fourth of the surface. The century-old tradition of cereal farming has left its mark on the landscape, which is characterized by large open spaces and enriched, starting from the 1950s, by the presence of small olive orchards. Between 1860 and 1955, local populations and the Administration of Santa Croce di Magliano, through constant lobbying, put pressure on the owners to

Fig. 19.1 The landscape of Melanico is characterized by historical persistence of extensive cereal cultivations of early medieval origin

comply with common land rules and to distribute the land, which they were forced to do in the mid-1950s with the Land Reform. The century-old controversy on common land rights included the right to levy taxes on the forage for the animals that during the winter were taken through the area from Abruzzi.

The landscape too changed on account of the Land Reform, which caused the lands of Melanico to be subdivided into 28 holdings of 6–8 ha, on each one of which a red-brick rural house was built. These rural houses of the Ente Riforma, the body responsible for the Land Reform, had two stories: the stables and the kitchen were on the bottom floor, while upstairs a single bedroom was found. Houses had a small oven and sometimes a hen-house and a pigsty. The Ente Riforma also established a school in Melanico with attached a small chapel. Almost all those who were assigned a holding had a well built for domestic use. Notwithstanding the fragmentation of the property, the cultivation of cereals continued, though integrated by small olive orchards and vegetable gardens in the proximity of the houses. The rest of the land, consisting in over 700 ha, remained instead the property of the old owner. The landscape of Melanico is still rather homogeneous, well-maintained and characterized by the cultivation of durum wheat and, to a lesser degree, tomatoes and sugar-beets. The landscape is remindful of the plains of the nearby Tavoliere delle Puglie.

The vulnerability of the area consists in the danger of further subdivision of the land. After the privatization of the land, with second and third-generation owners, the small holdings assigned by the Ente Riforma have been further subdivided. Further fragmentation could make agriculture unprofitable. Furthermore, in this area of Molise, the scarcity of water in certain periods of the year causes low yields, leading farmers to give up agriculture. For these reasons, farms have sometimes been transformed into simple rural residences, inhabited only occasionally by families who live in town. The majority however has been simply abandoned their homes. Even when the holdings have been acquired by new farmers the houses are rarely used. The large estate that included the majority of the land of Melanico, instead, has retained its integrity. The Molise region is discussing a project that calls for the creation of an aqueduct to take the water of the artificial lake of Liscione or the Damn of Occhito, to the lands of Melanico and of Piano Palazzo, in the municipality of Rotello. The Lake of Liscione provides water to the north-eastern part of Molise, while the Damn of Occhito, on the river Fortore, is on the border with Puglia and provides water mostly to the land of the Tavoliere delle Puglie (Figs. 19.1, 19.2).

Land use 2010	Surface (ha)	Surface (%)
Water body	0.71	0.03
Urban area and courtyard	14.83	0.64
Arboricolture	4.34	0.19
Shrubland	22.35	0.97
Mineral extraction site	1.01	0.04
Broad-leaved forest	77.94	3.38
Fruit orchard	2.23	0.10
Fallow	16.70	0.72
Olive grove	75.39	3.27
Vegetable garden	0.77	0.03
Pasture	67.68	2.94
Shrub pasture	16.92	0.73
Arable land	1988.63	86.30
Arable land with tree	4.72	0.20
Vineyard	10.21	0.44
Total	*2304.43*	*100.00*

Evaluating indices of landscape	
Number of land uses	15
Number of patches	847
Total surface area (ha)	2304.43
Average surface area of patches (ha)	2.72
Average surface area of arable land patches (ha)	3.00
Average surface area of pasture patches (ha)	4.00
Hill's diversity number	1.95
Class of landscape integrity (I–VI)	VI

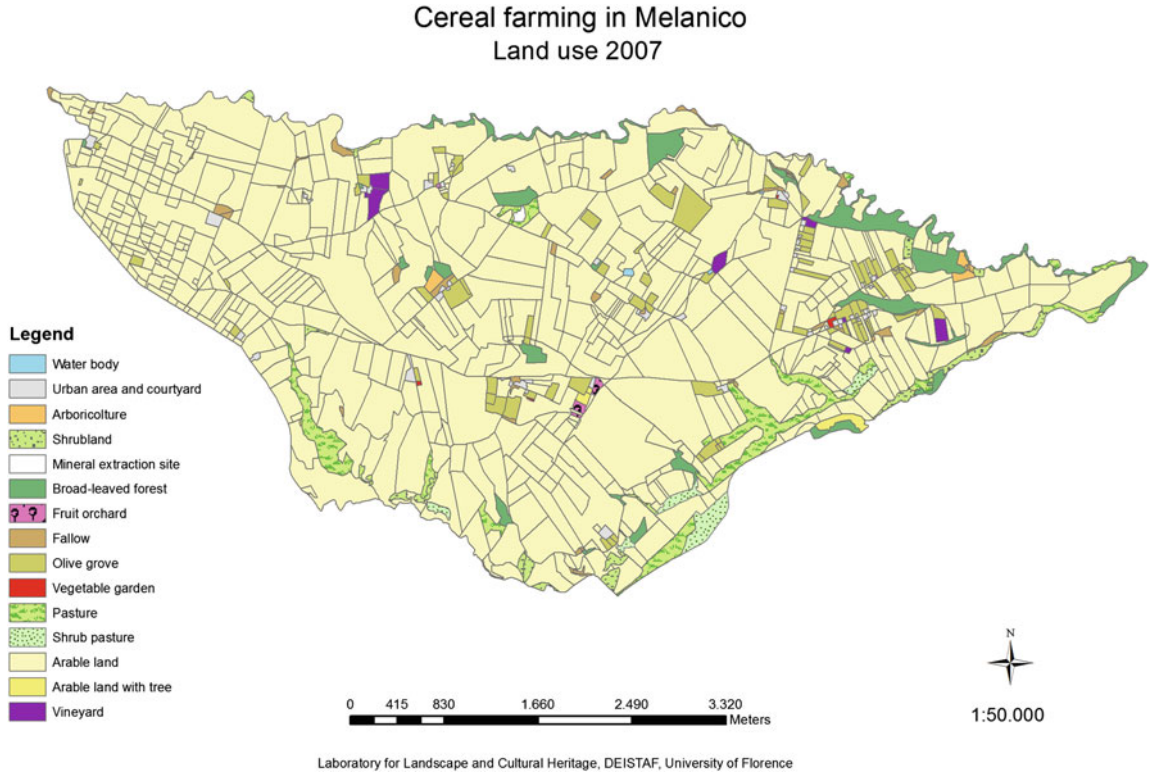

Fig. 19.2 The area is characterized by the historical presence of extensive cereal cultivations. Arable land clearly marks the area, occupying the 86.3 % of the whole surface, thus, the integrity of the landscape can be considered very high. In this case, the introduction of a higher diversification of crops, as suggested by some environmental policies, would degrade the integrity of the historical landscape

19.3 "La Pista" at Campomarino (41° 56′ 00″ N; 15° 03′ 21″ E)

The mosaic of cultivations of large estates, typical of the twentieth-century, still characterizes the locality of "La Pista," which extends for about 400 ha in the municipality of Campomarino, in the province of Campobasso. The area can be reached taking state road SS 16, going through Campomarino towards Serracapriola, in Puglia and taking a left after the road for Portocannone. It can also be easily reached following the E2 road, which skirts Campomarino. About 3 km from the town take the road built for the reclamation in the direction of Ramitelli, and go over the bridge on the Bologna-Bari toll-road. The area, located between the localities of Lauretta (so-called for the abundance of laurel bushes, in the past) and Mucchietti (the local name for a variety of shrub), is rather flat, except for a gentle decline in the direction of the ravine called Vallone delle Canne, which separates it from the locality of Cocciolete, closer to the town of Campomarino.

The significance of the area is due to its landscape, characterized mainly by vegetable gardens, and by small plots used for crops, vineyards, and olive, peach and apricot orchards. The locality is officially known as "Contrada Cianaluca", after the old owner Gianluca or Giovanni Luca Carriero, an eighteenth-century nobleman, but is commonly known to locals as "La Pista," a name dating to the 1943–1945 period, when Allied Forces constructed a runway ("*pista*") in the area. Vegetables have been constantly farmed in the area ever since the original latifundium was divided up into small holdings, in the course of the nineteenth and twentieth century. The process began in the first decade of the nineteenth century, when feudal rights were abolished. The land was divided up between the Town and a great landlord of the time, Scipione Di Sangro di Casacalenda. Later, in 1863, small quotas were meted out to 190 indigent citizens. A similar distribution was carried out in the 1936–1938 period, when the remaining forest area (180 ha) was assigned to the poor. The origin of the present rural settling instead dates back to the 1940s, when the last phase of the elimination of the sharecropping system took place. During that period, the owners, in order to avoid paying their sharecroppers compensations in money, gave them part of the land they worked, or offered their own, or sold additional plots of land. As a consequence, a small rural settlement quickly grew alongside the road. By the end of the twentieth century, the small holdings had become rather homogeneous, both in size and type of cultivation, and could sometimes be distinguished from neighboring properties only by the different direction of the plowing.

Between the road and the houses, one still finds small family vegetable gardens, established at the time of the first settlement, which still maintain a degree of integrity. Houses are symmetrically located on the two sides of the road, almost on the edge of the roadway, occupying a central position in the holding extending behind them. In the ex-feudal areas instead, grain farming was abandoned already in the early 1960s, after the creation of an irrigation system made more profitable cultivations possible: tobacco, first, later replaced by sugar beet and vegetables.

In this area a phenomenon which is rather uncommon nowadays occurred: though families were rather large there was not a gradual subdivision of properties as elsewhere in Italy. On the contrary, smaller properties were often combined through a series of arranged marriages. The families, often related, came from the Abruzzo region (Casoli, Atessa, the surrondings of Teramo) or the area of Benevento (Morcone and S. Agata dei Goti). The original houses were primitive structures offering a simple cover for people and animals, and barely sufficient for a single family. However, following the intense development of agriculture, they were redone and modernized.

The area, one of the more fertile of Molise, was not subjected to that fragmentation of property typical of coastal areas, due to the mentality of the locals who continued to attach a lot of importance to the land. Structural modifications to the houses has turned them into actual villas, but there is no foreseeable risk of an abandoning of agriculture or significant alteration of the old settlement. New generations seem to believe in the possibility of continuing to work on the farm while holding other jobs (Fig. 19.3).

Land uses 2010	Surface (ha)	Surface (%)
Water body	0.09	0.02
Urban area and courtyard	19.74	3.32
Arboricolture	0.12	0.02
Broad-leaved forest	5.44	0.91
Fruit orchard	53.19	8.95
Fallow	24.34	4.10
Olive grove	37.00	6.23
Vegetable garden	0.39	0.07
Arable land	222.57	37.45
Arable land with tree	0.59	0.10
Arable land with olive tree	13.05	2.20
Arable land with vine	0.39	0.07
Riparian vegetation	7.48	1.26
Road system	10.48	1.76
Vineyard	199.33	33.54
Vineyard with olive tree	0.15	0.03
Total	*594.37*	*100.00*

Evaluating indices of landscape	
Number of land uses	15
Number of patches	571
Total surface area (ha)	594.37
Average surface area of patches (ha)	1.04
Average surface area of arable land patches (ha)	1.07
Average surface area of forest patches (ha)	1.29
Hill's diversity number	5.16
Class of landscape integrity (I–VI)	VI

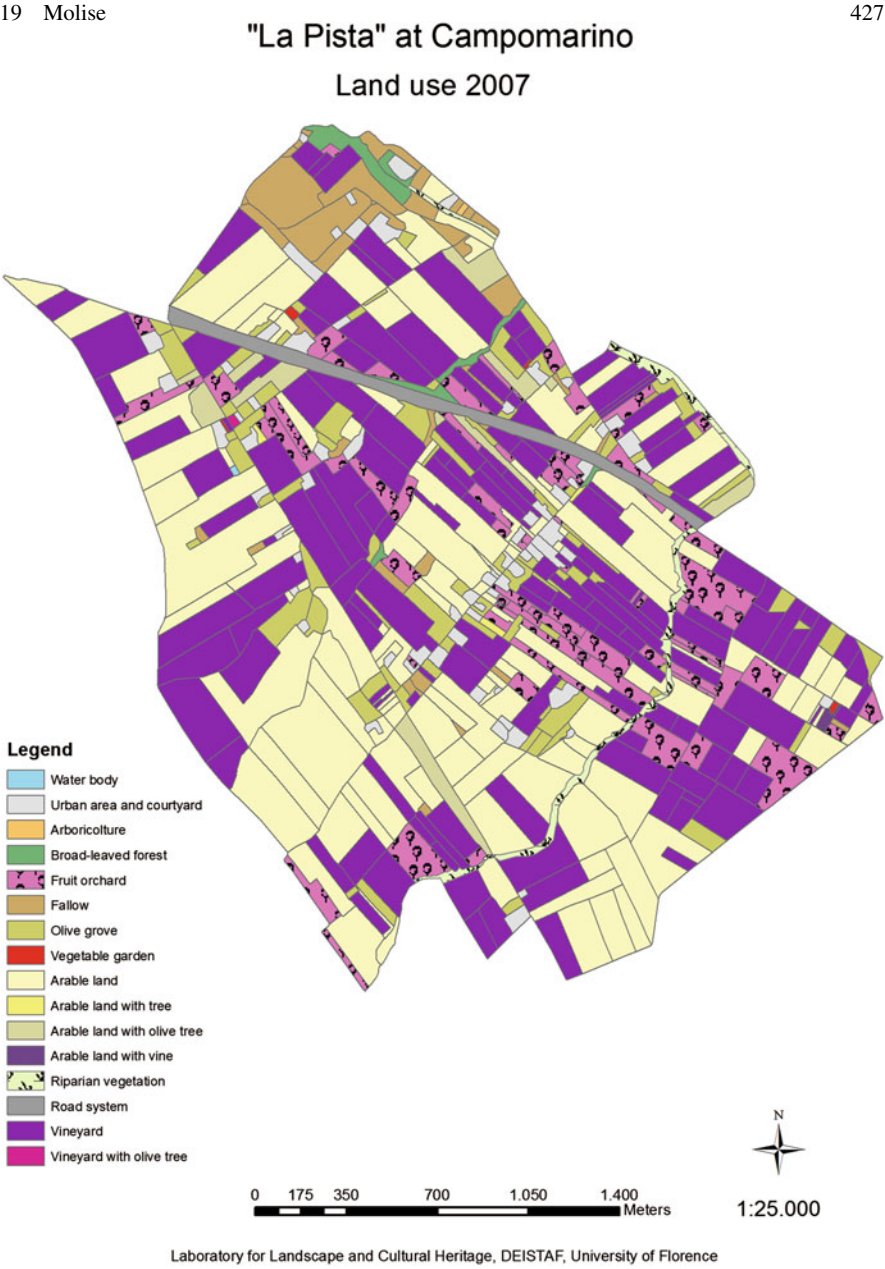

Fig. 19.3 The significance of the Campomarino area is due to the presence of different cultivations, such as small plots of vegetables gardens, arable lands, fruit orchards, vineyards and olive groves. 37 % of the area is characterized by arable land, and 33.5 % is covered by vineyards. Other land uses of the area are mixed cultivations (arable land with trees, arable land with olive trees and vines), orchards and vegetable gardens. The historic landscape shows a high level of integrity even in the landscape mosaic, which is still characterized by agricultural patches with a surface of about one hectare

19.4 The Olive Orchards of Venafro (41° 29′ 03″ N; 14° 01′ 52″ E)

This area consists of more than 500 ha of olive orchards in the municipality of Venafro, in the province of Isernia. The olive orchards extend from the plain to the beginning of the mountains, often on rocky and steep terrain. The area can be reached through many branches of state road SS 85 Venafrana, which goes from the town of Venafro to the Nunziata Lunga gallery, on the border with the region of Campania. The area lies at the foot of the mountain massif of Monte Sammucro, Monte Santa Croce and Monte Corno, and ranges in altitude between 150 and 600 m a.s.l. It is well-visible from the plain of Venafro. Other olive orchards are found in the valley, in numerous localities of the municipality of Venafro.

The significance of the area is tied to the presence of the traditional olive farming landscape, with orchards of aged olive trees sometimes clustering into woods. The olive oil from this area was known and appreciated since antiquity as we know from the works of Columella, Horace, Varro, Pliny the Elder, Cato and Juvenal. A legend says olive-trees were introduced to Venafro by a certain Licinius, perhaps one of the many Roman veteran-farmers, from whom the name "Licinian" used for a long-renown local variety of olives. The most famous oil of Venafro was the *aurinus*, thus named for its color (from Latin *aurinus*, "golden"), an oil produced from Licinian olives. Quintus Horatius Flaccus (65–8 B.C.) in an ode describes Venafro as verdant because covered by olive orchards, while Horace, in one of his Satires celebrates a sauce made with saffron and special herbs, with olive oil of Venafro as its mandatory ingredient. In another satire, in describing the dishes served for a banquet at the house of Nasidienus, Horace celebrates a moray cooked in Venafro oil obtained from the first pressing. In the Roman period, vineyards were also introduced, and wine grapes and olives have remained to the present day the dominant cultivation. The oldest olive orchards are in the mountainous area, in the locality of Tre Cappelle al Monte San Lazzaro. In the first half of the nineteenth century, the scholar Gabriele Cotugno wrote that "olive trees, which are so well-suited to it, and the excellent oil they produce, occupy, besides part of the plain, also the slopes of the mountains from Ceppagna to Pozzilli." In the course of the centuries, other olive trees were planted closer to the valley. Francesco Lucenteforte, primicerius of the Cathedral of Venafro, in his *Monografia fisico-economico-morale di Venafro*, published in 1879, lists the various type of olives found in the area, among which the *Aurina* or *Aurinella* (from Latin *aureus*, meaning "golden") so-called because of its golden color and high quality. Finally, between the nineteenth and twentieth century, olives began to be grown also in the level area towards the river Volturno. Nowadays the local oil is labeled as "Molise" DOP, and the Ministry of Agricultural Alimentary and Food Politics has included the The "*olive al naturale*" of Venafro in the Traditional Food Product list. Molise Region and the Commune of Venafro have started the procedure for the institution of a Olive-Tree Regional Agricultural Park, which calls for the identification of all monumental olive-trees, some of which are many centuries old and have a spectacular circumference. This is a very important initiative, which finally acknowledges the importance of the cultural features of the Italian landscape, which are largely prevalent compared to the exclusively natural ones, and seeks

Fig. 19.4 The landscape of Venafro combines the historical features of olive cultivations, dating back to Roman times, with the beauty of the mountain landscape of Molise

to counter the decline of agriculture, a decline which in protected areas is on the contrary often perceived as a positive phenomenon.

The landscape continues to largely maintain its integrity. The realization of terraces supported by dry-stone walls in the hilly areas has increased the historical interest of the landscape, besides helping ensure the hydro-geological stability of the land by reducing the risk of erosion. The value of the rural landscape is increased by the magnificent natural environment, characterized by vertical cliffs and the spectacular ridges of Mount Sammucro, Corno and Santa Croce. Recently, for the construction of a new road, which goes through the Volturno valley skirting the town of Venafro, hundreds of olive trees were uprooted, though many were replanted elsewhere. It is to be hoped that the establishing of the olive-tree park will help preserve and improve the integrity of the area.

The vulnerability of the land is largely a consequence of the decline of agriculture. While in valley areas, new olive trees continued to be planted and existing ones are properly maintained, due to easier farming conditions, on the slopes, especially in the least-accessible areas, olive orchards have been practically abandoned. Olive-trees are no longer pruned and are often surrounded by brambles and other weeds. The decline of olive-tree cultivation is also evident at first sight, in the way the silver-tipped green of olive-trees is increasingly encroached upon by the darker green of wooded areas. For the above reasons, the area, especially the one between the state road and the mountain slopes is vulnerable to fires, sometimes of

significant extension. For example, in the summer of 2007, a great fire destroyed many olive-trees. The lack of maintenance involves also dry-stone walls, many of which are now discontinuous, partially in disrepair and lower than they used to be (Fig. 19.4).

19.5 The Springs of Monteroduni (41° 31′ 00″ N; 14° 10′ 00″ E)

The area of the Springs of Monteroduni is characterized by flat terrain of alluvial origin; it extends for 2,000 ha; there is an abundance of springs and canals have been constructed to serve the small holdings of the municipality of Monteroduni, in the province of Isernia. The area is at the foot of the Matese Massif, on the side that gently declines westwards towards the river Volturno. Its altitude ranges between 150 and 200 m a.s.l. The area can be reached following state road SS 85, and taking, between 30 and 33 km, one of the local roads on the right or left, or, alternatively, by following the provincial road Volturno-Pentrica.

The old town of Monteroduni dominates the valley from a hill. At the top of the hill, rises the castle of Monteroduni, one of the most beautiful castles of Molise for its architecture, its excellent condition, and for its position. During the Norman and Swabian domination, Monteroduni was a fief of the count's seat of Molise, and was used as one of the major strongholds of the county, according to scholar Giambattista Masciotta. The construction of the first stronghold on the hill, which replaced the *statio* of Ad Rotas, dates back presumably to the Longobard period, though no reliable archeological confirmation exists of this hypothesis. Inside the castle, there is a permanent exhibit of farm tools, bearing witness to the importance of local rural culture, centered on the agricultural exploitation of the many local springs. In 1193, the town was destroyed by the troops of emperor Henry IV and remained without water-works for about 800 years. However, many houses could rely on wells and reservoirs replenished by rainwater, which were used for household chores, while the various natural springs were used for drinking water. The various springs are connected in a unitary system. The most important springs are those of S. Nazzaro, Caprionero, Capotrio and Laguozzo. At a short distance we also find the spring of Campo La Fontana. The spring of Capotrio flows from the slopes of the hill on which the old town of Monteroduni is located, and supplies water to an aqueduct that branches out to the various small rural settlings. The spring is not constant and its flow decreases significantly during dry spells. In these periods, water is supplied by a nearby artesian well activated by an electrical pump. The area has a complex network of canals serving the various holdings, typical of the irrigation-based agriculture that has characterized this area of Molise in the last few centuries. The presence of springs has made possible the cultivation of wheat, forage, vegetables and fruit-trees over a long period of time, notwithstanding the fragmentation of the original estate. One of the main products of the area are peaches, of which there is a well-established local variety. The abundance of water attracted settlements since ancient times, starting with the Pentri Sannites. Until the mid-twentieth century, hemp was also cultivated, from which comes the local place-name of "Cannavine."

Fig. 19.5 The landscape of Monteroduni

Since 1911, irrigation is regulated by a "Code for the irrigation of the fields," issued by the Commune of Monteroduni, which applies to the entire municipality, but is particularly relevant to this area. The first true aqueduct of Monteroduni was planned in 1934, begun on March 18, 1935, tested on April 12, 1938, and fully operational by September 14, 1938. The main canals are property of the Commune, while the drainage canals and secondary canals are privately owned. "Since private citizens have no special rights or privileges in regards to the waters of the Commune"—states Article 2—"distribution must be carried out by supervisors with absolute impartiality, treating all owners and renters in the same way." The Code also regulates the usage of the springs by the various small rural villages of the municipality and the shifts assigned to each village.

As for the integrity of the area, the canal system serving the various vegetable gardens and cultivations are still well-visible. These canals often serve also as borders between properties. Even after the introduction of chemical fertilizers and the adoption of modern machinery, the types of cultivation have remained unchanged. The products of Monteroduni are marketed throughout the region and beyond, and this helps preserve its characteristics. The original rural architecture is also well-preserved, and consists of stone cottages and other rural buildings. Notwithstanding the construction of new houses, the original rural landscape has retained its integrity. In past decades, there have been repeated efforts to channel waters using small cement canals or forced draught cast-iron tubes, but high costs prevented the projects from being carried out.

The vulnerability of the area consists in decreasing canal maintenance, which could lead to a decline in the supply of water for irrigation. In 1981, a law was approved which cancelled many dispositions of the 1911 Code, among which the prescription that "all users of each locality must gather together and ensure that, before the start of their shift in annual irrigation, the canals and the drainage ditches be cleaned and fixed," and "their sides maintained to prevent the water from leaking or the flow from slowing down" (art. 17). Decreased canal maintenance could also lead to an abandoning of vegetable farming in favor of smaller fields of crops (Fig. 19.5).

19.6 Sheep-Tracks in the Upper Molise (41° 45′ 00″ N; 14° 23′ 00″ E)

The mountainous area of the Molise region is characterized by ample pastures interspersed by woods and by fields where corn, pulse, potatoes and spelt are grown. This agricultural landscape is well-exemplified by the localities of Collemeluccio and Montedimezzo, in the province of Isernia, which are connected by the Celano-Foggia sheep-track. The area extends for more than 3,500 ha and is located between two natural parks (*Riserve Naturali Orientate*), which have been declared Biosphere Reservations and included in the MaB (Man and Biosphere) program of the UNESCO. The area can be accessed from the highways of Fondo Valle Trigno and Fondo Valle Sangro, through a network of provincial and municipal roads that connect them to the various towns. The area is characterized by a network of country roads connecting the various holdings. From a geo-morphological perspective, the area is characterized by a series of plateaus located between 700 and 950 m a.s.l., characterized by calcareous-argillaceous rock and therefore a generally gentle surface, with the exception of some calcareous areas. Its northern boundary is marked by the Celano-Foggia sheep-track and its southern boundary by the Carpinone-Sulmona railway. To the west instead it borders with the "Prati della Signora" plain of Montedimezzo and to the east with the woods and pastures of the municipalities of Pescolanciano and Pietrabbondante and the "Abetina" of Collemeluccio.

The significance of the landscape is due to the presence of pastures and of the Celano-Foggia sheep-track, which is 110 m large and 127 km long and dates back to the time of the Sannites. It is one of the best preserved sheep-tracks of mountainous Molise. In past centuries, it played a crucial role in shaping the economic and social system revolving around transhumance, which characterized the entire area. Many signs of past human presence can be found along the sheep-track: drinking troughs, shrines, huts and inns, small nuclei of houses and villages. Many names of places are associated with transhumance. The settlements of Pescolanciano, Civitanova del Sannio and Montalto di Rionero developed in the proximity of the Castel di Sangro–Lucera sheep-track, and that of San Pietro Avellana in the proximity of the Celano–Foggia sheep-track. For this reason, the natural museum of Montedimezzo includes everyday objects of pastoral life, mountain farming tools and woodcutting tools. If the extension of the sheep-track has remained the same, its usage has

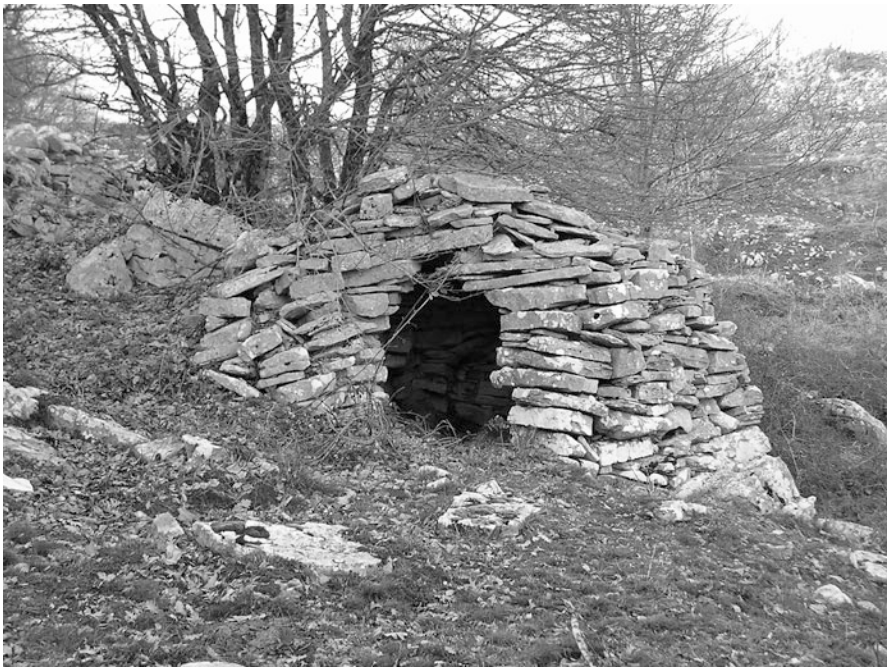

Fig. 19.6 The Celano-Foggia sheep-track, dating back to the time of the Samnites, is one of the best preserved in upper Molise. Along this track one can still see material evidence of pastoral life

changed. It would be certainly anachronistic to think of reactivating transhumance, other than for occasional cultural events celebrating local traditions. On the other hand, well-preserved sheep-tracks could be used for cultural tourism, hiking and school-children's excursions.

The pastoral landscape retains a strong integrity, favored also by the mainly public ownership of the land. Open areas are regularly mowed while wooded areas and pastures are maintained through forest management plans. The common-land use of the pastures and woods by residents, which is characteristic of municipally owned land, is similarly regulated, though the rights are nowadays seldom exercised. Private property, with few exceptions, is very fragmented and revenues are very low. Depopulation and the decline and sometimes almost complete disappearance of sheep-farming has caused a slow expansion of wooded areas at the expense of open fields, marginal areas, and abandoned pastures, compromising the integrity of the landscape. Even more rapid was the growth of shrubs on pasture-lands. Arable land has greatly declined as well as that used for forage.

The vulnerability of the area lies in the decline of farming and the expansion of woods into pasture land. The area is subject to landscape regulations and also well-controlled by local communities, but there are no concrete actions aimed at maintaining or recreating pasture land, also on account of regulations protecting wooded areas. There is an absence of effective policies that could make

it economically convenient for younger generations to continue working as farmers, in areas such as organic farming, animal farming, or eco-sustainable tourism. Only with such policies can this historically valuable rural and pastoral landscape be saved from the advance of the woods. The maintenance work on the traditional small stone refuges, the *tholos*, is also scarce.

Recently the Corpo Forestale dello Stato (Forest State Service), through the Territorial Office for Biodiversity of Isernia, has advanced a specific proposal for the Celano–Foggia sheep-track. Having received from the regional administration of Molise the free concession of certain sheep-tracks, a preliminary project has been elaborated to ensure sheep-tracks remains accessible. The project also calls for the restoration of an inn and some fountains (Fig. 19.6).

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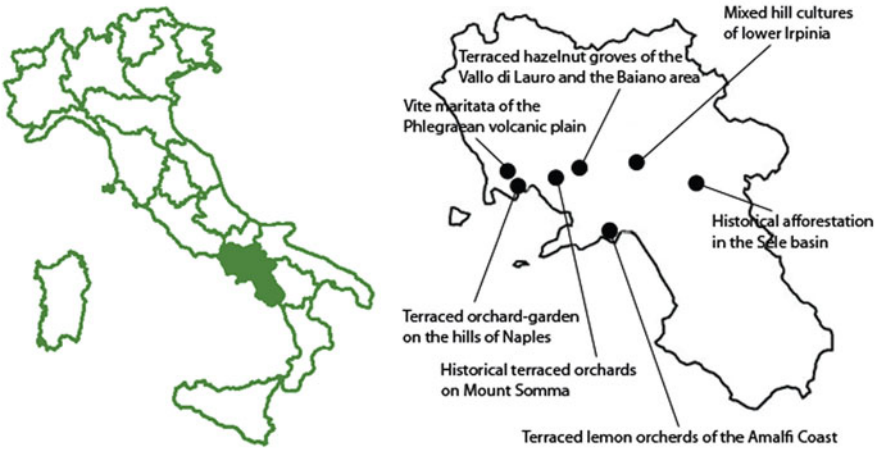
Chapter 20
Campania

Antonio Di Gennaro



20.1 Introduction

The Campanian landscape has always had a markedly agricultural character. The name *Campania Felix*—"Prosperous Campania", alluding to the fertility of its soil—originally designated the territory of the city of Capua in the Roman period. The importance of agriculture in the region was also emphasized under the Kingdom of the Two Sicilies, when it was called Terra di Lavoro(Land of Work). It is thus hardly surprising that, in spite of the deep social and economic changes of the last few decades, historical landscapes of great significance still survive in the 69 % of the regional territory still used—as indicated by present soil use maps—for farming activities.

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The selection of Campanian rural landscapes in the present catalogue can be regarded as stages in an itinerary. This is best begun with the landscape boasting the longest history, namely, that of *vite maritata* ("married vine") in the plain of Aversa, where the grapevine grows on black volcanic soil dating back to the Neolithic. The same soil, surprisingly, has come to light in excavations for Naples' new subway, right in the middle of the city's historical center; it bears perfectly preserved 4,500-year-old plough marks. According to Sereni's account, later on a close-knit mesh of *arbustum galicum* extended onto these soils. *Arbustum galicum* is a "marriage" of grapevine and poplar, a system dating back to the Etruscans. The vineyards are laid out following the centuriation grid, which in the Aversa and Caserta countryside still appears to be essentially intact in 1950s Military Geographical Institute maps. The *vite maritata* landscape is depicted with photographic accuracy in paintings by Lusieri and Hackert, and described in very similar terms over a time range of a century and a half by Goethe, Galanti and Sestini. Today only residual patches survive, scattered in the chaotic urban sprawl of the Caserta-Naples conurbation, in areas that have become notorious as dumping sites for an illegal waste disposal trade managed by criminal clans.

Going up from the plain to the slopes of the Phlegraean volcanic rises, the *vite maritata* landscape is followed by that of elaborately structured orchard gardens (*orti arborati*), a local derivation of Sereni's *giardino mediterraneo*. Here the cultivation units are fragmented in a disorderly, luxuriant mosaic, extending onto broad terraces called *ciglioni*. The agro-ecosystem is organized vertically on three or four altitude levels, with vegetable gardens at the bottom level; grapevines and drupaceous trees on the middle one; and walnut and cherry groves at the summit, resembling, according to Galanti ". . . una immensa foresta," and which Sestini says are almost comparable to woods (". . . quasi a dei boschi").

Phlegraean vegetable gardens with trees are still found in the city of Naples, where they are now placed under public protection in the Metropolitan Park of the Hills of Naples, instituted by the Campania Region in 2004 in enactment of Naples' farsighted urban development plan.

Also within the coastal strip of the region, important variants of the terraced orchard landscape have formed through processes of specialization that took hold from the mid nineteenth century onward, leading to the flourishing of very prized strains of apricot on the northern terraces of Mount Somma, and of lemon on the "heroic" terraces of the Amalfi coast.

Moving eastward from the Campanian plain towards the calcareous hills surrounding it, the transition to more temperate environments is marked by an increasing presence of hazelnut landscapes. Hazelnut has been grown in Irpinia ever since antiquity, either as a single crop or in association with walnut or cherry, forming an almost continuous cover on the deep pyroclastic soils of hollows and foothills.

The landscape becomes fragmented and complex again when one reaches the inland hills. Here, however, structural complexity within the same cultivation unit is no longer vertical, as in the orchards of the coastal strip; in the low Irpinian and Samnite hills, landscape diversity is informed by horizontal variability. Here elaborate mosaics of vineyards, olive orchards, arables, and oak and chestnut groves form a close-knit fabric dominated by small medieval fortified burgs.

Moving from the hills to the calcareous rises of the Apennines, our catalogue entry on reforested areas in the Sele basin focuses on a valuable forest and pasture landscape that was the result of large scale mountain reforestation carried out by the government in the first decade of the 1900s to protect the sources of the Sele, in enactment of the 1902 law for the Puglian aqueduct. Over a century this landscape has evolved. The settling in of autochthonous forest species alongside the conifers has resulted in a very harmonious mosaic of woodland and pastures; a situation that elicits the intriguing question whether in managing these ecosystems one should second the natural proliferation of indigenous vegetation or strive to preserve the historical character of the twentieth-century planted forest.

Concerns about the future of the historical rural landscape heritage of Campania are well founded. Still, the regional government's newly adopted land management legislation gives some reason to hope. Notably, the Guidelines for the Campanian Landscape—laid down in Regional Law 13/2008 as part of the Regional Land Plan—include accurate maps of the region's rural landscapes and cogent prescriptions for their conservation and management. The preservation of its extraordinary landscape heritage can afford this ravaged region an opportunity for civil redemption and enduring development; but this depends on the will and ability of the region's government, businesses, and individual citizens to make the strategy set down in this new legislation their own and concretize it in continued and consistent action.

20.2 Historical Terraced Orchards on Mount Somma (40° 50′ 55.33″ N; 14° 26′ 28.70″ E)

The area is remarkable for its traditional apricot cultivation on "heroic" terraces on the slopes of Mount Somma. It extends over a surface of 500 ha, mainly privately owned, at Santa Maria delle Grazie a Castello, in the National Park of Vesuvius and the Monte Somma SCI, within the municipality of Somma Vesuviana. It can be reached from Naples by taking SP 330, direction "Paesi vesuviani". After reaching Somma, one drives further on Via Pomigliano and then takes the turn to Santa Maria delle Grazie a Castello. The area extends over the fairly steep slopes of Mount Somma, which have a regular profile and are scored by deep grooves, with very deep soil, over ash and lapilli fallout up to 600–700 m a.s.l. This is the northern and most ancient portion of the Somma-Vesuvius complex. It retains the morphological characteristics of the older volcano before the Plinian eruption of 79 A.D., which completely devastated the southern and coastal versants of the Somma. The Somma landscape, with its cool and humid microclimate, embodies the verdant and peaceful aspect of the volcano.

The area owes its significance to its traditional farming methods, employing terracing systems with high agronomic, environmental and landscape value. At higher altitudes, the orchards border on chestnut coppice woods and mesophilic mixed woods with interesting relic groves of beech. The apricot orchards grow along the lower contour lines. According to some scholars, Pliny the Elder, who died at Castellammare di Stabia in the 79 A.D. eruption of Vesuvius, refers to apricot trees on the

Fig. 20.1 The historical contour terraces of Monte Somma, on the northern slope of the Somma-Vesuvio volcanic area

slopes of Vesuvius. The first certain testimony of the species' successful cultivation in the area, however, dates back to the 1500s. It is a clear agronomic description by the Neapolitan scientist Gian Battista Della Porta in his 1583 work *Suae Villae Pomarium*. Della Porta divides apricots in two groups: *bericocche*, round and with a white meat, and the more prized *chrisomele* (a Greek word meaning "golden apples"), with a sweet fragrance and good taste. Indeed, in Neapolitan dialect a word for apricot is *crisommola.* The typical local variety of apricot is the *Pellecchiella* (Protected Geographical Indication), a late-maturing, vigorous and very productive tree of autochthonous origin. These are valuable apricots, much appreciated not just by the local market but also by large wholesale dealers, and the demand for them is growing. To facilitate agricultural production in a landscape where transportation is difficult, the Park allows the building of monorails.

Overall, the area appears intact, with individual farm buildings and scattered settlements, but a generally low urban density. The terrace structure is still well

defined along the slopes, although many of the terraces have been abandoned and are now covered with woods. At higher altitudes the cultivated terraces appear as isolated patches in the woods, while others extend over larger expanses along the northern slopes of the volcano. The rural paths are poorly maintained. There is also an issue with the protection of crops from hail, currently ensured by anti-hail mesh on chestnut-pole pergolas, a system that has a strong visual impact. To solve this problem the Park has signed a protocol of agreement with local professional associations to promote the devising of more landscape-compatible protective solutions.

As to its vulnerability, the area, like all agricultural land in the Park of Vesuvius, is presently affected by contrasting dynamics of change. Farming is being abandoned on the higher slopes, in spite of their suitability for the growing of high-quality cultivars, while both farming and urbanization tend to intensify on the lower slopes and at the foot of the mountain. In this situation, the production of the prized *Pellecchiella* appears to be the only economic driving force that can ensure the vitality of the rural landscape and the costly maintenance of the historical terraces. Careful government monitoring of building and infrastructural development is the priority, instead, in the plain at the foot of the mountain. The Park of Vesuvius should not become an island in a sea of low quality urban sprawl exposed to absolutely unacceptable levels of environmental (volcanic and hydrogeological) risk (Fig. 20.1).

20.3 Mixed Hill Cultures of Lower Irpinia (41° 00′ 32.09″ N; 14° 56′ 40.61″ E)

This is a hilly mosaic landscape characterized by multiple soil uses located in the eastern part of the commune of Montemiletto in the province of Avellino. It extends over about 300 ha. The area is located in the municipalities of Montemiletto, Taurasi, Torre le Nocelle, Lapio. Access is from Avellino by SS 7 to Montemiletto and on through Contrada Festola to the east side of Contrada Sant'Antonio. Geologically the area is constituted of marl-sandstone, marl-limestone, and conglomerates, with at altitudes between 250 and 950 m a.s.l. The morphology is one of gentle hills with summit plateaus delimited by river-cut valleys. The soils are deep and middle or moderately fine grained. They are evolved from marl mixed with volcanic fallout (ash and pumice). The pyroclastic deposits are still quite thick along the gentle summit slopes, which are typically used for wine-growing.

The area owes its significance to the historical persistence of the typical landscapes of the Irpinian hills, which are characterized by a mosaic of different land uses: arables, orchard and vineyard gardens, olive orchards, and woods. The area has been frequented ever since remote times, as the discovery of vestiges of prehistoric settlements bears out. Agricultural colonization began sometime in the second century B.C. The fortified burg of Taurasi, instead, was founded by the Lombards in the sixth century A.D. In this period the district was organized according to the *curtis* principle, which became consolidated under the Norman domination, after 1000 A.D. Eventually the population started to concentrate in fortified burgs, abandoning

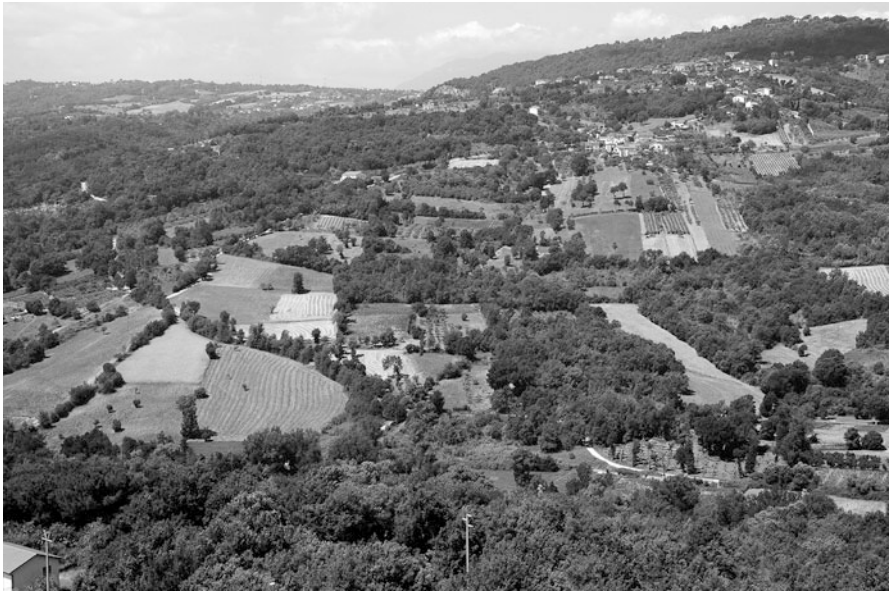

Fig. 20.2 Lower Irpinia has a landscape characterized by small-scale traditional polycultures

the scattered settlements they had lived in previously. The land was subdivided into small parcels around the burg. The growing of *aglianico* grapes, from which Taurasi wine is produced, is mentioned by Titus Livy in the first century B.C. Monumental cellars dug into the native tuff bear witness to the antiquity of wine growing in the area. The history of farming in the lower hills of Irpinia was characterized by a variable but usually balanced ratio between bare or treed arables and specialized orchards (vineyards, olives, hazelnut), a consequence of the fragmentation of land ownership. In the immediate surroundings of settlements, which typically developed around the small Medieval walled burgs, a complex parcel system prevails. The local landscape indicates a historical persistence of the typical tree-planting patterns of mixed cultivation that characterized much of Italian agriculture, as opposed to the bare latifundium. On the other hand, these very same patterns bear witness to the progress of farming techniques in the area, although within the framework of traditional agriculture. The area shows the same structural characteristics in portions with non-specialized sparsely laid-out olive orchards and patches of woodland alternating with cultivated fields. Often oak and deciduous broad-leaf woods grow on hilltops, on lithic rises, and on the steeper slopes of river-cut valleys.

As regards the integrity of this landscape, its agriculture is still quite vital, and its traditional organization and balances have not been completely upset by the urban transformation, as is more frequently the case in the plain. The result is a harmonious and varied landscape, a close-knit mesh of plots bordered with rows of trees and hedges. The main changes are due to the expansion and modification of the settlement pattern, which was originally based mainly on clusters on summits and crests. After

the 1980s earthquake a strong trend to dispersion set in, with ribbon-shaped patches of housing radiating out from the main roads and a significant increase of scattered houses. In some areas dense groves of trees have colonized fields.

As regards vulnerability, the main concerns are for the wine-growing sector, which undoubtedly drives the local economy. This is the production area of the DOCG (Controlled and Guaranteed Origin Denomination) "Taurasi" wine, which today has gained international renown. Growth of demand could lead to excessive intensification threatening to undermine the traditional landscape mosaic. Indeed, the local communities have proved capable of meeting the strong demand of the regional economic sector as a whole, but they are doing so by setting up technological, industrial, and energy systems whose environmental compatibility is highly questionable, and that are at odds with the high quality of the area's landscape and choice agricultural products (Fig. 20.2).

20.4 Terraced Lemon Orchards of the Amalfi Coast (40° 38′ 42.27″ N; 14° 39′ 14.17″ E)

The area is remarkable for its citrus orchards on historical terracing along the Amalfi Coast (the southern versant of the Sorrentine peninsula framing the Bay of Salerno to the north). It extends over a surface of about 400 ha, mainly privately owned, in the municipality of Minori, province of Salerno. The area is partially included in two SCI ("Costiera Amalfitana between Maiori and the Bonea torrent" SCI, and "Valloni Amalfitani" SCI). Access is from the Tramonti road, following state road SS 163, which goes from Amalfi through Maiori and Minori. The craggy morphology enhances the scenic beauty of the landscape: a coastline cadenced by sheer limestone and dolomitic promontories plunging into the sea like a succession of theater wings. The soil originated from ash and pumice-stone fallout. The terraces generally lie at altitudes between 0 and 300 m a.s.l.

The landscape owes its significance not just to its extraordinary beauty, but also to the historical importance of these extensive terracing systems, which have a high productive, environmental, historical, and aesthetic-perceptual value. This imposing work of environmental engineering took eight centuries, from the ducal period (twelfth century) to the early twentieth century. According to the local historian Don Giuseppe Imperato, in nearby Ravello the first seeming reference to a terraced cultivation dates back to 1012, when the Ravellans built small terraces with dry-stone walls they called *macerinae*. The scarcity of cultivable land, which had to be wrested from the rock by means of ingenuous tilling and terracing, always required intensive exploitation of the soil. Hence the prevalence of citrus orchards and "vineyards with fruit", with grapevines originally trained onto live supports—almond or walnut trees—later onto long poles, and finally on chestnut-pole pergolas. Thus one avoided monoculture, allowing vegetables to be grown at the foot of the trees or poles. Peasant families were thus almost totally self-sufficient for food. The wine itself was actually a surplus, which could be sold to acquire other foodstuffs to supplement the

Fig. 20.3 The terraced citrus orchards of the Amalfi coast are one of the best known and spectacular agrarian landscapes of the Campania region

family's diet. On the terraced slopes today farmers grow the "Sfusato di Amalfi", a prized lemon cultivar whose fruit is both consumed fresh and used to make sorbets and liquor ("limoncello"). The Sfusato, which is a Protected Geographical Indication product and is included in the "Ark of Taste" list by Slow Food, is grown both in single-crop orchards and in association with vegetables and grapevine. The orchards are protected with traditional screens called *pagliarelle* or *incannucciate*. These are straw mats that shade the orchards during the summer and thus slow down maturation, allowing late harvests. They also protect the orchards from the wind and salt deposits, control evapo-transpiration, and preserve the humidity of the soil.

Within the area terrace farming still appear to be sufficiently preserved, although some abandoned terraces are being invaded by vegetation and urban expansion has encroached on what used to be a mainly rural landscape. As is often the case, while such protected areas can be afforded a certain degree of protection from urban expansion, it is much harder to control processes of spontaneous forestation, such as are already under way in the terraced vineyards of Cinque Terre. Thus, this landscape's vulnerability mainly depends on the state of agriculture along the Amalfi Coast, which is still declining, as increasing abandonment of cultivations bears out. The reasons are structural and all ultimately stem from insufficient yields depending on the high costs of traditional management systems and terrace maintenance (for which it is now hard to find qualified workers); fragmentation of farmland ownership; still inadequate commercialization; and the ageing of the farming population due to the absence of a significant generational turnover. This process is impacting

both farmland and woods, and increasingly threatening the survival of cultivation systems, historical terracing systems, and the overall hydrogeological balance. The social cost of the decline of the landscape of the Amalfi Coast is very high, and this decline also threatens to impact the local flourishing extra-agricultural economic activities, notably tourism and seaside resort management. People involved in these sectors still fail to realize that the rural landscape is the only true base resource for the area's economy, and that the costs of a serious landscape policy supporting historical terrace agriculture are the best possible investment for the security and prosperity of this world-renowned area (Fig. 20.3).

20.5 Terraced Hazelnut Groves of the Vallo di Lauro and the Baiano Area (40° 55′ 14.01″ N; 14° 37′ 40.92″ E)

This terraced hazelnut grove landscape extends over about 650 ha, mainly privately owned. The area lies within the municipality of Baiano (province of Avellino), which partially falls within two SCI (Pierta Maula and Monti di Lauro). Access is from the A3 highway, exit Baiano. One takes Via Calabricita, passes under the highway, and proceeds south to the hills to the right of the highway. The area is representative of the hazelnut landscapes of the terraced Pre-Apenninic foothills of the Vallo di Lauro, the Baiano area, the limestone rises of Montevergine, and the Sarno mountains, characterized by deep pyroclastic soils covering a carbonaceous substratum.

The area owes its significance to its long tradition of hazelnut growing, which indicates that Campania may have been the earliest coryliculture area in Italy. Cato, Columella, Pliny, Palladius and Virgil mention extensive growing of hazelnut, sometimes as a single crop. Medieval notarial documents contain terms such as *avellanieta*, *abellanieta* and *nocilleta*. A contract drawn up by the lord of the castle of Monteforte in August 1200 mentions a plot "with hazelnuts" in the territory of Serretella. Depictions of hazelnut trees are also commonly found in bas reliefs from the Roman Period, in frescoes such as one from the House of the Deer in Herculaneum, and in Medieval paintings. Until the mid twentieth century, the area limited to the north by the Avella-Partenio massif and to the south by the mountains of Lauro and Nola was characterized by a crop sequence with arables (wheat, maize, hay) along valley bottoms; a mosaic of olive orchards, vineyards, and hazelnut groves in the foothills; and thick coppice woods and chestnut groves on the upper slopes and summits. In the second half of the twentieth century this organization was modified by specialization. Hazelnut culture was extended to the valley bottoms and foothills, as a single crop or in association with walnut and cherry. The hazelnut is a typical product of a millenary tradition and a strategic resource for Irpinian agriculture and economy, as even its botanical name bears out: *Corylus avellana*, from the ancient city of Abella.

As regards integrity, the area appears quite homogeneous and well-preserved, with a very vital landscape where the terraced hazelnut groves are still clearly recognizable and have retained their function. It lies within a vaster coppice wood district with few rural structures and a sparse road system, mainly constituted of forest trails.

Fig. 20.4 The Campania region is the earliest area in Italy for hazelnut cultivation, which is mentioned as early as the Roman period

As regards vulnerability, the area's environment is principally threatened by the impact of production techniques on soil preservation. Weed control in hazelnut groves is traditionally carried out by repeated surface raking that exposes the soft pyroclastic soils covering the calcareous substratum to the erosive action of water runoff, resulting in high soil loss rates. It is worth remembering that the volcanic soils shrouding Campania's calcareous rises are not renewable, since soil losses by erosion cannot be compensated by the alteration of the carbonaceous substratum. The thinning of soils in these environment is thus an irreversible phenomenon that results in a permanent decrease of ecological productivity. Another vulnerability is the high proneness of such agro ecosystems to mass erosion in the form of fast flows of pyroclastic mud triggered—as in the case of the Sarno landslides of 1998—at natural or artificial cuts or discontinuities in the pedological cover. This risk is aggravated by insufficient road and forest maintenance, as well as the progressive abandonment of coppice woods on upper slopes. These peculiar vulnerabilities make hazelnut landscapes a paradigmatic example of the problematic nature of the agro forestal systems of the Campanian Apennines, which are characterized by very high productivity, but a very low long-term resiliency. In these environments, the priorities of land management policies should be support to agriculture, the spread of rational management systems, and a foresighted investment in maintenance, also to the purpose of preventing the environmental disasters that threaten the populous towns and the physical and infrastructural capital of the region's foothills (Fig. 20.4).

20.6 Terraced Orchard-Gardens on the Hills of Naples (40°53′22″ N; 14°12′39″ E)

This area provides a typical example of a landscape with elaborately structured terraced orchard-gardens in the Phlegraean volcanic hills. The area is mainly privately owned and lies within the district of Chiaiano in the commune of Naples. It extends overabout 200 ha within the Metropolitan Park of the Naples Hills, which encompasses a total surface of 2,215 ha within the city limits. Access is from the Naples hospital district, by Via Toscanella going towards Chiaiano. The morphology of the area is characterized by an elaborate system of coastal hills divided by hollows and calderas, connected to the north with the Campanian plain through the gently sloping outer versant of the Phlegraean Archicaldera, an immense volcano destroyed by the catastrophic Campanian Gray Tuff eruption of 30,000 years ago. The geological substratum is constituted of rhyolites and pyroclastites.

The area owes its significance to the historical persistence of treed terraces. These date back to the beginning of the Angevine period (thirteenth century), but are first depicted in the Strozzi board of 1470, an oil painting in the San Martino Museum that shows a view of the city from the sea. The terraced vineyards of the Carthusian monastery of San Martino, with their exquisite tuff walls reinforced with arches, date from the mid fourteenth century. Wine growing is documented continuously here down to the present day. By the late eighteenth century, arboriculture had become a significant landscape element on the hills looking out towards the Bay of Naples. The Naples Hills Park today houses about 400 ha of terraces that form the heart of this landscape. Within the selected area, around the Chiaiano Farmhouse, one can admire very old cherry groves producing a prized local variety of cherry, large and with a crisp meat, called "Recca", recognizes as a Traditional Agroalimentary Products by the Ministry for Agricultural, Alimentary and Forest Politics. In the hollows and on the outer versant of the Archicaldera one finds the single-crop orchards and elaborately structured orchard-gardens of historical farmhouses. The area also encompasses significant portions (overall ca. 250 ha) of the chestnut coppice woods of the Selva di Chiaiano, which are part of one of the largest urban woodlands in Italy, 500 ha in the heart of the city. These chestnut woods, attested as early as the eighteenth century, were exploited in several ways. In the first decades of the twentieth century they employed more than 3,000 people. In some points the woods extend to the historical center of Naples, forming green corridors that connect the city to the Hill Park.

As regards its integrity, the area is still remarkably well preserved, although as an enclave within a highly urbanized zone. Over the last fifty years, this rural landscape has been impacted by intensive and chaotic building, which today has covered almost 50 % of its surface and broken its continuity. Along the southern limits of the area are many yellow-tuff quarries, now abandoned. With their vertical walls, rising as high as 80 m, they have the appearance of majestic amphitheaters. The rest of the Park area is disseminated with historical farmhouses built between the 1600s and the 1800s. In the non-urbanized areas one can still observe a complex agro-forestal mosaic with arboreal patches on the northern slopes (chestnut coppice woods and mixed mesophytic woods) and on the craggier southern and coastal slopes (downy

Fig. 20.5 The terraced orchard gardens on the hills of Naples date back to the Angevine period (thirteenth century). Nowadays they are threatened by urban sprawl

oak and holm oak, brush, and xerophilous meadows), alternating with farmland with orchard-gardens and vineyard-gardens on extensive series of broad terraces.

As regards its vulnerability, the fact that such a complex rural landscape lies in the heart of the vast Neapolitan metropolitan area obviously exposes it to a broad range of threats, such as the impact of extra-agricultural activities on farming and woodland ecosystems; unauthorized building; and the clandestine waste disposal cycle. A major waste dump is presently being established in one of the abandoned quarries along the western limit of the area under examination. On the other hand, the multi-functional propensity of the area's agricultural and forest spaces offers the possibility to support rural development by conveying the diverse flux of environmental goods and services produced in the area to a vast public of citizens, trying to overcome the structural gaps that farms are usually weighed down with. The mission of the Hill Park is to support the many potentialities and functions of urban agriculture and undertake radical prevention, monitoring, and remedial action to the purpose of containing the multiple degenerative dynamics affecting the local landscape (Fig. 20.5).

20.7 Historical Afforestations in the Sele Basin (40° 49′ 12″ N; 15° 07′ 53″ E)

The area under examination here is one where extensive afforestation and hydraulic works were carried out to protect the sources of the river Sele as part of the Puglian aqueduct project. It extends over about 2,000 ha, mainly publicly owned, in the

municipalities of Bagnoli Irpino, Nusco, Lioni and Caposele, in the province of Avellino and within the Regional Park of the Picentini Mountains. Access is from the town of Bagnoli Irpino. From here one drives towards the Laceno Lake, where several forest roads lead to the north-north-east into the center of the area, in the direction of Nusco, Lioni and Caposele. Geologically, the area is constituted of large carbonaceous massifs of the Campanian-Lucanian platform, holding large aquifers. These massifs are made up of dolomitic stone underneath and Mesozoic limestone at the top (upper Triassic-inferior Cretaceous). Limestone and dolomitic limestone alternate in more or less compact banks and layers with ample rainfall-engendered karstification. The area's morphology is characterized by rounded rises divided by narrow valleys and small tectonic karstic hollows, which over time have filled up with incoherent material, residual karstic material, and eluvium. Volcanism also played an important role, even in recent times, in shaping the area by depositing a cover of pyroclastic material that has attenuated the steepness of the harsher slopes and partially filled up depressions.

The area owes its significance to a silvopastoral landscape characterized by afforestation and hydraulic works carried out from 1903 to 1910 as part of the construction of the Puglian Aqueduct, a project that is highly representative of the State's action to improve southern agriculture. These works were carried out in the broader framework of policies enacted to improve the Italian mountains ever since the foundation of the unitary state and until the establishment of the Italian regions in the 1970s. These policies included the afforestation of about a million hectares over the whole country. Thousands of jobs were created, especially in the south to establish and maintain these new woods. The technical objective was to ensure versant stability by recreating the forest cover. This action, however, gave rise to a controversial "state landscape" that contrasted with the "social landscape" of the mountains, which was sparsely wooded to allow grazing and agriculture. The purpose of the works carried out in the Sele basin was to increase the scarce forest cover to ensure the renewal of the water resources required to feed the Puglian Aqueduct, and also to limit the recurrent landslides and floods that plagued the area, as prescribed by the law for the creation of the Acquedotto Pugliese approved by both branches of Parliament on 26 June 1902. In the eight following years, 515 ha were reforested and dozens of small stone dams were built to regulate torrents. Ample stepped terraces were also built to receive the seedlings. The planted species were mostly conifers, especially black pine (*Pinus nigra*, *var. Austriaca* and *Pinus laricio Poiret, var. Calabrica*) and Neapolitan alder (*Alnus cordata Loisel.*), introduced in a pre-existing silvo-pastoral landscape dominated, instead, by beech, Turkish oak, black hophornbeam, and extensive pastures. To produce the hundreds of thousands of seedlings required, a nursery was established in the locality of Tronola. A century later, the afforestation has integrated into the landscape, losing the rigidity of its original layout. Today the reforested zones alternate with open areas and native woods, and are thus a good example of the integration of newly planted conifer—a species whose landscape qualities have often been criticized—into a historical pastoral landscape.

Fig. 20.6 The afforestations and watershed management systems in the Sele basin are historical testimonies of the construction of the Sele aqueduct by the Italian state

Today the landscape still appears essentially unaltered since 1910. Stretches of reforested woodland are still present, as well as stone retaining walls along the channels of the principal torrents, especially in the Brecce (or Tredogge) valley, which is the highest altitude branch of the Sele river basin. These walls have undergone maintenance a number of times. The original reforested woods—although their extension was reduced by grazing as well as the death of many of the newly planted trees—are still visible. They are interspersed with beech and alder groves. Grazing and forest fires have always been the principal enemies of afforestation. This forest was protected first by the personnel of the Royal Forest Corps, and subsequently, during the Fascist period, by the National Forest Militia. There were many conflicts with the local mountain people over grazing limitations in recently planted woods.

The area mainly owes its vulnerability to natural evolution. Autochthonous species are replacing the newly planted ones and taking over open spaces, a process also favored by the gradual abandonment of grazing. Thus, the preservation of the uniqueness and historical value of the local landscape depends on the delicate balance between the landscape constructed at the beginning of the twentieth century and the pre-existing one. The Picentini Mountains Park can play an important role in preserving the area's historical value, also by supporting economic activities emphasizing the connection between the typical local pastoral products and the landscape (Fig. 20.6).

20.8 Vite Maritata of the Phlegraean Volcanic Plain (40° 58′ 36.67″ N; 14° 06′ 53.48″ E)

The *vite maritata* ("married vine") landscape extends over a surface of about 900 ha within the municipality of Giugliano in Campania (NA). It can be reached from Giugliano by taking SP 18–2 to the locality of Quadrelle Ischitella. The area is mostly privately owned. It shares the features of other volcanic plains in the region. Vast gently sloping surfaces connect the versants of the volcanoes and calcareous rises of the Pre-Apennines to the alluvial plains of the Regi Lagni and the Volturno. The volcanic soil is dark, deep, permeable, and easy to till. The area is partitioned by the orthogonal grid of centuriation, which in vast sectors of the plain still branches out from historical centers, determining the layout of fields, roads and settlements.

This landscape mainly owes its significance to its high stands of *vite maritata*, tree married to the vine. According to Sereni, they are direct descendants of the Etruscan *arbustum galicum*. Manarese defines them as the Campanian *arbustato*. This is one of the two main systems employed in European wine-growing at least since the second postwar period as an alternative to the low shrub-like grapevine of Magna Graecia. The prosperity and productivity of these vineyards is mentioned by classical Latin authors such as Pliny, Varro and Columella. The *vite maritata* system consists of vines raised high up and eventually bound to poplars. The grapevine thus takes on a typical wreath shape at the top of the high poplar. Sprays shoot out southward to limit shading to underlying crops. The result is a unique agricultural landscape. In the volcanic plain, grapevine grows to exceptional sizes. Some specimens have trunks 20–30 cm in diameter with roots plunging down into the deep vertical sequence of volcanic soils. The result is thus a continuous sequence of adjoining orchards, often hemmed in by hedges or bordered by paths, and arable fields delimited by rows of high and slender poplars or walnut trees, between which grapevine sprays stretch out like spider webs. These rows of trees cadence the landscape, regulating the shape of plots and the forms of land management, and paths in fields often run alongside them as well. These vineyards produce high quality wines: "Aversa Asprinio DOC (Controlled Origin Denomination)" and "Aversa Asprinio Alberata DOC".

The integrity of this landscape has been compromised by its incorporation in the chaotic conurbation that extends today between Caserta and Naples. Indeed, the transformations of the Phlegraean plain over the last forty years do not depend merely on processes within the agricultural sector—the gradual specialization of traditional cultivation systems—but also on the impetuous development of urban, productive and infrastructural systems, and the consequent intense competition in soil exploitation. The effect of this model of uncontrolled urban expansion is the irreversible depletion of soils and the fragmentation of the rural space. Within four decades there has been a transition from a mainly rural organization, with a centralized settlement and infrastructural pattern dating back to the eighteenth and nineteenth centuries immersed in a highly continuous rural landscape, to a mainly urban organization where agriculture is relegated to the fringes. The rural space is thus broken up into increasingly unconnected patches that are highly exposed to degradation and the

Fig. 20.7 The growing of vines trained on poplar is a distinctive feature of the Phlegraean landscape, also mentioned by Pliny the Elder. Along with the bush-vine system, typical of the areas colonized by the Greeks, it is one of the original features of the Italian agrarian landscape described by Emilio Sereni

interference and pressure of adjacent urban and industrial activities. In this context, agricultural production has also evolved significantly. Traditional multi-cropping has diminished and there has been a spread of irrigated fields and single-crop and protected vegetable gardens.

As regards vulnerability, we must first of all observe that the *vite maritata* cultivation system is struggling to survive, partially due to the gradual disappearance of traditional knowledge of its specific cultivation techniques. The vineyards are also threatened by uncontrolled urbanization, which is constantly eroding high-fertility volcanic and alluvial soils. Furthermore, the area is plagued with notorious and serious law-enforcement problems as regards economic and land transformation activities, such as unauthorized building and illegal waste management. Urban expansion and intensive agriculture have led to the degradation and trivialization of the traditional landscape in vast tracts of the plain. They have also further altered an already precarious water balance by polluting ground and superficial waters. Notably, the Phlegraean plain is bordered to the northeast, near Acerra, by the alluvial plain of the Regi Lagni canal, which since a couple of years ago has become notorious for clandestine dumping of toxic waste (Fig. 20.7).

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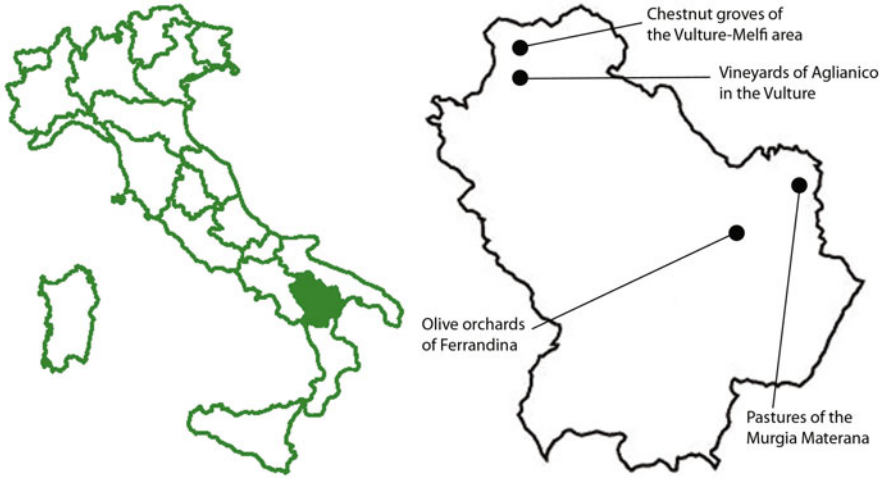
Chapter 21
Basilicata

Saverio Russo



21.1 Introduction

A very ancient land, Basilicata was inhabited as early as the Paleolithic and the Neolithic, when the first organized farming villages sprang up in the Matera and Melfi areas. In the eighth century B.C., the first Greek colonists landed on the Lucanian shores of the Ionic Sea, giving rise to the flourishing civilization that went down in history as "Magna Graecia". It is to the Greeks that we owe the first systematic agricultural landscaping of the Italian South. The region, known as Lucania even

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before the Romans, later took the name of Basilicata, except for a short period, from 1932 to 1947, when it officially resumed its ancient name. Its inhabitants, instead, have always been known as Lucani. Basilicata is mainly mountainous and almost totally lacks plains, except in the Metaponoto area. Its harsh and craggy morphology has always influenced the character of Lucanian agriculture, as well as that of its society and economy. 35 % of the region's area is covered with woods. The utilized agricultural surface extends over little more than half of the total surface, and consists for 27.5 % of pastures and 72 % of farmland. Although the area with the best potential morphological and bioclimatic conditions for farming is that of Metaponto, it only became available for agriculture after major reclaiming works were completed in the first half of the twentieth century. Hence, Lucanian agricultural landscapes having a "historical character" are concentrated in the hills, where ever since the time of Magna Graecia the crops that epitomize "Mediterraneity" appeared; notably the olive tree (the steno-Mediterranean species par excellence) and the sub-Mediterranean grapevine. The Metaponto area is presently one of the most important fruit and vegetable districts in all of Italy. Although here citrus growing mainly began to spread in the last century, a few kilometers from the plain, on the gentle clayish slopes between Tursi and Montalbano Jonico, the "Staccia" orange has been grown since ancient times, foreshadowing what was to transpire many years later down in the reclaimed lands in the plain. A poorer agriculture, instead, has been traditionally practiced in the mountains. Wheat, as well as typical and niche vegetables, have always been the typical crops of the marginal agriculture of the plateaus and small valleys of the many Lucanian massifs. The cultivation of wheat deserves separate consideration. It has always been grown in Lucania. By 1975 it already accounted for over 30 % of the Useful Agricultural Surface (UAS), and has been expanding constantly over the last few decades. The cost of this expansion has mainly been paid by the meso-xerophilous woods of hill and low mountain slopes, whose best preserved testimony is presently found in the pastureland of the Matera side of the Puglian Avampaese. The northeast area of Basilicata, instead, ever since the abolition of the Dogana della Mena delle Pecore has become the best example of the expansion of non-irrigated farmland. As part of this process, the tillage of the soil of Monteserico at Genzano, with its 17,000 ha of woods, bush and pastures (some of the best in the Dogana di Foggia), on the one hand, and the deforestation of the nearby Bosco della Badia near Banzi, regarded at the time as one of the most extensive Lucanian forests, were among the most emblematic episodes in the transformation of the Lucanian agrarian landscape in the second half of the nineteenth century. Returning to deforestation, this is undoubtedly a phenomenon that affected the whole Western world in a rather recent past, although in different ways and at different times. At any rate, the expansion of woods registered in Italy in the last century also regarded Lucania. Today the region has dense and extensive woods that are being exploited in multiple ways. The historical relevance of the Vulture chestnut groves and their importance for the mountain populations is stressed in the entry devoted to them in the present catalogue. The thick woods of this area gave shelter to brigands who infested the whole region in the second half of the nineteenth century, a phenomenon depending on the extreme indigence of the local population. As in the rest of southern

Italy, there was very high emigration here in the early 1900s. It is worth mentioning that the spread of the Turkish oak (*Quercus cerris*) mainly depended on the use of its especially hard and durable wood to make sleepers for Italy's "historical" railways. Trees of this species form some of the most beautiful groves in the stretch of the Apennines extending from the Sella di Conza to the Passo dello Scalone, such as the *cerreta* of Monte Croccia near Accettura, the Cupolicchio Woods at Tricarico, etc. The areas we have selected do not bear witness to every aspect of the Lucanian district, but reflect an attempt to highlight an added value found in some significant rural districts; notably, the extraordinary connection between history, traditions, and landscape in districts where cultivations have become the distinctive element of the landscape. Here farming permeates local culture and phenological cycles are synchronous with the life rhythms of local people.

21.2 Chestnut Groves of the Vulture-Melfi Area (40° 58′ 51″ N; 15° 39′ 10 E)

The area is covered with chestnut orchards extending over upper hill and lower mountain slopes for about 2,100 ha. The landscape is protected according to the landscape law n. 1497 of 1939 and n. 431 of 1985. The land is mainly privately owned and lies within the townships of Atella, Barile, Melfi, Rapolla, and Rionero in Vulture, except for some publicly owned areas mainly at Rionero in Vulture. The area can be reached from the Bari-Napoli highway. One exits at the Candela tolls and takes the SS 658 in direction Potenza. After exiting at Melfi one drives on towards the Lakes of Monticchio. This chestnut grove area, the most important in all of Basilicata, lies in a district encompassed within a half circle formed by the eastern slopes of the Vulture. The versants here are usually not especially steep and altitudes range from 500 to 1,000 m a.s.l. The soils of volcanic origin of the slopes of the ancient Vulture volcano are ideal for the acidophilic nature of the species *Castanea sativa.*

The local chestnut orchards are a highly significant landscape element of the Vulture area, especially for the Melfi farmland. They are an emblematic illustration of the expression "chestnut civilization," used to describe the historical importance of this type of woods in Italy, where the chestnut tree is also known as the "bread tree" for the fundamental importance of its fruit in human diet. In the Vulture area, besides having great aesthetic landscape value, chestnut orchards play an important role as an element of local historical identity. As early as 1231, the Costituzioni di Melfi included clauses to protect chestnut orchards—which at the time were mainly grown as a source of food—from damage caused by cattle. The Costituzioni, issued under the reign of Frederick II, is the first general code of law for the whole kingdom of Sicily. It was a milestone in the history of law and bears witness to the importance of chestnut growing in all the kingdom. The significance of the chestnut tree and its fruit for the area is borne out by the prominence of the *varola*—a local term for the roasted Melfi chestnut—in the important oenogastronomic event "Aglianica" and, above all,

Fig. 21.1 The removal of the undergrowth is one of the typical features of chestnut orchards, which were managed as carefully as gardens

in the homonymous "Festival of the Varola" held annually at the end of October in the center of Melfi. The strong identity value of the crop for the Vulture-Melfi geographical area is borne out by the area's recent request for a PGI-brand for the local chestnuts. The rural landscape of the area is enhanced by the presence of many rock churches, such as S. Margherita dello Spirito Santo and Santa Lucia dei Giaconelli. Others are still waiting to be discovered. These churches provide a link between the rhythms of rural life and popular religion, confirming the importance of Lucania as one of the Italian regions where testimonies of ascetic life are most abundant. From a structural point of view, the most organic is the church of Santa Margherita, entirely dug into tuff rock. It dates back to 1200 and all its walls are frescoed.

The area shows a good degree of integrity as far as the chestnut orchards are concerned, especially in the parts where regular maintenance is performed. This is partially a consequence of the importance attributed to the chestnut and of the gastronomic events held to support its production. Special attention should be devoted to monumental chestnut trees. These should be identified and preserved even if they are no longer productive or in poor condition.

The area's main elements of vulnerability are the gradual decline of farming and the risk of attacks by parasites. Mount Vulture is included in the Rete Natura 2000 (Nature 2000 Network) as a Site of Community Interest and a Special Protection Zone for plant and animal species. This naturalistic destination will probably be confirmed at the institutional level by the soon to be established Regional Natural Park of Vulture. This approach threatens to encourage a gradual evolution towards

mixed woods leading to a loss of the peculiar characteristics of the historical chestnut orchards, which does not include other species. A tendency that cannot be opposed by the landscape protection provided by the law (1497/1939 and 431/1985) not suited for this purpose. Further risks include intense attacks of cortical cancer on chestnut trees. Infections have indeed been reported in the area, but from a hypovirulent strain of the ascomycete *Cryphonectria parasitica.* In the past, cortical cancer of the chestnut took a heavy toll on the Vulture chestnut orchards, causing the conversion of many tall-tree orchards to coppice management (Fig. 21.1).

21.3 Pastures of the Murgia Materana (40° 38′ 48″ N; 16° 41′ 35″ E)

The pastures of the Murgia Materana extend over about 4,000 ha in a hilly area with altitudes between 200 and 520 m.s.l. The land is mostly privately owned. There are still some commons of limited extension in the township of Matera. The area can be reached from Bari by the SS 96 state road to Altamura, then the SS 99 to Laterza. It lies after the town of Laterza on the right side of the road. These pastures are prevalently included within the township of Matera, on the Laterza side. The area displays the typical features of the Murgia, being a plateau strongly characterized by the emergence of Mesozoic limestone. Karstic phenomena play a major role in determining the morphology of the area, the presence of canyons (*gravine*) being the most tangible evidence for this.

The Murgia Materana is distinguished from Upper Murgia not only by the singularity of its landscape, but also by human settlement going all the way back to the Paleolithic. The Murgia Materana is an outpost of the Puglian Upper Murgia in Lucania. Although separated by a valley called the Fossa Bradanica, the two areas share a common geological origin, as well as a common history of land use and a biodiversity ensured by the persistence of pastures. The area is of great importance for the conservation of biodiversity, especially as regards flora and fauna, and is therefore included in the Park of the Materan Murgia and one of the sites of the NATURA 2000 network. Many testimonies of the history of the area are kept at the "Domenico Ridola" National Museum in Matera, while testimonies from the Greek period (eighth–seventh century B.C.) and the Roman period (third century B.C. onward) can be found at various sites in the area. Scholars believe that back in those times the Murgia was inhabited by shepherds and herdsmen living in small villages created by adapting small natural caves. These communities were to place an indelible stamp on the man-nature relationship in the area. Here farmhouses, rock villages, and rock churches still retain the allure of cave settlements. Alongside cave dwellings were *jazzi*, that is, sheep-pens made with the comfort of the animals in mind, characterized by dry-stone walls, their being built along slopes, and a southern exposure. Rock architecture was also used for religious buildings in the area. Immigrant Greek religious communities from Sicily and Calabria, Benedictine monks, and later groups of Armenians, Jews, and Slavonians, each with their manners and customs, shaped caves into churches,

Fig. 21.2 The pastures of the Murgia Materana date back to the eighth century B.C. They show considerable landscape values due also to the geomorphology of the area

coenobia and chapels decorated with the typical architectural elements of Greek and Latin liturgy. Further spectacular testimonies of the relationship between man and nature date from the time span going from 1500 to the early 1900s. In this period, farmhouses and *jazzi* were built to answer the demands of the local agropastoral economy, as well as canals, settling vats, and water cisterns, connected by a still used road network extending all the way to the city of Matera. The denseness and expansion of the local canal network indicates that it was made to meet the needs not just of the population residing in the countryside, but also and especially of the flocks and herds. Critical lows in the water supply were obviously reached in the summer. Hence, the technologies employed had the main purpose of guaranteeing a summer supply. These technologies are interesting subjects for studies on the role of traditional knowledge in adaptation to climate change. All over the Park one still finds splendid rural mansions, including some fortified ones. These are drawing increasingly more tourists, who marvel at finding such an extraordinary cultural landscape in a protected natural area. The area also owes its archaeological significance to its many rock churches, built over a very long time span extending from the Early Middle Ages to the nineteenth century. Many fascinating rock-cut churches are found near small rural settlements or along the ancient routes connecting the town to the countryside. In these churches one recognizes architectural elements patterned after those of regular above-ground churches. The digging was carried out so as provide the indispensable elements of a cult building with minimum resource expenditure.

The landscape shows a good degree of integrity. Possible threats to a landscape of this type could come from individual harmful actions such as illegal waste dumping, or soil tillage. Such actions, however, are made difficult by the restrictions and controls applied since the institution of the Park. The true vulnerability factor of the area is the management of the pastures of the Murgia Materana. Pastures in pseudo-steppes are secondary formations derived from disturbing factors—notably fires and grazing—which over time curbed the natural dynamism of the vegetation, allowing the present landscape to form. A prolonged absence of these factors would allow the native forest vegetation—probably consisting originally of deciduous thermophilic oak groves—to colonize the area again, leading to the loss of the historical landscape (Fig. 21.2).

21.4 Olive Orchards of Ferrandina (40° 30′ 00″ N; 16° 27′ 00″ E)

The area extends over about 800 ha in a hilly area with altitudes between 150 and 450 m a.s.l.. It is mostly privately owned and lies within the municipality of Ferrandina, in the province of Matera. This is the most important olive-growing district in Lucania, with interesting ramifications also outside of Ferrandina, near the communes of Miglionico and Grottole. The area is reached by the Basentana state road (SS 407). One exits at the Ferrandina/Scalo junction and continues towards Ferrandina. Geomorphologically the area belongs to the Basento Valley. This is characterized by *calanchi* (gullies), although these are actually more frequent on the hills on the opposite versant of the olive-covered hills slopes of Ferrandina. The exposure of the farmed areas is variable, although eastern exposures prevail. Terraces can be sometimes seen on especially steep slopes. The olive orchards extend over a hilly environment with highly incoherent clayish soils, and often in conditions of accentuated acclivity. This morphology can easily result in erosion and instability, as the frequency of gullies in the area bears out.

The district of Ferrandina owes its significance to the local importance of the olive-growing tradition, whose beginnings date back to the Great Greek period, although the area was initially colonized in the eighth century B.C. by the Aenotrii, who penetrated the interior of the region following river valleys. Olive trees thus strongly characterize the local landscape, especially in the Ferrandina countryside, where the orchards alternate with arables, vegetable gardens and xerophilic woods with a prevalence of deciduous thermophilic oaks. The olive-growing area mainly extends on the hill slopes overlooking the Valley of the Basento, one of the most important watercourses in Basilicata. Olive orchards also extend along the whole course of the Basentana road in the direction of Metaponto. Here, however, they alternate with citrus orchards, which gradually prevail as one approaches the coast. The historical value of the Ferrandina olive orchards is borne out by their high number of centenary specimens. Another important aspect is that the area boasts an autochthonous cultivar, the *Maieatica*. The use of olives in unique cuisine recipes, deeply rooted in local

Fig. 21.3 The importance of the olive orchards of Ferrandina lies in the presence of centenarian trees and an autochthonous cultivar, the *Maieatica*

tradition, such as the "Ferrandina black olives", are a tangible testimony of the intimate connection between olive-growing and the local culture. According to local lore, oven-baked olives were part of the rations of Greek and Roman soldiers. A few kilometers northwest of the town of Ferrandina, on the ridge of a hill, is the castle of Uggiano (Obelanum), which dominates a vast landscape extending between the Basento valley and the Vella and Salandrella rivers. This architectural complex is now reduced to a few ruins, but it originally extended over quite a large surface. Around its walls was an urban settlement of which only scarce vestiges remain. The castle is mentioned as early as the Lombard period in connection with the division of southern Italy between Radelchis and Siconulf in 845. It was expanded during the second Byzantine colonization and conquered by Robert Guiscard in 1066. It reached the peak of its splendor with its renovation under the Angevines, completed in 1350. Today around the ruins of the castle are fields with sparse olive trees, also used for grazing, which are a fascinating aspect of the local landscape.

The olive-growing district shows a good degree of integrity. Because of the especially high incoherence of the geo-pedological substratum of the area, one of its main vulnerabilities is the high instability of its versants, where erosion forms gullies (*calanchi*) and causes numerous landslides. In 1960, a landslide entirely destroyed 100-hectares of olive orchard at Castelluccio. The abandonment of the countryside and consequent interruption of normal farming practices are another major risk factor for the terraced olive-growing district of Ferrandina. Physical aspects aside, other vulnerabilities are connected to the political management of the olive-growing sector. The low competitiveness of the local olive production compared to that of

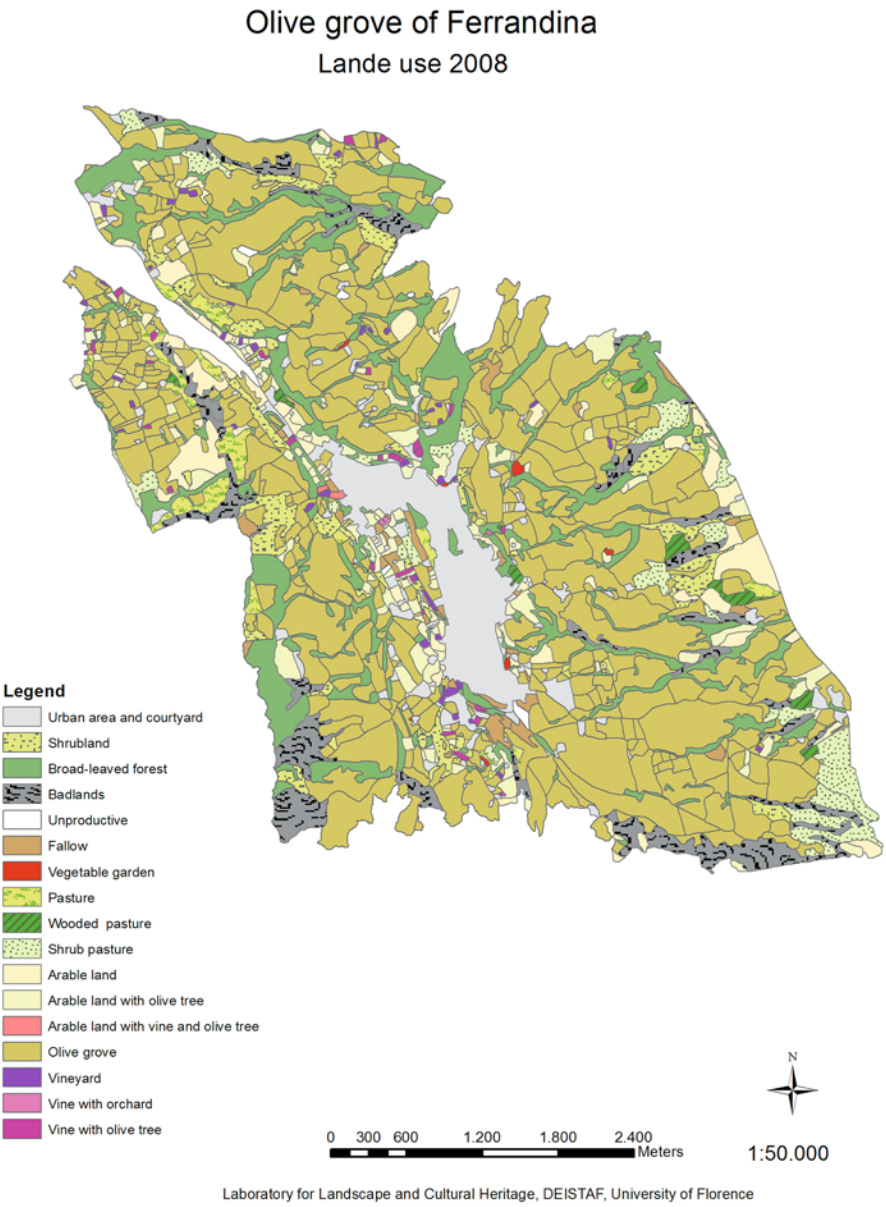

Fig. 21.4 The district of Ferrandina owes its significanceto the importance of the olive-growing tradition, whose beginnings date back to the Great Greek period, although the area was initially colonized in the eighth century B.C. Therefore, this historical landscape is almost 3,000 years old. Currently olive orchards holds 52 % of the territory and the landscape shows a good degree of integrity. The landscape mosaic has a reduced degree of fragmentation, since 70 % of the area is dominated by two categories of land use, namely, olive groves and woodlands

neighboring regions; excessive fragmentation of property; a scarcity of specialized labor; the lack of an organic development plan; the lack of a Protected Origin Denomination brand (even if Ferrandina Olives are a Slow Food Presidium and they are recognized as a Traditional Food Product by the Ministry for Agricultural, Alimentary and Forest Politics): all these factors can pose a threat to the survival of this historical cultivation in the Ferrandina countryside. Another element of vulnerability is a trend to intensification of production that could compromise local landscape values (Figs. 21.3, 21.4).

Land use 2008	Surface (ha)	Surface (%)
Urban area and courtyard	166.68	7.53
Shrubland	88.65	4.00
Broad-leaved forest	298.74	13.49
Badland (*calanco*)	127.95	5.78
Unproductive	3.87	0.17
Fallow	27.88	1.26
Vegetable garden	2.36	0.11
Pasture	40.95	1.85
Wooded pasture	12.78	0.58
Shrub pasture	74.08	3.35
Arable land	101.91	4.60
Arable land with olive tree	92.18	4.16
Arable land with vine and olive tree	0.99	0.04
Olive grove	1,156.55	52.23
Vineyard	10.42	0.47
Vine with orchard	0.59	0.03
Vine with olive tree	7.70	0.35
Total	*2,214.27*	*100.00*

Evaluating indices of landscape	
Number of land uses	17
Number of patches	1,211
Total surface area (ha)	2,214.27
Average surface area of patches (ha)	1.83
Average surface area of arable land patches (ha)	1.67
Average surface area of pasturepatches (ha)	2.61
Average surface area of forest patches (ha)	1.04
Hill's diversity number	1.24
Class of landscape integrity (I–VI)	IV

21.5 Vineyards of Aglianico in the Vulture (40° 55′ 00″ N; 15° 40′ 00″ E)

This vineyard area extends over about 1,500 ha on the foothills of the Vulture, with north-east-south exposures at lower altitudes. Here we will focus on the Aglianico del Vulture vineyards in the Vulture area (between Melfi and Atella), which are as a rule

privately owned. The wine-growing area of Aglianico del Vulture wine is actually vaster, extending outward from Vulture to encompass neighboring districts to the south and southeast. The area falls within the municipalities of Rionero in Vulture, Barile, Rapolla, Melfi, Ginestra, Ripacandida, Atella, Maschito, Banzi, Genzano, Forenza, Acerenza, Venosa, Lavello, and Palazzo San Gervasio. It can be reached from the Bari-Napoli highway by taking the Candela exit and driving in the direction of Potenza. It comes into view a few km after the Melfi exit and extends along the road all the way to Rionero as one drives towards the Monticchio lakes. The vineyards mainly grow at altitudes between 200 and 700 m a.s.l. on the clayish tuffaceous soils of pyroclastic origin of the Vulture volcano.

The area owes its significance not only to the high aesthetic value of its vineyards—which harmoniously fit into an especially remarkable landscape mosaic, to be included in the future Vulture Regional Park—but especially to the fact that the Vulture is the historical district of Aglianico wine in Basilicata. The historical character of local viticulture is a strong added value for the vineyards of the Vulture area. Wine-growing in the area goes all the way back to the seventh or sixth century B.C. The local vine may derive its name from "Ellenico", which evolved into "Aglianico" in the sixteenth century, when the Kingdom of Naples was under the rule of the Aragonese. Other scholars believe, on the basis of careful reading of the classics, that the point of departure was Gauranum, one of the types of Falernum, mentioned by Pliny and Atheneus. The name Aglianico is derived, according to these scholars, from the corruption of the ancient names Gauranico or Giurano, which turned into Glinico or Glianica, as the vine is still called in many Lucanian and Irpinian villages. In any case, a crucial impulse toward the spread of viticulture in the area came from the first Greek colonies, when wine became an object of trade between peoples. One of the main strengths of Aglianico del Vulture wine is its high quality. It is appreciated worldwide, has obtained a DOC (Controlled Origin Denomination), and will soon be granted a DOCG (Controlled and Guaranteed Origin Denomination) as well. From a landscape point of view, the vineyards form small patches in a heterogeneous landscape of chestnut groves, woods mostly of Turkish oaks, reforested areas and arables in the highest zones of the Vulture area; olive orchards, arables, and patches of xerophilic woods of deciduous oaks on the lower slopes. In areas adjoining the Vulture district, the vineyards are fitted in a landscape dominated by arables, with sizable woods in places, mostly of *Quercus cerris.* The importance of the wine-growing culture among the people of the Vulture is reflected in a whole range of events, festivals, and initiatives promoting what is much more than a mere farming activity in the Vulture area. Viticulture is an ancient tradition that has kept renewing itself, becoming an expression of the character of the local people and a resource for the promotion and economic development of the area. Many of the vineyards are very old and have been handed down in farming families. This aspect and the presence of ancient cellars dug into the native volcanic tuff, many of which have been restored, enhance the traditional value of wine-growing in the Vulture area.

The area shows good integrity, with espalier vineyards of variable extension harmoniously alternating with olive-orchards, family vegetable gardens, and patches of

Fig. 21.5 The Vulture is the historical district of Aglianico wine in Basilicata, dating back to the seventh century B.C

xerophilic woods on the lower slopes, and bordering on chestnut groves at higher altitudes.

The most vulnerable vineyards are in the sub-mountainous area, where the lower temperatures can place a strain on the typically sub-Mediterranean local grapevine species, *Vitis vinifera*, resulting in a longer harvesting time and a consequent lower quality of the wine. Other vulnerabilities arise from the replacing of traditional methods with modern growing and planting techniques (Fig. 21.5).

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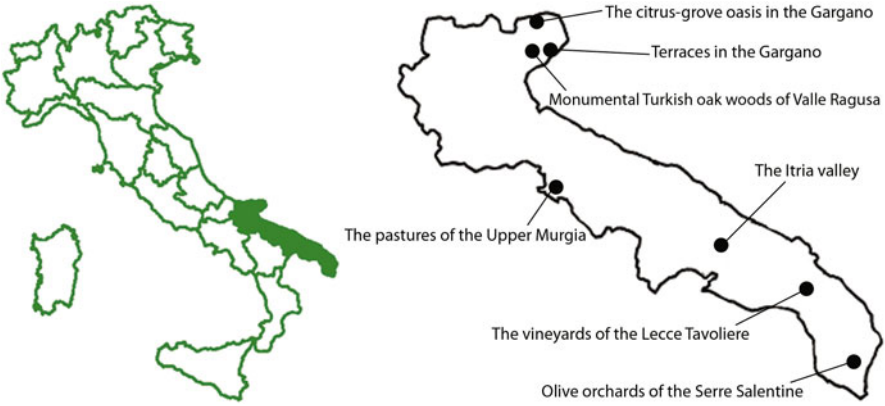
Chapter 22
Puglia

Saverio Russo



22.1 Introduction

The selected areas of Puglia illustrated below obviously are not representative of the wide range of historical rural landscapes described and documented in the region during the past centuries, as even a cursory examination will reveal. The agrarian cadaster of 1929 documents a crop distribution pattern that was the result of a long historical evolution. In particular, the expansion of vineyards in the second half of the nineteenth century gave rise to one of the defining features of the Puglian traditional landscape. Using this cadaster as our main source, we can single out the following rural environments, a significant part of which is still observable today:

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- The area of bare fields, which slopes down from the Fortore southward to the Fossa Bradanica area, with some branches extending all the way to the Ionian Sea. This area is characterized by large holdings with grain fields, or grain fields and pastures, and typical farmhouses.
- The area of naked or treed pastureland, which was strongly reduced in the second half of the nineteenth century. This landscape has almost disappeared in the Foggia portion of the Puglian plateau (the "Tavoliere"), except for its eastern part. It is still found, instead, in the plateaus of western Gargano, as well as the Murgia area in the province of Bari, between Spinazzola and Noci.
- Forests, which are almost gone in the Murgia barese, are still abundant on the Gargano promontory, more scattered on the Daunian Subapennines, and again prominent in the landscape of northern Terra d'Otranto, between Mottola and Martina Franca.
- Olive groves. As Leandro Alberti observes, in the early 1500s these formed a true forest, completely dominating, except for a few almond groves, the coastal strip extending from Trani southward almost to Taranto. For centuries they have been abundant in the Salento and along the southern and northern coast of the Gargano, and recently also in the northern and southern Foggian Tavoliere. In the coastal strip extending between Monopoli and Fasano, south of Bari, and in the Salento, there are many centuries-old olive groves with monumental trees of sculptural beauty.
- Vineyards. These once had a more scattered distribution than olive trees and were usually found around inhabited centers. They became widespread especially in the second half of the nineteenth century, becoming a significant landscape feature in many areas, including the Sanseverese; the southern Foggian Tavoliere; the foothills of the Murgia barese on the Adriatic side, between Barletta and Ruvo; the opposite versant of the Murge, between Minervino and Spinazzola; the area between Ostuni and Martina in Terra d'Otranto; the plain of Brindisi; the Lecce Tavoliere; and the Murge of Taranto in the area of Sava and Manduria.

This is merely a rough outline. Mention is also due to wooded arables, although these are much less prominent in Puglia than in other southern Italian regions, and especially to the not infrequent association of tree and shrub crops. The region is largely dominated by farmland, which extends over 65 % of its territory, with woods accounting for just 9.2 % and pastures for a mere 4.7 %.

The old citrus oasis in the Gargano also deserves mention, as do the equally traditional horticultural areas along the coast, for example between Zapponeta and the Ofanto river, and further south between Mola and Polignano. The land-use map of 1959 generally confirms this crop geography, although with the significant innovation of the spread of new rural settlements and buildings—villages, service centers, farms—in vast areas of the region's territory. A significant growth of spontaneous vegetation is observable today, especially of maqis and forest, whose surface, in spite of fires, has expanded far more than reforestation by human beings could account for. Along with this phenomenon—which is especially remarkable in the Daunian

Subapennines and in the Gargano—some important processes of agricultural intensification in the plain (fruit orchards and horticultural and industrial cultivations) made possible by irrigation are also noteworthy.

Another element threatens the Puglian landscape, viz., uncontrolled urban expansion in many areas, especially along the coast, which has led to a tenfold increase of the region's built-up surface.

22.2 Monumental Turkish Oak Woods of Valle Ragusa (41° 45′ 55″ N; 15° 50′ 53″ E)

The monumental Turkish oak woods of Valle Ragusa extend over about 20–30 ha in a forest of over 5,000 ha, about 1,000 of which are covered with Turkish oak woods. They lie in the municipality of Monte Sant'Angelo in the province of Foggia. Altitudes vary between 580 and 800 m a.s.l.. The land is owned by the town and is included in the Gargano National Park, the "Promontorio del Gargano" SPA, and the Bosco Quarto-Monte Spigno SCI. Furthermore, it is under landscape restrictions as per law 431/85. The Turkish oak woods can be reached by a road branching out from SS 272 at km 44 into the vast municipal district of "Bosco Quarto". This narrow road, which is asphalted only part of the way, runs along the upper part of Valle Ragusa. From here one can take a cart track that crosses the whole valley bottom to the provincial road from S. Giovanni Rotondo to Carpino (locality of Pezzente). The area is characterized by low relief and gently sloping valleys running from east to west. The land is mainly constituted of brown earth on a limestone matrix. There are also some modest pyroclastic deposits from eruptions of the Vulture. The geological substratum is a calcareous-dolomitic marine series that deposited between the upper Jurassic and the Cretaceous in back reef, reef, fore-reef and open sea facies. There are traces of abundant fauna including bivalves, gastropods, hydrozoa, corals, and not infrequently algae as well.

The area owes its significance to the historical persistence of monumental woods with very ancient origins, whose timber was used for centuries by local populations for the building of ships and railroad crossties. A number of authors of the Roman period bear witness to the antiquity of human presence in this area, where many churches were formerly pagan temples. The woods of Valle Ragusa feature Turkish oaks (*Quercus cerris L.*) in the dominant level and a thick understory of white hornbeam (*Carpinus betulus L.*). The Turkish oaks are of monumental sizes, often exceeding 3 m in circumference and 20 in height. Their wood is suitable for the production of planks for shipbuilding and railroad crossties, the two main economic uses it was put to in the course of history. The area is probably representative of the features of the whole Bosco Quarto until the early twentieth century, when the woods in the district underwent industrial cutting that led to age homogenization of a vast portion of the municipal territory. The Bosco Quarto belonged to the Grimaldi fief until the early nineteenth century. Researches in the historical archives of the commune of Monte Sant'Angelo have exposed an example of poor management of one

Fig. 22.1 The monumental Turkey oak wood of Valle Ragusa is a testimony of the historical importance of this forest for shipbuilding and the production of railroad sleepers

of the most extensive woods in Puglia, against the advice of Prof. Lodovico Piccioli, a professor at what was then the Regio Istituto Superiore di Vallombrosa and later became the Università degli Studi di Firenze. Some believe that the valley derives its name from people migrated here from Ragusa, present-day Dubrovnik, in Croatia, on the opposite side of the Adriatic. It is indeed quite possible that the Ragusans had an interest in the Gargano woods, considering the importance of naval construction for the "Ragusan Republic", a commercial rival of Venice whose first ships arrived in English ports loaded with merchandise as early as the sixteenth century. According to Braudel, the Ragusans procured timber in the oak forests of Monte Gargano, also known as Monte Sant'Angelo. It is this wood, argues Bartolomeo Crescenzo, that gave them their edge over the Portuguese, who would have had the best galleons in the world if they too had had a Monte Sant' Angelo. An old Decauville forest railway runs on the road leading into the forest. It was built in the early 1900s to transport lumber for crossties at a time when the national railway was expanding.

The area has a good degree of integrity, thanks to the presence of semi-coetaneous monumental Turkish oaks, although associated with white hornbeam and, in lesser

proportion, field maple in the understory. The wood thus has a stratified, two-tiered structure. Grazing animals help to keep the wood floor clear. The area could provide a model, also employable for the teaching of university students, of the compatibility of different land uses, and thus of different interests that can coexist very well in a sustainable normative and management context. Indeed, the area could become a paradigm for the management of historical Turkish oak woods. It has even been nominated for inclusion among UNESCO heritage sites.

As regards vulnerability, the highest risk from the point of view of conservation is the interruption of care as a result of abandonment. This is causing periodic collapses of Turkish oak trees which are then replaced by white hornbeam, which is skiaphilous and hence thrives even in the shade. In spite of the abundant seed produced by the Turkish oaks, because of the hornbeams' light-robbing foliage the new trees do not grow beyond the seedling stage. Hence the need to undertake adequate silvicultural action to assist the renewal of the Turkish oaks. If this is not done, it is expectable that the Turkish holm oak will be eventually totally replaced by the white hornbeam. Furthermore, a number of trees shows more or less extensive rotting in the basal part of their trunks. This is due to their age, which is now well over 140 or 150 years. Fortunately, however, so far no diseases have been observed (Fig. 22.1).

22.3 The Citrus-Grove Oasis in the Gargano (41° 54′ 58″ N; 15° 51′ 50″ E)

The citrus groves along the north coast of the Gargano promontory lie in the municipalities of Rodi Garganico, Vico del Gargano and Ischitella, all in the province of Foggia. They occupy an area of about 850 ha, privately owned, with altitudes ranging from 0 to 350 m a.s.l.. Part of the area lies within the Gargano National Park and is under landscape restrictions as per laws 1497/39 and 431/85. The citrus oasis can be reached by exiting the A14 at Poggio Imperiale-Lesina and taking the SS 693 to Ischitella another 54 km away. To reach Rodi one exits SS 693 2 km before Ischitella and takes SS 89. From San Severo one can take the Ferrovie del Gargano train and get off at Rodi or San Menaio. The geomorphology of the area is typical for the northeast part of the Gargano promontory, being modeled by *valloni* (gorges) radiating out and converging into the sea. The sides of the gorges are scarred by deep torrent incisions along which are cultivated plots on contour terraces and dry-stone walls. The geological substratum is constituted by the Formazione di Rodi Garganico, characterized by whitish or yellowish marl limestone frequently interspersed with red or pink flint.

The area owes its significance to the historical persistence of an ancient tradition of citrus growing. The citrus, prevalently oranges and lemons, are grown around what can be called the only permanent stream of Gargano, the *vallone* Asciatizzo, fed by numerous springs lying along its course. Citrus growing in the area is certainly attested since the late Middle Ages. At this time the fruit was the *melangolo* or *pomo citrino* (bitter orange), the only variety of orange known in the Mediterranean

before the introduction of the sweet orange in the second half of the 1500s. The local lemons and *melangoli* found important outlets as early as the second half of the 1600s on the markets of Venice and the Habsburgic upper Adriatic (Trieste). Later, after the unity of Italy, citrus-growing developed rapidly in the Gargano, as in Sicily, and met with extraordinary productive and economic success. The area became third in Italy in yields and first in profit per unit, thanks to sustained demand from central Europe and, above all, the United States. Production attained 260,000 quintal at the beginning of the 1900s. A significant factor in the commercial success of Gargano citrus was undoubtedly its late maturation (April–May), at a time when the harvest had long since been completed in other citrus-growing areas. Another significant factor was the great durability of the fruit, which could endure long voyages without deteriorating. The landscape is shaped by the high-yield Gargano citrus groves screened by long masonry windbreakers with large windows, or by rows of holm oak, laurel, or evergreen pistache, As an alternative to these kinds of screens, *canneti* are also employed, that is, rows of dry reeds held together by transversal reeds. A network of runnels and ponds fed by the Asciatizzo torrent was used to irrigate the plants. Tenant farmers and sharecroppers lived in small houses scattered around the citrus oasis, or sometimes in larger ones (*casini*) also including rooms for the processing of the fruit and for the use of the farm owner. The local orange—more abundant than lemon—is the "biondo comune del Gargano", the earliest and most typical variety in Mediterranean citrus areas before the 1960s. Among several varieties of *biondo* oranges, the "Duretta del Gargano" stands out. It is a variety exclusively found in Gargano, of unknown origin, but great value, as it matures very early and has special organoleptic qualities. All the local oranges have been granted PGI certification under the designation "Arancia del Gargano". A common local lemon is the "Femminello comune", a very old variety that is presently also PGI-certified, but there are also some very rare varieties, such as the *sanguigno* (blood-red) lemon. All the citrus of the Gargano are a Slow Food presidium. The crop has put its stamp on local society. The patron saint of Vico, Saint Valentino, is carried in procession on February 14 among garlands of oranges and lemons, and is believed to protect citrus groves from frost.

The citrus oasis maintained the integrity of its main components at least as late as the 1950s or 1960s, and is still sufficiently preserved today. Structural elements such as windbreakers are still essentially intact today. However, many plots have been abandoned, as a result both of gradual changes in cultivation methods and of the introduction of chemical fertilizer instead of manure, or motor hoes instead of hand-held ones. Nevertheless, the citrus groves of the Gargano are the only ones in Italy in which the ancient traditional varieties are still grown.

The oasis' survival is threatened by the expansion of second homes and the tourist facilities of the nearby coast, as well as low profit margins that, in spite of PGI certifications, do not make up for the rather high cultivation and maintenance costs. A further problem is low generational turnover among farmers (Fig. 22.2).

Fig. 22.2 Well known since the Early Middle Ages as *pomo citrino*, the bitter orange was the only variety of orange known in the Mediterranean before the introduction of the sweet orange in the second half of the 1500s

22.4 Olive Orchards of the Serre Salentine (39° 54′ 18″ N; 18° 17′ 34″ E)

The area selected as representative of the olive groves of Salento extends over 680 ha in the municipality of Alessano, in the province of Lecce. The land is mostly privately owned, with altitudes between 100 and 180 m a.s.l.. Alessano lies along SS 16, which goes from Lecce to Santa Maria di Leuca, splitting Salento in two, and becomes SS 275 in its last stretch. The olive-growing area lies northwest of the town. The Serre Salentine are a triple series of sub-hill rises running parallel to the Apennines and converging at Capo di Leuca. The geological substratum is composed of Salento calcarenites, constituted of calcarenite, coarse-grained limestone, and more or lest cemented calcareous gravel, and, in lesser quantities, weakly cemented grayish clay sands (Gallipoli Formation) and gray and hazelnut irregularly fractured compact limestone (Melissano Limestone). There is a remarkable presence of underground aquifers and wells called *vore*.

The area owes its significance not only to the historical persistence of a centuries-old crop, but also by its inclusion within a peculiar settlement fabric, a myriad of micro-settlements, mostly small rural centers, which become denser as one goes down towards Capo di Leuca and are surrounded by lush centuries-old "olive woods". Some wooded areas near Supersano deserve mention. The area was settled in ancient times. It is characterized by the coexistence of extreme fragmentation of land

ownership and large holdings. Here one still finds significant rural farm buildings and other remarkable structures, including dry-stone walls marking the borders of the small holdings; rectangular monoliths stuck into the ground, the so-called "menhirs", such as at Supersano and Patù, where an important ancient monument, the Centopietre, also lies; and mounds of large stones known as *specchie*, found, for example, at Presicce, Patù, and Supersano. The farmhouses here are rarer than in the eastern Serre. They are not large and comprise more than one building. Historically regarded as the poorest and most desolate area in the Salento, today it is putting its stakes on tourism and olive oil production. Some especially interesting actions are under way to create "paths for the PDO 'Terra d'Otranto' extra-virgin oil" and promote cooperation to improve the production and commercialization of this oil. The historical "olive woods" landscape area is occupied by 16,733 ha of olive plots out of an overall agricultural surface of 25,982 ha. The landscape of the olive groves extends over 64.4 % of the cultivated surface.

The area still retains its integrity. After its depopulation, which began in the Fifties and went on until a few years ago, today it is investing in its agricultural resources and cultural heritage, and especially on agritourism. Part of the Serre still display with more integrity than elsewhere the dominating features of the Salento rural landscape, with its especially intriguing alternation of stones and olive trees. The retaining of this strong traditional character is due both to agronomic reasons—transformations are typically more limited in olive-growing areas—and to social and productive ones, especially the prevalence of smallholdings. This preservation is especially remarkable considering the serious drops in productivity that have heavily impacted the rural landscape of the lower Salento over the last two centuries, leading to the destruction of thick olive woods.

As regards vulnerability, there are some critical factors, some chronic in nature, that are worth pointing out. Notably, uncontrolled, when not outright illegal, urban expansion is degrading the landscape's consistency and character. Besides, over the last two decades, a massive migration of labor away from the agricultural sector has undermined the local population's originally strong and direct bond with the land. This has led to the gradual reversion of areas with strong agricultural vocations to situations of higher naturalness, which is not necessarily a positive outcome if we value cultural landscapes. In the specific case of olive groves, the intensification of agriculture has led to a reorganization of the production chain and of the historical and cultural significance of olive-growing. Notably, changes in tree spacing, the modernization brought by drip irrigation, the introduction of higher-yield olive-tree variants, and the use of chemical products and mechanical equipment to gather the olives and clear out the underbrush, have spelled the end of olive-gathering and tree-care practices going hundreds of years back. These changes have especially affected low-yield centenary trees. Besides, the intensification of olive-growing is leading to a strong loss of field biodiversity, which now tends to concentrate in the proximity of the dry-stone border walls. Valuable elements of the olive landscape have disappeared, such as carob trees, which used to play an important role in the diet of local peasants. Finally, it is also useful to mention that a number of specializations reflecting a direct bond between the people and the land are all but lost. As regards

Fig. 22.3 The century-old *olive woods* of the Serre salentine, with their traditional dry stone walls, are one of the many historical landscapes of Puglia

the olive groves, in particular, such specialists include experts in the building of dry-stone walls and olive pruners; the latter, in particular, is a skill that today is as sought after as it is rare (Fig. 22.3).

22.5 The Pastures of the Upper Murgia (40° 59′ 12″ N; 16° 15′ 32″ E)

The selected pasture area extends over 2,000 ha on the highest terraces of the Murgia plateau, within the municipalities of Gravina and Spinazzola, in the province of Bari. The land is mostly privately owned, with altitudes between 500 and 635 m a.s.l. The area is partially included in the Alta Murgia Natural Park and the "Murgia Alta" SCI and SPA. The pastures can be reached by SP 230, which leads from Spinazzola to Gravina, where one turns left onto SP 39 and drives to Garagnone, in the middle of the selected area. Geologically, the area extends onto a calcareous substratum known as Altamura Limestone, consisting partly of light-colored and fine-grained, sometimes slightly Dolomitic limestone, and partly of large banks of whitish, finely detrital limestone known as Bari Limestone. The area's karstic nature is manifested in sometimes spectacular ways. Slopes are gentle in the upper reaches of the plateau, harsh and craggy along the scarp separating the Murgian Mesozoic calcareous block from the Fossa Bradanica.

Fig. 22.4 The Upper Murgia is characterized by a network of many stone rural buildings dotting the pastures

Land use 2010	Surface (ha)	Surface (%)
Water body	3.32	0.11
Urban area and courtyard	10.47	0.33
Shrubland	2.06	0.07
Mineral extraction site	2.37	0.08
Grazed forest	0.96	0.03
Fruit orchard	12.83	0.41
Fallow	7.48	0.24
Jazzi (dry-stone sheep enclosures)	10.00	0.32
Pasture	1,649.87	52.43
Wooded pasture	209.15	6.65
Conifer afforestation	149.49	4.75
Arable land	1,086.88	34.54
Vineyard	1.90	0.06
Total	*3,146.79*	*100.00*

Evaluating indices of landscape	
Number of land uses	13
Number of patches	676
Total surface area (ha)	3,146.79
Average surface area of patches (ha)	4.66
Average surface area of arable land patches (ha)	4.49
Average surface area of pasture patches (ha)	7.12
Total length of dry stone walls (m)	87,432
Average length of dry stone walls (m)	136.4
Hill's diversity number	3.09
Class of landscape integrity (I–VI)	VI

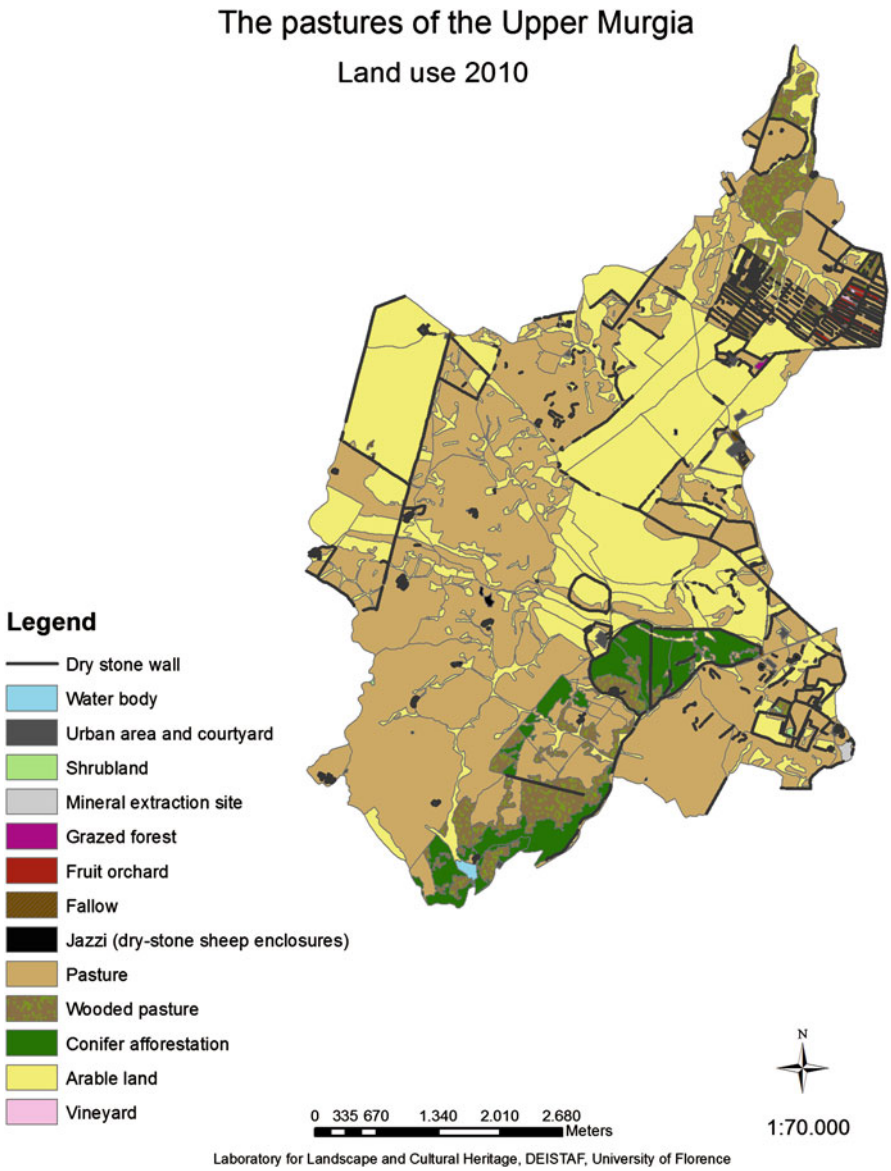

Fig. 22.5 The pastures of the Upper Murgia are characterized by large semi-natural grassland, arable land and orchards, especially almonds, that still retain the traditional subdivision with dry stone walls. Pastures, in these pseudo-steppes, are secondary formations derived from fires and grazing—which over time curbed the natural dynamism of the vegetation, allowing the present historical landscape to form. Today the landscape is dominated by simple pastures (52.4 %), wooded pasture (6.6 %) and arable land (34.5 %). The mosaic is typical of extensive landscapes with patches of large size. The north, where the almond groves are concentrated, retains rather small plots, divided by dry stone walls. The landscape shows a high degree of integrity, but the vulnerability of the area concerns grazing. A prolonged absence of grazing animals would allow the native forest vegetation to colonize the area again, leading to the loss of the historical landscape and the biocultural diversity associated to it

The area owes its significance to the persistence for centuries of a land management system that has given rise to a particular landscape, a result of the interaction between man and the local karstic environment. It is characterized by vast semi-natural pastures and small and sparse rural stone constructions. The area's historical land use is connected to the "Dogana della Mena delle Pecore di Puglia"—a state organization set up to collect tolls along the main transhumance route from winter pastures in Puglia to summer pastures in Abruzzo—as well as shorter range transhumance. Shepherding has left a deep mark on the district, where the permanence of grazing grounds is associated with numerous testimonies of pastoral civilization. Once crossed by the Melfi-Castellaneta sheep-track, the area is still dotted with farmhouses and *jazzi* (dry-stone sheep enclosures). Thus, it still retains the features of the vast pastoral spaces that extended over much of northern Puglia from the Middle Ages to the mid nineteenth century. Vestiges of the imposing Rocca del Garagnone add to the beauty of the landscape. The area is crisscrossed by small roads or trails that were often originally old sheep-tracks. Besides being a valuable testimony of the pastoral society that for centuries modeled the landscape of Upper Murgia, the area has significant naturalistic value. It houses rare plant species of great biogeographical interest, priority habitats, and rare bird species.

The landscape's degree of integrity is still high, although this is true of not too large pasture areas that no longer form a continuous landscape, but a highly fragmented mosaic. Here one often runs into abandoned almond orchards, tangible testimonies of a once widespread cultivation that was especially suited to the local bioclimatic context, but is now on the decline in all of Puglia, having become unprofitable.

The area's vulnerability is high, due to widespread degradation, illegal waste dumps, and soil tillage. The application of new restrictions and controls since the institution of the National Park in Alta Murgia in 2004 has made these practices more difficult, and fortunately put a stop to the removing of rocks from the upper Murgian pastures. The installing of wind turbines in the Minervino countryside undoubtedly has also had a significant impact on the local landscape, considering its strong historical and traditional character. At any rate, presently the area's principal vulnerability factor is connected to pasture management. Pastures in pseudo-steppes are secondary formations derived from continuously occurring disturbing factors—notably fires and grazing—which over time curb the natural dynamism of the vegetation. A prolonged absence of such factors in our area would thus favor the reversion to the natural vegetation that thrives in the local climate, a deciduous thermophilic oak forest. Such processes are actually already under way and are especially conspicuous in some areas of Upper Murgia (Castel del Monte, Montegrosso, etc.). Priority should hence be given to measures to protect pastoral activities by clearing out infesting vegetation and preserving traditional constructions (*jazzi*, *masserie*), some of which date all the way back to the late Middle Ages. While some pastures were abandoned and taken over by natural vegetation, others were intentionally replaced by fields, especially of grain, from the 1970s onward, or were reforested. As a consequence, pastures are no longer the dominant landscape feature in the area (Figs. 22.4, 22.5).

22.6 Terraces in the Gargano (41° 41′ 58″ N; 15° 57′ 53″ E)

The area features extensive terracing over a total surface of 4,000 ha on the southern versant of the Gargano, within the municipalities of Mattinata and Monte Sant'Angelo, in the province of Foggia. It lies within the Gargano National Park and in two SCI and one SPA. It is also protected by landscape laws 1497/39 and 431/85. Ownership is mainly private. The area is accessed from state road SS 89, from Macchia to Monte Sant'Angelo and from there to Mattinata. The Gargano is an imposing calcareous complex shaped by intense karstification, with a prevalence of Cretaceous, hippuritic or dolomitic limestone. Its southern part is characterized by whitish limestone strata with altitudes ranging between 100 and 750 m a.s.l., onto which the terraces extend. These are more frequent in the territories of Mattinata and Monte Sant'Angelo along the versants of deeply eroded karstic valleys cutting across what were once precipitous scarps.

The area owes its significance to several factors, including its imposing, monumental terraces and the exceptional scenic beauty of the steep southern versants of the Gargano looking out onto the Tavoliere tableland, which extends outward as far as the eye can see. For centuries the rockiness of the area's soil and the steepness of its slopes forced the locals to build artificial terraces and cover the benches dug into the native rock with soil very laboriously transported up from valley deposits. The terraces, as someone wrote, are the backbone of the Gargano's fragile agrarian landscape. As the geographer Baldacci observed, they often had to be rebuilt time and again: "After a rain [. . .] destroyed in a second the work of a whole generation [. . .] one is sure to see the Gargano farmer clambering up the steep slopes, rebuilding his land." Along with its distinctive landscape features, the area is interesting for its

Fig. 22.6 The terraces with olive and almond trees in the Gargano area constitute a landscape system with outstanding historical and scenic values

remarkable variety of crops, made possible by its pedoclimatic diversity. Olives typically associated with almonds, are grown on the lower terraces (100–400 m a.s.l.); only almonds, due to high windiness, on the middle versants (400–600 m a.s.l.), often in association with pulses and especially cereals. The terraces extend into the outskirts of the town of Monte S. Angelo. Here poor farmers had—and in part still have—vegetable gardens, arables, and small vineyards. In the past much of the grain production of Monte Sant'Angelo came from the terraces. These still preserve the rich heritage of fruit-tree species and varieties (grapevine and fruit-tree

Land use 2010	Surface (ha)	Surface (%)
Bare rock	58.77	2.40
Urban area and courtyard	133.46	5.45
Shrubland	88.25	3.60
Mineral extraction site	1.97	0.08
Recreational area	1.19	0.05
Woodland	214.46	8.75
Conifer forest	50.62	2.07
Fruit orchard	0.83	0.03
Terraced orchard	85.05	3.47
Fallow	51.45	2.10
Terraced fallow	865.85	35.35
Terraced olive grove with fruit orchard	21.86	0.89
Olive grove	23.98	0.98
Terraced olive grove	167.96	6.86
Vegetable garden	0.56	0.02
Terraced olive grove with vegetable garden and fruit orchard	1.21	0.05
Terraced vegetable garden	6.05	0.25
Pasture	24.40	1.00
Wooded pasture	12.86	0.52
Terraced shrub pasture	519.66	21.21
Pasture with almond tree	2.66	0.11
Terraced pasture	51.65	2.11
Terraced pasture with almond tree	60.61	2.47
Arable land	0.27	0.01
Arable land with olive tree	3.25	0.13
Stazzi (dry stone shelter of the shepherds)	0.77	0.03
Total	*2,449.6*	*100.00*

Evaluating indices of landscape	
Number of land uses	26
Number of patches	442
Total surface area (ha)	2,449.67
Average surface area of patches (ha)	5.54
Average surface area of arable land patches (ha)	2.07
Average surface area of pasture patches (ha)	11.39
Hill's diversity number	8.38
Class of landscape integrity (I–VI)	V

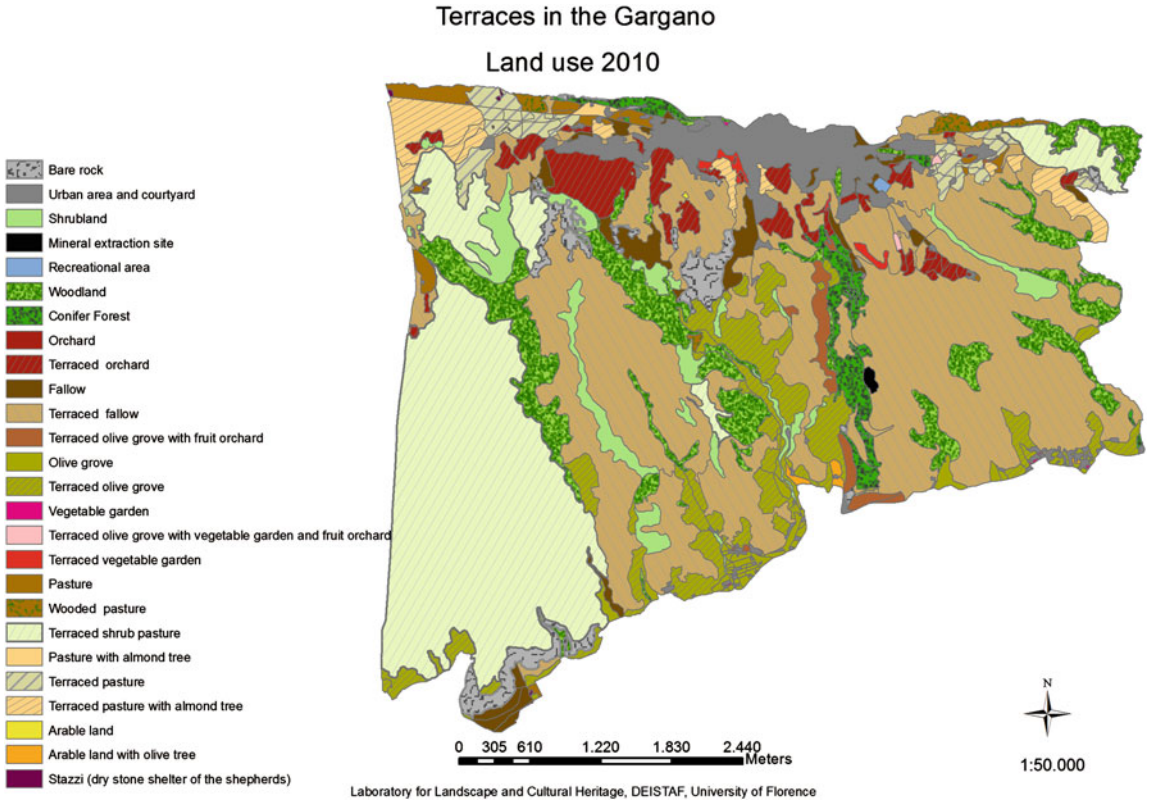

Fig. 22.7 The terraced slopes of Gargano are only marginally used for traditional agricultural cultivation of olive trees, almond trees and small vegetable gardens, which together make up 11 % of the area. Most of them are used for pasture (27.4 %), or are abandoned (35.3 %). Overall, the historical landscape is intact, not for the present land use, but rather for the widespread presence of terraces preserving the most important feature of the area. This observation is important not only for the assessment of integrity and vulnerability, but also for the way the subsidies of the European Common Agricultural Policies (CAP) are used. Some local administrator has proposed to afforest these slopes, since they have little economic importance, using the subsidies offered by the CAP. This would obviously further degrade the value of this historical landscape

germoplasm) that used to characterize the agriculture of southern Gargano. The trees are often very old and near extinction. The dry-stone retaining walls of the terraces are made of rocks cleared out of the plots. The same rocks are used for the dry-stone masonry of the *pagliari*, rural shelters resembling *trulli*, some of which still survive. There are also some small masonry constructions.

The terraces on the middle-low slopes (Mattinata, Macchia di Monte Sant'Angelo), where olive is grown in association with almond, are still intact, even in their agronomic functionality, clearly because they still yield some income. On the contrary, the terraces on the upper slopes (to the west of Monte Sant'Angelo), once used for arables, today are prevalently in a state of abandon. They are hence exposed to renaturalization processes, which nevertheless will not avert erosion due to abandon.

As regards vulnerability, the principal threat to the integrity of the terraces is failure to maintain earth retaining works as a consequence of the abandonment of the countryside and the lack of a generational turnover. The ecological consequences of abandon—erosion and widespread rockiness—have been evident for quite some time now. The olive-bearing terraces, although they are still being cultivated to a small extent, do not guarantee returns proportional to the work—mainly manual—they require. Terrace maintenance is an especially arduous task that cannot be ensured simply by local farming businesses, even with the benefits of conditionality. In the past, the Gargano Park financed partial terrace maintenance actions, but this does not seem to be a priority in its policy (Figs. 22.6, 22.7).

22.7 The Itria Valley (40° 40′ 54″ N; 17° 22′ 03″ E)

The Valle d'Itria is one of the best known landscapes in Puglia, thanks to its characteristic *trulli*. The selected area extends over about 600 ha. It lies in Paretone, within the municipality of Martina Franca in the province of Taranto. The area is included among UNESCO World Heritage Sites under the denomination "Trulli di Alberobello". It lies within the Eastern Murgie Natural Reserve and the Southeast Murgia SCI, besides being under restrictions as per landscape law 1497/39. The land is privately owned and altitudes range between 380 and 420 m a.s.l. Martina Franca can be reached from Taranto, 25 km away, by SS 172, or from the A14 by SS 172 dir. Paretone can be reached from Martina Franca by driving southeast on the SS 581. The geological substratum is constituted by Altamura Limestone, that is ceroid and detrital stratified limestone with varying textures. Karstic phenomena are also frequent. Almost all over the Itria Valley and in the many karstic depressions in the area, one observes deposits of *terre rosse* (red earth), composed of fertile calcareous residues. This earth is especially suited for arboreal and shrub cultivations, especially of vine. Sedimentary "red earth" (*terre rosse*) and, more rarely, "brown earth" (*terre brune*) covers are deposits of alluvial origin that have shaped the area, giving rise to an alternation of rises and hollows, with an average local relief of not more than 50 m. In absence of any sizable surface streams, meteoric water runs in rivulets or in artificial troughs called *lame*.

The most significant historical features of the Valle d'Itria's landscape, whether rural or not, and human occupation was, at least as late as the 1950s or 1960s, the fact that a significant part of the total population lived in scattered houses, and the abundance of vineyards. These occupy small, sometimes tiny plots, delimited by dry-stone walls (*pareti*). Each plot almost invariably has a *trullo*, that is, a traditional building of calcareous stone with a square plan and usually several rooms, where peasant families lived for most or all of the year. The often very thin limestone layers of the geological substratum provide suitable stone (*chiancaredde*) for the roofs of *trulli*, as well as the eaves of the roofs of *a pignon* buildings. The latter are larger and rectangular in plan, and are widespread in the historical centers of towns in the area, or used as service buildings next to farmhouses (*masserie*) in the "Murgia of trulli and caves". The Valle d'Itria almost certainly derives its name from the popularity in this area, as well as the rest of Salento, of the cult of the Madonna of the Odegitria, a protector of travelers. The cult was spread by Basilian monks who sought shelter in south-central Puglia between the eighth and the ninth century. For many centuries, ecclesiastic institutions have owned vast estates in the area. As early as the late Middle Ages and the early Modern age, this favored the rise of a diffuse and relatively stable small or middle-sized peasant possession. Long-term emphyteutic contracts encouraged the planting of tree orchards and shrub crops, especially vineyards. The century that followed the Unity of Italy witnessed the maximum spread of vineyards in the three municipalities comprising the Valle d'Itria, up to 55–60 %, as well as the highest degree of dispersion of the peasant population in the countryside; although some more or less vast surfaces managed by farmhouses were set aside for grain and grazing, and there were ample wooded areas. *Casedde* and vineyards remained a dominant combination at least until the 1950s or 1960s. The importance of the system, however, rapidly declined in the following decades as a result of the crisis of smallholdings, swept away by mass emigration, the growing importance of manufacturing and crafts, even among countryside dwellers, and mass motorization. The most evident manifestations of this process have been, especially since the 1970s, a drastic reduction of the wine-growing surface, the deterioration and often the abandonment of *trulli*, poor maintenance, or lack thereof, of dry-stone walls, often replaced by less expensive but frankly repellent concrete ones, sometimes faced with irregular limestone slabs. In the traditional vineyards, *verdeca* and *bianco Alessano* grapes are grown in low rows in hollows used to keep rainwater from draining away along more or less steep slopes. The rows, however, have been partially replaced by *tendoni* for the production of table grapes.

The Val d'Itria landscape owes its integrity to the preservation, in some of its areas, of the traditional equilibrium between different soil uses, of the *trulli*, and of high property fragmentation. Wit the growth of high-quality specialized wine-growing, new vineyards are being planted and others are being reconverted. Farms are being reorganized and the farmhouses renovated. Marginal grain growing has also resumed with the artificial support of European Community income integration procedures. With the regulation of systems for the production and commercialization of local agricultural products that is presently underway, it is possible that new productive activities will be set up to restore, even if only in part, the historical landscape and crops of the area, although employing new methods and in a changed context.

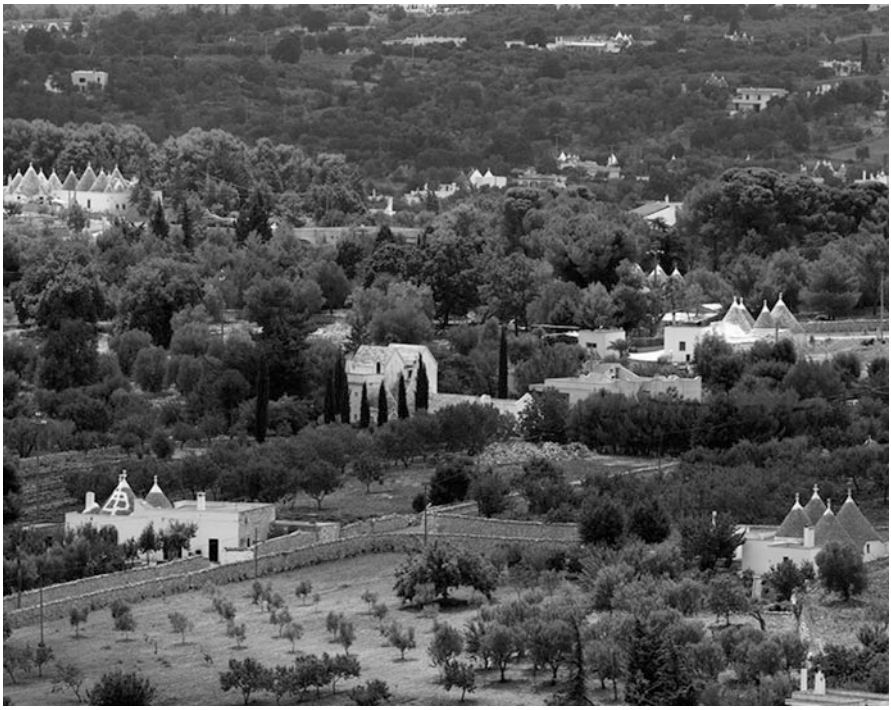

Fig. 22.8 In the Itria valley, *trulli*, dry stone walls and small scale cultivations merge, forming a unique landscape

The most substantial threats to the landscape of the Valle d'Itria come, on the one hand, from the abandonment of some vineyards and fruit orchards as a consequence of low generational turnover among farmers; on the other, from the fact that the valley's distinctive traditional buildings are not always being adequately protected. While until the 1980s many *trulli* were abandoned, later their owners preferred to destine them to seasonal use by residents or tourists. This has given rise to a profitable market, leading to renovations that show little respect for the architectural and landscape characteristics of the area. Some historical stone constructions (*trulli*, *lamie*, dry-stone walls) are still being abandoned today. Besides, the increasing expansion of residential and industrial areas definitely poses yet another threat to the landscape of the Itria valley (Fig. 22.8).

22.8 The Vineyards of the Lecce Tavoliere (40° 22′ 59″ N; 17° 56′ 34″ E)

The wine-growing area examined here extends over about 930 ha on the west-central versant of the Tavoliere di Lecce (or "Piana Messapica"), in the municipality of Salice Salentino. The altitude is constant, around 45 m.s.l. The cultivated areas are privately

owned. Salice Salentino can be reached from Lecce, about 18 km away, by SS 7ter, direction northwest. The vineyards extend west of the town. The Lecce Tavoliere is characterized by a vast surface of Mediterranean brown earth, leached soils and lithosoils, very fertile and deep, and well-suited to intensive agriculture. These soils, interrupted near Lecce by massive layers of red earth, are crossed by shallow and short streams. Because of the levelness of the ground, large malaria-infested swamps used to frequently form here.

The area's landscape is especially significant. Human activity has put a strong stamp on it. Over the centuries, local populations transformed what was originally a harsh environment, with stagnant waters and rocky terrain. The most salient feature, even today, of the west-central part of the Tavoliere is viticulture, one of the most modern and innovative sectors of the farming economy of Salento, usually carried out on small plots, as it traditionally was. The "agricultural revolution" in Salento, with the large-scale planting of vineyards, occurred after the collapse of grain prices and the "great depression" of the 1870s. In a short time, "a sea of vineyards", as a coeval writer put it, submerged thousands and thousands of hectares in reclaimed maqis and marshes in the provinces of Brindisi and Taranto, in the harsh rocky land in the west part of the province of Lecce, and on the Ionic versant of Capo di Leuca. The effects of the spread of viticulture over vast areas were very significant. Latifundia were parceled out, peasants improved their social status, and malaria-infested and rocky areas were reclaimed for agriculture. Still, these effects were conjunctural, being dependent on the oscillations of the international market the local wine and must was produced for. Recurring and devastating crises in the sector spurred innovation in productive processes and a higher attention to the demands of the market to secure a stable and long-lasting position in it, thanks to excellent quality and competitive products. The luxuriant vineyards play an important role in the economy of the many towns in the area, which are populous and lie at great distances from one another. In this area of the Piana Messapica, single-story farmhouses and shelters built of dry-stone, or dry-stone and wood are significant landmarks. In all the Piana Messapica, the "sea-of-vineyards" historical landscape presently extends over a total surface of 15,078 ha, mainly producing wine grapes, out of a total agricultural surface of 52,090 ha. The viticultural landscape thus accounts for 28.9 % of the total cultivated surface. This apparently low percentage belies the importance of vineyards, which are the dominant feature of the agricultural landscape, even in communes such as Salice Salentino or nearby Guagnano, where olive orchards are also grown, although their importance is secondary, The most widespread variety of grapevine in the area is the *negro amaro*, which combined with black *malvasia* yields excellent red and rosé wines.

The area still has a high degree of landscape integrity. It retains original features going back to the viticultural transformation that impacted a much vaster part of Salento. Today, a process of specialization, partially achieved by planting selected vines with COD certification; EC incentives for vineyard removal; and restrictions on the planting of new vineyards have favored a reduction of vineyard surface in the Salento part of the Tavoliere; they have, however, also stimulated the growth of high-quality winemaking and a strong characterization of the rural landscape.

Fig. 22.9 Tree vines in the landscape of the Lecce Tavoliere

Some elements of vulnerability are also observable. Threats to the historical-cultural features of the local landscape are mainly the result of the strong trend towards high-quality industrial viticulture. There have been radical changes in vineyard layout and average plot sizes. Training on espaliers or walls is replacing traditional systems, and a reduced-cycle rotation has been introduced. The grape harvest is now highly mechanized, and the associated growing of other plants is increasingly rare, as are traditional structures such as wells and low walls (Fig. 22.9).

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Chapter 23
Calabria

Giuseppe Barbera

23.1 Introduction

Dominated by a harsh and craggy orography, with mountains and hills extending over 90 % of its territory, over the centuries Calabria—ancient Roman Brutium—has developed a considerable variety of landscapes marked by the presence of agricultural areas (37 %), woods (40.6 %) and pastures (9.2 %). Possibly the earliest of these, which even today still seems to evoke the beginnings of agriculture and husbandry, is that connected with the typical latifundium. This agricultural system is the result of the adaptation of primary productive activities to specific environmental conditions

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that long prevailed in many plains and low hills of south-central Italy. In this usually clay-rich land, scarcely populated and with a rather arid climate, for centuries cereal cultivation (of wheat, barley and rye) alternated with fields and pastures where flocks came down to winter from the Apennine highlands. As an example of this type of landscape—whose bleakness even today still retains a solemn and lunar quality in the plateaus and hills around Crotone—we describe here the agricultural landscape of Isola Capo Rizzuto, in the province of Crotone. This area was once functionally connected with the Sila plateau, where the flocks migrated in the summer in search of fresh pastures and water. As examples of such pastures we describe here the *campi ad erba* (grass fields) of Camigliatello, typical of a silvo-pastoral system that is widespread in the Sila plateau, but is declining rapidly today as pastures are abandoned.

But Calabria is also a land of trees, which are found both in forests and in cultivations. The Sila forest boasts imposing larch pines exploited ever since the ancient Roman age in shipbuilding and for the production of pitch, as well as loricate pines and beeches. It is still dotted with pastures that were once the destination of transhumant flocks. It is a woodland defined as "inaccessible", whose exploitation for shipbuilding was fraught with difficulties due to an almost total lack of roads. Peculiar formations, such as beech specimens modeled by cattle bites, are still visible today and are unique features of the silvo-pastoral landscape of the Calabrian mountain. As regards farming over the last 50 years, modern arboriculture, notably of citrus and specialized fruit trees, has expanded in the reclaimed plains of Sibari, Lamezia, the Neto Valley (in the province of Crotone), and in the plains of Gioia and Rosarno. The terminal valleys of torrents, thanks to reclaiming by means of landfills, are now full of trees, especially citrus. Olive trees, once mingled with fruit trees and vineyards, or randomly scattered along the slopes of most highlands, are now grown in smaller sizes and arranged according to the geometries of industrial cultivation both in the hills and in the plains.

Certainly in Calabria, as elsewhere in Italy, many traditional rural landscapes have disappeared; especially peasant polyculture and terraced slopes. Also, the area's extraordinary biodiversity has been reduced. But it is concrete rather than the expansion of specialized cultivations that inflicts the most serious wounds on the landscape. Fragments of agricultural landscapes, not necessarily peasant, often incorporating spectacular aesthetic values, are being defaced by buildings whose sense eludes us. Calabria still boast an historical heirloom of the traditional olive-tree landscapes that is undoubtedly one of the most unique in the whole Mediterranean basin: the Olive Orchards of the Gioia Tauro plain—Calabria's *terra dell'olio* par excellence—which extends for about 1,400 ha between Cittanova and Rosarno. Here one is confronted with a sea of trees composed of over 2,000,000 specimens. Imposing trees, some over 20 m in height, and cultivated so densely as to form a true forest. A majestic landscape, which as early as the nineteenth century amazed quite a few travelers passing through these lands. The Bergamot Landscape is very interesting, and unique in the world. This ancient cultivation connected to the perfume industry is represented by a surviving testimony at Brancaleone, in the province of Reggio Calabria. We exemplify a characteristic feature of the Calabrian woodland landscape, that of

chestnut groves—for centuries a source of food for mountain populations—with a site in the province of Catanzaro, now included in the Reventino Park. After many years of neglect, there is now among local farmers a revival of interest in Calabria's groves of chestnut trees, interspersed with oaks and other species. In a sometimes impervious high hill and mountain habitat between the villages of Serrastretta and Cicala, chestnut trees have restored the economic utility of slope land and protect it from erosion. The presence of many monumental specimens grants further aesthetic value to this heritage, which we must also preserve from clumsy management operations in which trees that are too old are sometimes cut down because they are not sufficiently productive.

23.2 Sila Plateaus (39° 18′ 15.23″ N; 16° 25′ 31.33″ E)

This is a silvopastoral landscape extending over about 1,000 ha, constituted of woods interspersed with *campi ad erba* (grassy fields). Transhumance has been practiced for centuries in its mostly privately owned level areas. The area lies within the municipalities of Spezzano della Sila, Spezzano Piccolo e Serra Pedace, in the province of Cosenza, within the Sila National Park and it is also protected according to the landscape law n. 431 of 1985. It can be reached from Crotone by the SS 107 state road or from the Salerno-Reggio Calabria A3 Highway, exit Cosenza Nord. It lies east of the Calabrian-Lucanian Apennine, in the middle of the Sila mountain range. This has a remarkable extension, with broad plateaus between 1,000 and 1,300 m a.s.l., dominated by peaks such as Botte Donato (1,929 m a.s.l.), Montenero (1,881 m a.s.l.), and Volpintesta (1,730 m a.s.l.). The geological structure is composed of crystalline rocks dating back to the Upper Paleozoic, with phyllites, gneiss, and granatiferous schist containing garnet crystals and mica flakes. The prevalent altitude is 1,200–1,600 m a.s.l., with a minimum of 534 m a.s.l. and a maximum of 1,929 m a.s.l.

The area derives its significance from the historical importance of the Sila range, already described by Roman authors as an area of extensive woods with imposing trees. With progressive colonization and deforestation, often employing fire, these gradually gave way to pastures, giving rise to a silvopastoral system characterized by transhumance that lived on for centuries. The most widespread breed of bovine is the Podolica, a direct descendant of the aurochs, from whose milk the POD-branded Caciocavallo Silano cheese is produced today. The landscape has been shaped by the typical ownership and production relations of the latifundium: a vast estate, larger than 500 ha, and a host of "landless" farmers owning a mere 2.2 % of the overall surface, in holdings of less than 2 ha. In an area with a density of barely 47 inhabitants per km^2, plot owners made up a labor reserve for seasonal phases when the demand for work grew (sowing, weeding, harvest). Production was based on a 6-year rotation: bare or green fallow, wheat, stubble field, and a resting period of three pasture years. In the stubble field year, the plots were rented out under the *terraggeria* regime (annual rent paid in kind) to bind the landless farmers to the land. A comparison of the data of the Land Registry of 1929 with those of the Agriculture Census of 2001

Fig. 23.1 The silvopastoral landscape of the Sila has been shaped by the typical ownership and production relations of the latifundium

Land use 2007	Surface (ha)	Surface (%)
Urban area and courtyard	0.10	0.011
Shrubland	2.49	0.30
Beech forest	698.00	73.00
Pine forest	5.72	1.00
Fallow	4.23	0.40
Pasture	115.78	12.00
Wooded pasture	111.73	11.66
Shrub pasture	20.28	2.00
Total	*958.34*	*100.00*

Evaluating indices of landscape	
Number of land uses	8
Number of patches	123
Total surface area (ha)	958.34
Average surface area of patches (ha)	7.79
Average surface of forest patches (ha)	44.14
Average surface area of pasture patches (ha)	2.92
Hill's diversity number	2.43
Class of landscape integrity (I–VI)	VI

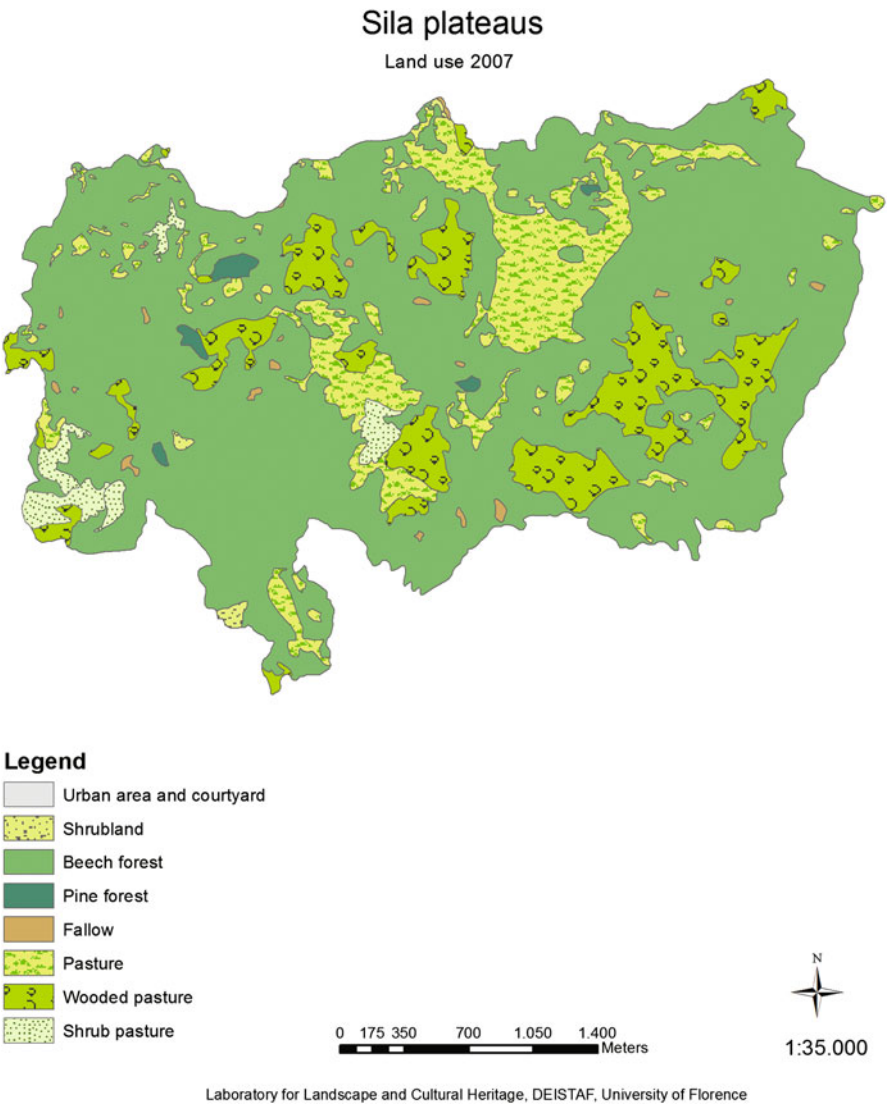

Fig. 23.2 The Sila plateau is a silvopastoral system characterized by the presence of grazed and wooded areas, with different degrees of density, already described by Roman authors. The landscape shows large wooded areas (74 %), pastures (12 %) and wooded pastures (11.6 %). Overall, there is a clear persistence of the historical land uses and therefore an almost absolute level of integrity. The major threats are presented by the abandonment of pastures, favoring the extension of woodlands and the current forest policies that do not favor grazing

indicates an increase of woodland in both absolute and percentage terms, while grass fields diminished in absolute terms (7,000 ha including arable land and pastures), but remained widespread. Tree species include beech (*Fagus sylvatica*), larch pine (*Pinus nigra calabrica*), loricate pine (*Pinus leucodermis*). Shrubs include hemispheric

juniper (*Juniperus hemisphaerica*) and herbaceous plants, some unique to Calabria such as *Alchemella australica*, *Soldanella calabrella* and *Lereschia thomasii*. The presence of beech (*faggio*) inspired the toponym "Fago del Soldato" for a spot at the highest point of the SS 107 state road. A typical landscape feature connected to grazing is the peculiar shrub forms assumed by some beech trees as a result of being shaped by cattle bites. And we should not forget the larch pine, once used both in shipbuilding and to produce pitch.

The area shows a good degree of integrity. The centuries-old practice of grazing and a low anthropic pressure have allowed this landscape to come down to us retaining very similar features to those described in accounts of the past centuries. One of the principal of these surviving features is the alternation of pastures and wooded areas, individual or in groups. Another fundamental element of stability is land sharing through renting and *terraggeria*, with continuous pasturing allowing the permanence of open spaces.

As regards vulnerability, over the last 50 years diminished anthropic pressure, a result of the migratory flows of the 1960s and 1970s, has made its effects felt. The consequent expansion of woodland and concomitant shrinking of arable land and fields as they are progressively abandoned tend to reduce pastures, a trend that is strong today all over the Italian mountains. This process has a negative side-effect on landscape diversity, which is giving way to compact and homogeneous woodland, with a consequence reduction of biodiversity as regards species that thrive in non-wooded habitats. At the same time, one remarks a considerable increase in animal species, both avian (buzzard, sparrow hawk, black woodpecker) and mammal (wolf, wildcat, otter, and marten), a symptom of gradual renaturalization and a decrease in importance of the cultural landscape and its biodiversity. Another cause of vulnerability is tourist flows to the Moccone ski station and unregulated summer tourism (Figs. 23.1, 23.2).

23.3 The Grass Fields of Isola Capo Rizzuto (38° 56′ 06.38″ N, 17° 00′ 54.48″ E)

The landscape of this area, which extends over about 750 ha, is dominated by typical *campi ad erba* (grass fields), mostly privately owned. It lies within the commune of Isola Capo Rizzuto. It can be reached from the SS 106 Ionica state road, direction Isola Capo Rizzuto. The area is characterized by a prevalence of impermeable soil and a geomorphological structure mainly consisting of pre-Paleozoic and Paleozoic formations (mica schist, granatiferous gneiss, and granite) with occurrence of phyllades, schist, and white mica schist. Pliocene clays form gullies (*calanchi*), and alluvial sands are found from the Cutro hills to the valleys of the Neto and the Tacina. The gradient is especially gentle, with a minimum altitude of 0 m a.s.l. (Crotone, Isola Capo Rizzuto, Strongoli).

The area owes its significance to the role of grass fields in the Calabrian landscape and their historical persistence. Their origins can be traced back to before Greek colonization. Human settlements are attested here throughout the Neolithic period, the Bronze Age and the Iron Age. Human habitation was facilitated by the

area's favorable geographical position, mild climate, and an environment that was especially propitious to survival. In the eighth century B.C. the Greeks established themselves here, founding several colonies. A place known as "Le Castella", where a splendid Aragonese castle stands today, in Roman times was a *castra Hannibalis*, as Pliny relates in his *Naturalis Historia* (IX, 3). Its name "Isola" should not be confused with the identical Italian word for "island": it is probably derived, instead, from the term *asylos* (protection, shelter), as this site was called. The first mention of the town of Isola is found in a ninth-century list of bishoprics adhering to the Greek ritual placed under the authority of Constantinople. As early as the papacy of Leo VI (886–912), we find it mentioned under the name Aisylorum as one of the four local suffragan bishoprics (suppressed in 1818) depending from the Siberene (Santa Severina) Metropolitan. With the rise of the latifundium system (1861–1951), the landscape acquired an identity and an integrity that have remained unaltered until the present day. The latifundium system was established following the abolition of the Ecclesiastical Axis (1784–1815) and the application of laws against feudalism (*Leggi eversive della feudalità*, 1804–1806), which allowed colossal land accumulation whereby three landowners—Barracco, Berlingeri and Gallucci—came to own over 15,000 ha of land each. This accumulation system resulted in a dramatic gap between landowners with estates larger than 1,000 ha and a host of landless farm laborers and smallholders. Part of the land was directly farmed by its owners, while another was given over to *industrianti*, called thus because they were mainly involved in the livestock industry. A turning point in the production system was the Protectionist Law on Wheat of 1887 and the Battle of Wheat. The local agricultural system was based on a 6-year cycle: bare or green fallow, wheat, stubble field, and a resting period of three pasture years. This system had several purposes: restoring fertility by allowing land to rest, taking advantage of fallow periods to weed the fields, being present on the market with several different products (grain, milk, cheese, wool, meat), and controlling the labor supply by giving out *terrageria* (annual rent paid in kind) contracts for the stubble field period. As Snowden (2006) illustrates, the system was suitable for the typical organization of work in an area plagued by endemic malaria. For a similar latifundium-malaria connection, see Lazio (1), where the disease reduced population density to $<30/km^2$ and average life expectancy to not more than 30 years.

In spite of deep social changes, the landscape has maintained its integrity. Historical continuity is observable in the property boundary system and in the still deserted vast inland areas between the plains and the mountains, originally left unsettled as a protection against raiding. This landscape "system" is still observable from the SS 107 state road leading into the Sila. There are no human settlements between S. Severina and Caccuri, nor along the inland route from Roccabernarda to the Cotronei area, where the tuff caves where the ancient Bruttii made their homes are still intact and visible. Boundaries between properties, when they are not natural (ditches, rivers, ravines), are marked by a meter-wide strip covered with *scinari*, i.e., hedges of spontaneous shrubs with a prevalence of evergreen pistaches (called *scinu* in the Calabrian dialect), which allowed grazing livestock to roam freely after the wheat harvest. Other latifundium areas had similar boundary systems.

Fig. 23.3 The grass fields of Isola Capo Rizzuto

As regards vulnerability, this landscape appears threatened both by natural and anthropic factors. The latter include intensive cultivations, wind turbines, and especially uncontrolled building, to protect the area from which the marine park of Le Castella was established. The main natural risk factor, instead, is the widespread presence of blue clays that are resistant to plant colonization (Fig. 23.3).

23.4 Reventino Chestnut Groves (39° 00′ 49.01″ N; 16° 27′ 13.63″ E)

This is a wooded area with a prevalence of chestnut groves extending over about 1,000 ha within the municipalities of Cicala, Serrastretta, Gimigliano, San Pietro Apostolo. It is mostly under private ownership and lies within the Reventino Park. From the village of Cicala, one drives along the old SS 18 state road, turns at the intersection direction Tiriolo, and then again at the following intersection of S. Pietro Apostolo. From Serrastretta, one takes the SS 18 and turns for Tiriolo at the intersection, then drives in direction Soveria Mannelli. The area mostly lies at an altitude between 600 and 950 m a.s.l., with dramatic changes in elevation; within a short space one goes from a minimum of 390 m a.s.l. (Cicala) to 1,000 m a.s.l. (Serrastretta). The Reventino range is an integral part of the Sila massif. The crystalline granitic rock of the south-central Apennine is visible in the calcareous Dolomitic

cliffs in the northern part of Calabria. There is a prevalence of Pre-Paleozoic and Paleozoic crystalline formations. Mesozoic formations are rare. Along some of the slopes of the area one finds "Gimigliano Green Stone", a serpentinite that was used to grace many churches and mansions in the area.

The area owes its significance to the historical importance of the cultivation of chestnut tree, one of the forest species with the highest cultural importance in the Italian rural landscape. The area gained importance with the advent of the Bruttii people in the fourth century B.C., after they detached themselves from the Lucani. Unlike other peoples, the several groups in which the Bruttii had separated united, forming a confederation at the site of the present-day town of Cosenza, which derives its name (originally Consentia) from this pact. The village of Serrastretta was founded in 1383. Cicala, founded in 1595, is known for its specialization in the working and trading of chestnuts and marrons, which it also exported to Europe and North America. The chestnuts of Calabria are recognized as Traditional Food Products by the Ministry of Agricultural Alimentary and Forest Politics. The Bruttii extended their dominion to the whole mountain area, including the Sila and Reventino Mancuso. Several Grand Tour travelers mention the old road that went up from Nicastro to Mount Reventino. Sometime between 1783 and 1785, the British writer Henry Swimburne mentions going up the mountain and entering a forest composed of oak closer to the plain and of chestnut trees further up. The slopes descending from Mount Reventino to the areas of Conflenti and Decollatura are steep and uniform. Today they have been reforested with coniferous species, chestnut trees, and Turkish oaks. The most conspicuous spur, at the watershed between the Conca di San Mazzeo hollow and the Piazza river valley, is wooded but with exceptional panoramic points offering a view of both seas and the opposite bays of Sant'Eufemia and Squillace. Along the whole ridge of the range, larch pine reforested areas alternate with beech and alder, Turkish oak groves, and chestnut groves. A characteristic local landscape feature are large and small rocks projecting from the slopes of mountains, commonly known as *pietre* or *timpe*. There are many scattered farmhouses, some still operative, others in ruins, as well as old rural buildings made with an intriguing building technique employing small flakes of stone (mostly schist) bound with mortar. Over the years, many of these have been transformed with plaster and reinforced concrete. Over the whole area one finds gigantic specimens of both chestnut and Turkish oak. At Serrastretta there is a monumental nettle tree (*Celtis australis*). The whole area has high biodiversity.

The integrity of this landscape has been compromised by reforestation with non-autochthonous species, and partly abandoned and partly coppiced chestnut groves. The emigration of about 65 % of the population in the 1960s resulted in a drop in chestnut production, which has recovered, however, in the last decade. The phytosanitary condition of the chestnut groves today appears to be good, thanks to the curing of cortical cancer by spreading hypovirulent strands produced by coppices. The human settling of the two valleys led to the forming of mule tracks descending to the bottom of valleys and back up on the opposite side, also employing wooded bridges, today largely destroyed or replaced with masonry ones. Between Monte Tombarino and Monte Capo Bove are the remains of an ancient mule track that went across the ridge. The path, dug into the soil by erosion, is hemmed in by dry-stone walls, but is now submerged by vegetation that makes it impracticable.

Fig. 23.4 The management of chestnut orchards also required small buildings where the chestnuts were stored and dried

This landscape system has many vulnerability factors. There is the phenomenon of abandonment and the gradual conversion of pure chestnut groves into mixed woods. Forest improvement actions often involve the felling of gigantic specimens. From a sanitary point of view, there is the risk of a resurgence of the ink disease, which has already been reported in other adjacent chestnut woods, and the setting in of new virulent strains of cortical cancer. Inadequate management of soil protection structures is another risk factor that should not be underestimated (Fig. 23.4).

23.5 The Costa Viola (38° 18′ 34″ N; 15° 49′ 43″ E)

Maurizio Gangemi

This terraced landscape extending along the Tyrrhenian coast of southern Calabria, between Capo Barbi and Cannitello, comprises several non-contiguous areas with a total surface of ca. 800 ha—of which ca. 300 are still cultivated—within the municipalities of Palmi, Seminara, Bagnara, Scilla and Villa S. Giovanni, in the province of Reggio Calabria. The land is mostly privately owned, with altitudes between 0 and 500 m a.s.l. This landscape is almost entirely included in the "Costa Viola" SPA, as well as the "Costa Viola e Monte S. Elia" SCI. It is also under landscape

restrictions according to above Law 1497/39. The area can be reached from the A3 motorway by the Palmi, S. Elia, Bagnara or Santa Trada exits. Wonderful views can be enjoyed as one drives along the coast towards Reggio Calabria on SS 18, an old road dating back to Bourbon times, towards Reggio Calabria. All the towns in the area are served by the Tyrrhenian railroad line, except for Seminara with its short and beautiful beach, Cala Janculla, which can only be reached from the sea.

The area's geological substratum prevalently consists of amphibolic schist and mica schist with veins of pegmatite and jalomicte, whereas the innermost zones have a substratum of clayish sands of reddish color and conglomerates of crystalline pebbles in a clay-sand cement. The foothills of the Aspromonte extend out into the Tyrrhenian sea, giving rise to a variety of natural scenarios: rocky cliffs dropping precipitously into the sea alternate with gentler declivities, deep gorges where torrents run, small beaches, short promontories, caves and inlets. The whole coast looks out onto a matchless panorama extending from the Straits of Messina to Milazzo, and from the Golfo di Gioia to Capo Vaticano, with the Aeolian islands closing off the horizon.

The area owes its significance to the historical persistence of a hilly landscape shaped by man over centuries to allow the cultivation of olives, citrus fruits, mulberries, figs, vegetables and, above all, grapevines. The terraces alternate with small woods and open pastures. We do not know how far back the local terracing system dates, but it expanded between the late Middle Age and early 20th century. The terraces, known as *rasule*, are supported by dry-stone walls (*armacie*). Especially in the area between Bagnara and Scilla, they have gradually reached the highest slopes, competing with the chestnut coppice woods that have always provided wood for wine barrels and supporting poles for the grapevines. The traditional vineyards are of the shrub or pergola types, although today the espalier system is also used. A variety of wines are produced here, including Castiglione, Lacrima, Malvasia, Nerello, Nucera, Prunesta, "Ruggia", "Zolea", and Zibibbo. The terracing of the sometimes very declivitous slopes resulted in the "welcome spectacle" of dense vineyards climbing steep mountains observed by Galanti at the end of the 1700s, the same scenery that elicited the admiration and wonder of the compilers of the "Atti della Giunta per la Inchiesta Agraria" (Agrarian Investigation) a century later. As late as the 1960s, Lucio Gambi counted all of "220 rows on a versant with an inclination exceeding 30°" in the vicinity of Bagnara. The *rasule* extend for several thousand linear kilometres. Their depths range from barely a metre in some points to more than ten in others. They are supported by dry-stone walls approximately 0.5 m thick and up to 3 m high. Small stone staircases connect terraces at different levels. The small and middle-sized rocks are locally extracted. The walls are skilfully built by the farmers themselves or, more frequently, by specialized masons, ensuring drainage as well as the stability of the terrace.

The Costa Viola landscape still retains a fair degree of integrity, although the total surface still habitually cultivated has decreased considerably since the early 1900s. Part of the merit for the conservation of the historical terraces rests with recently formed cooperatives of wine-growers and a few businesses that have managed to revive wine production, partially by introducing new grape varieties (Chardonnay, Cabernet, Sangiovese and Sauvignon) and modern transportation systems such as

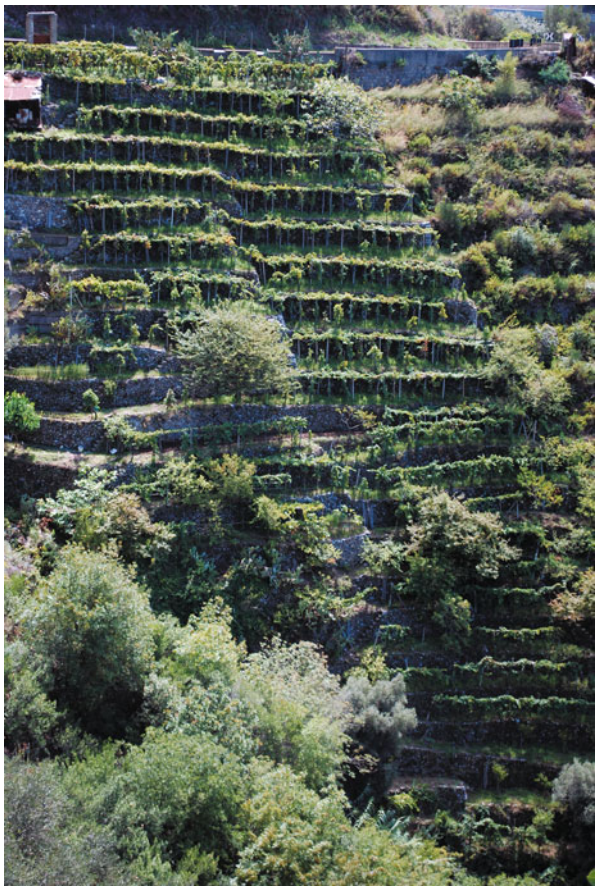

Fig. 23.5 The landscape of the Costa Viola has been shaped by human beings over the centuries

monorails. Thanks to these efforts some of the local wines have earned IGT designations. Some local, national and EC institutions have adopted initiatives to safeguard and promote the area, which aspires to Unesco recognition as "World Heritage" for its valuable landscape.

The vulnerability of the area is mainly a consequence of abandonment. The local wine-growing system, until recently, remained static and unchanged and the steep slopes hinder mechanization. The agricultural population is aging and/or migrating away from the area. The cost of labour has increased, property fragmentation is high, and the terraced cultivations are very hard to access and manage. All this has led to gradual abandonment. Many plots are left uncultivated even by families of farmers who are still tenaciously striving to produce for self consumption. Part of the abandoned terraced landscape is still clearly distinguishable, although increasingly overrun by spontaneous vegetation. Elsewhere, however, vast stretches of this immense human effort have disappeared. The interruption of regular maintenance of the terraces, walls and drains, especially after traumatic events such as floods and earthquakes—not infrequent in the area—is increasing erosion and hence

hydrogeological risk. This essentially fragile area is further threatened by recent works to improve the A3 motorway, as well as free-roaming grazing and unauthorized building (Fig. 23.5).

23.6 Monumental Olive Trees at Gioia Tauro (38° 23′ 27.75″ N; 15° 56′ 17.95″ E)

This monumental olive tree area extends over about 1,400 ha in the Municipalities of Gioia Tauro, Rizziconi, Taurianova, and is quite intact. It lies within a mostly privately owned district extending eastward to Cittanova and northward to Rosarno. It can be reached by the A3 Salerno-Reggio Calabria highway, direction south, exit Gioia Tauro, 0.5 km from the town.

The area owes its significance to the monumental character and extension of its olive orchards, as well as their prominence in the landscape. The river Metauro played an important role in the history of the plain of Gioia Tauro. A port established at its mouth favored the rise of the settlement of Metauros, a Chalcidean colony, in the seventh century B.C. Olive-tree growing appears to have been already well established by the Roman period as an element of the villa system of agriculture, and continued in the following centuries. In the seventeenth century it apparently was the only constantly expanding economic activity in the area. Pruning was an unknown practice, which accounts for the monumental size of the trees. The ground under newly implanted orchards was seeded for some years and the straw left over after the harvest was burned. Along the coasts of the Tyrrhenian sea, until the seventeenth century olive trees were grown on hill slopes, while level areas were set aside for wheat, vineyards, vegetables and fruit orchards. During the eighteenth century some events occurred that were destined to transform the agrarian landscape of the Piana: notably, the disappearance of the mulberry tree and the silk industry; an increase in oil consumption for public illumination, the textile industry, and the food needs of the urban population; and a decrease of taxes on oil. Innovations in extractive technologies contributed to an extraordinary growth of the oil business. From the early nineteenth century onward the Piana di Gioia Tauro was deeply transformed. The process had actually already begun after the middle of the 1700s with the introduction of Genoese-style oil presses, reported by Grimaldi (1777). Olive orchards thus began to be established in the plain as well. By the end of the century, even centers which had always specialized in wheat production were shifting to olive growing. The olive orchards of the Piana di Gioia are certainly one of the most remarkable and elaborate examples of an extensive arboreal monoculture. The area is defined by Medici (1961) as a "peasant latifundium". The orchards are usually monocultural and homogeneously laid out, with a tree spacing of 15 by 15. Only along the margins of orchards do the olive trees—some of which are taller than 20 m—mingle with citrus. Three varieties are present: *Ciciarello* (a pollinator), *Sinopolese*, and *Ottobratica* or *Perciasacchi*, which dominates the lower part of the area. Due to their size and asynchronous ripening, the trees produce a lampante olive-oil, recognized as a Traditional Food Product by the Ministry of Agricultural Alimentary and Forest Politics, with the name of *Olio di Calabria*. The area is rich in surface water that

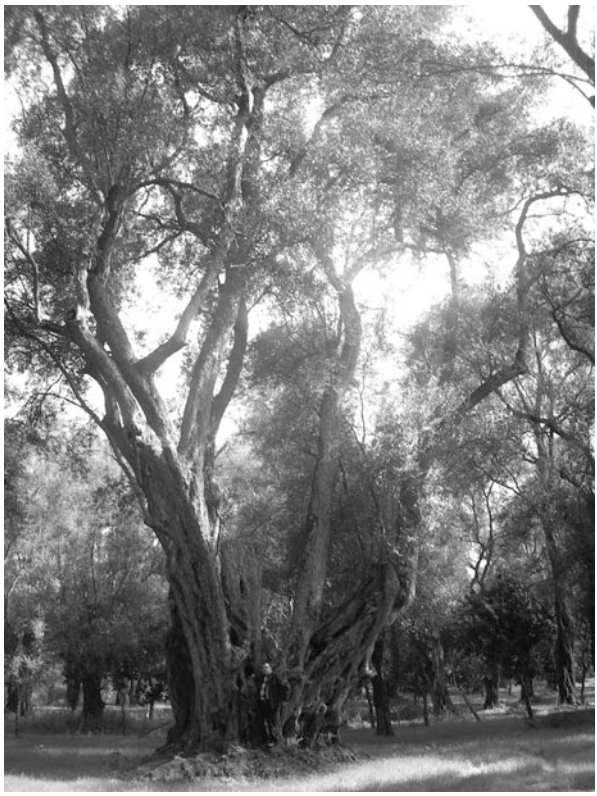

Fig. 23.6 The landscape of Gioia Tauro owes its significance to the monumental features and extension of its olive orchards

was used to drive oil extraction mills (some of the equipment has been restored and is displayed in the communes of Polistena, Cittanova and Varapodio).

Today olive growing is still the main feature of the local landscape ensuring a good degree of integrity. The area is dominated by monumental olive trees, including some 300–400-year-old specimens, and has an almost totally homogeneous appearance, its rather low urbanization rate having allowed it to preserve its traditional structure. This olive-grove landscape is less and less compatible with the logic of modern production, and increasingly dependent on public subsidies. Thus, the area has become economically marginal, in spite of its vast expanses of irrigated plain with a remarkable and manifold agronomic potential. On the contrary, the olive-tree landscape is the central element of local cultural identity.

As regards vulnerability, the expansion of urbanization poses little threat, except in the town of Gioia Tauro itself. The orchards are the result of old-fashioned olive-growing practices and are hence ill-suited to any form of mechanization. This unsuitability to conversion could lead, on the one hand, to abandonment, on the other, to an attempt to modernize the equipment and management systems. This could give rise to new olive-growing models and result in a deep transformation of the local historical landscape. A recent phenomenon is the uprooting of century-old trees which are then sold to be replanted in private properties and villas, often in the north of Italy. The practice is so widespread that in 2006 the area was characterized as “the

supermarket for centenarian olive trees". The phenomenon was even debated within the Parliamentary Anti-Mafia Committee. Other threats include unemployment, the underground economy, dependence on state subsidies, and organized crime, which intercepts financial flows destined for the transformation industry. A further element of vulnerability is the introduction of new crops such as kiwi and protected crops (Fig. 23.6).

23.7 Bergamot Plain (37° 58′ 55.10″ N; 16° 05′ 27.26″ E)

This area is representative of the typical landscape of bergamot cultivation. It has an extension of about 200 ha, mainly privately owned. Until the 1960s an atypical form of tenancy was widespread in the area, involving a separation of soil and stands and, in some cases, sharecropping pacts. It lies in the commune of Brancaleone (RC), 40 km south of Reggio Calabria, and can also be reached by the SS 106 Ionica state road, south of Locri, direction Reggio Calabria.

The area is highly affected by *fiumare*, a characteristic feature of the Calabria landscape, determined by the region's geomorphological characteristics and climate. These are torrents that can pose a hydrogeological risk in the winter and remain dry for at least 4 months in the summer. *Fiumare* leave wide beds with silica-based alluvial silts and mixed clay and calcareous material carried down by erosive phenomena. The local geological formation, with its huge masses of gneiss and mica schist, is typical for the Aspromonte mountain range. The area where bergamot is grown is a plain extending between the sea and the Aspromonte, whose lower slopes are constituted of Jurassic limestone and Quaternary alluvial soil. It belongs to a narrow strip of land, about 5 km deep, that extends along the Ionic coast from the Straits of Messina to Bovalino.

The area is significant for several reasons, including the fact that it has the only bergamot cultivations in the world. The bergamot is a tree that grows to a height of 3–4 m. The flowers are white and have an intense scent. The leaves are glossy and thick, like those of the orange tree, and never fall, not even during the winter. The flowers and new leaves start to grow at the beginning of March. The fruit is slightly larger than an orange and slightly smaller (and less round) than a grapefruit. It has a deep yellow color. The outer skin is smooth and thin, like that of the grapefruit.

According to some legends, the bergamot was imported by Christopher Columbus from the Canary islands. Other sources indicate China, Greece, or the city of Berga in Spain as its place of origin. According to one story, a Spanish Moor sold a branch for 18 *scudi* to the Valentino family in Reggio Calabria, who grafted it onto a bitter orange tree in an estate they owned in the Santa Caterina district. The species, however, is probably autochthonous, since there is evidence as early as the fourteenth century of a citrus tree exclusively cultivated in southern Calabria, *Limon pusillus calaber*. The most plausible etymology is *begarmundi*, a Turkish word meaning "lord's pear tree". It may have derived this name from the fruit's similarity in shape with the bergamot pear. Bergamot essence owes its popularity to the Italian Gian

Fig. 23.7 The Bergamot plain is probably the only area in the world extensively cultivated with this tree species

Paolo Feminis, who, having emigrated to Cologne in 1860, created the formula for *aqua admirabilis*, combining other essences with the oil, manually extracted by pressing the skin of the fruit and absorbing it with natural sponges placed in containers. Eau-de-Cologne, so widely employed today, is based on that very recipe, which Feminis' heirs, the Farinas, patented in 1704 under the name of the German town and popularized all over the world. Ever since, bergamot has remained one of the essential ingredients of this perfume. The first bergamot orchard (*bergamotteto*) was planted in 1750 by landowner Nicola Parisi in his Rada Giunchi holding in Reggio Calabria, presently occupied by the Lido Comunale "Genoese Zerbi", in the city center. The bergamot landscape still shows the typical regular layout of nineteenth-century "citrus gardens". Since the Aspromonte mountain range protects the area from northwesterly winds, its annual temperature and heliophany averages are among the highest in Italy. What distinguishes the Mediterranean landscape of this area from that of other similar areas is its "verticality". Rather than an alternation of olive and citrus orchards, there is a clear-cut separation between the two, the olive trees being always inland of the bergamot.

As regards integrity, what survives of the traditional agricultural landscape, which until the mid 1960s was parceled out among sharecropping farms, are the earth ridges marking the boundary lines between individual holdings assigned by the big landowners. The present landscape is the result of a rather fragmented cultivation system, considering that almost 90 % of the plots have an area between 0.5 and 5 ha. Although this is an old traditional cultivation, many of the orchards were planted in

the early 1960s under the spur of favorable market conditions. This later replanting strongly altered the original tree-planting pattern of the cultivations. Formerly an area of ca. 2,400 ha was given over to bergamot cultivation in the province of Reggio Calabria, today less than 1,500 ha.

As regards vulnerability, the ancient cultural tradition of bergamot cultivation experienced a first crisis in the early decades of the twentieth century, determined by the international marketing of synthetic perfumes. Poor production management, the lack of initiatives to protect the resource—although it has been classified as a PDO since 1931 and it is mentioned in the "Ark of Taste" list by Slow Food—and an inefficient commercial organization are the causes of the objective weakness of bergamot cultivation. To this one must add the average age of the trees, most of which are getting to be very old and will soon be past their usefulness. Besides, the area is under strong and often uncontrolled pressure from the building of private housing and large structures such as malls. If this phenomenon is not regulated it will end up having a negative impact on the landscape. One should also take account of the hydrogeological risk posed by the *fiumare* in this area, which sometimes also threaten human settlements (Fig. 23.7).

23.8 The Riviera dei Cedri (39° 42′ 39″ N; 15° 49′ 19″ E)

This coastal citron-grove landscape extends along the Tyrrhenian coast in the province of Cosenza, from Cetraro to the Lao river. The main towns are Diamante and Santa Maria del Cedro. The area extends over about 600 ha. It is mainly composed of small private properties. Altitudes range between 50 and 300 m a.s.l. It lies along SS 18 ("delle Calabrie") and can be reached from the north by exiting the A3 at Lagonegro Nord, or from the south by exiting the A3 at Falerna. The area is elongated from north to south and narrow from east to west, a typical conformation for littoral strips extending between the Apennines and the sea. The crystalline substratum is the great phyllitic mass of the Sila Apennines, which extends to Mount Sanginento and the middle and low valley of the Buonvicino torrent. The mountains have a pre-Paleozoic and Paleozoic substratum constituted by phyllitic schist, mica schist, granatiferous gneiss, and green schist grading into dolomitic and marble limestone in the Mesozoic strip, with extrusions of seritic and phyllitic schist. Over these formations are Eocene and Miocene trias, and recent alluvial formations in the littoral zones.

The Riviera dei Cedri (Citron Littoral) is a highly significant landscape, not only because of the uniqueness of its typical crop, but also for its remote historical origins. Citron was the first citrus fruit grown outside its area of origin. Known in Iran ever since the seventh century B.C., it was introduced to Greece by Alexander the Great in the fourth century B.C. The Jews became acquainted with citrons during the Babylonian captivity (585–539 B.C.). From 136 B.C. onward, they started to employ them in the Festival of Tabernacles. After the diaspora they disseminated it throughout the Mediterranean, including Calabria, although it had already arrived here previously with the Greeks as early as the third century B.C. The Riviera dei

Fig. 23.8 The traditional citron cultivations

Cedri today is the only citron-growing area in Italy. This valuable and delicate crop, very sensitive to temperature excursions, gives the local landscape its fundamental character, thanks to the efforts of local farmers, who work in very small plots due to the fragmentation of land ownership. To cope with harsh winters, these farmers turned their plots into ingenuously designed gardens with long rows of vertical poles planted next to the plants, and horizontal poles on which to train the branches to form a pergola, to which a roofing of cane or heather mats (*cannizzelli*) was added in the winter months. This practice added a further dimension to the landscape, favoring the formation of thick cane thickets along the margins of the roads connecting holdings and uncultivated areas. As in previous centuries, Jews are still the most important buyers of the fruit. The citron used in the Feast of Tabernacles had to be intact and produced by "pure trees"; that is, trees obtained by cutting or grafting a citron onto another citron, if the wild type was obtained from seeds. The citron produced today in these areas is recognized as a Traditional Agroalimentary Product by the Italian Ministry for Agricultural Alimentary and Forest Policies. Furthermore, its "Liscio di Diamante" variety is included in Slow Food's "Ark of Taste", a catalogue of small productions of gastronomic excellence.

Although citron growing is much reduced today, in some zones the landscape still retains a fair degree of integrity, especially in the interior and at Santa Maria del Cedro, whereas integrity is lower along the coast. The Inchiesta Agraria Branca, a survey conducted in 1883, reports 10,143 citron plants and a yield of 100 fruits per plant. While the second figure is an overestimation, the first is underestimated, since the Agrarian Cadaster of 1929 records citron growing on 220 ha. There was an

expansion until 1970, with the crop expanding to cover 270 ha, then a decline—down to a mere 40 ha in 1991—and then again a recovery to the present 70 ha.

Although some areas still retain their traditional citron-grove landscape, there are several factors of vulnerability. In the first place, the demand for citron is declining sharply. Production has gone down from 7,000 quintal of the 1936–1940 quadrennium to ca. 3,500 today. The period of worst crisis was in the 1970s (2,900 quintal in 1974). In the following decades the general situation slightly improved. Another element of vulnerability is anthropic action, which has determined a drastic reduction of cultivated surface and biodiversity. Today, all the plains on which citron was once grown are now occupied by holiday homes and tourist villages, and the crops have been moved to the interior. In some cases there have also been changes to traditional farming methods, notably the replacement of the local *cannizzelli* with plastic nets (Fig. 23.8).

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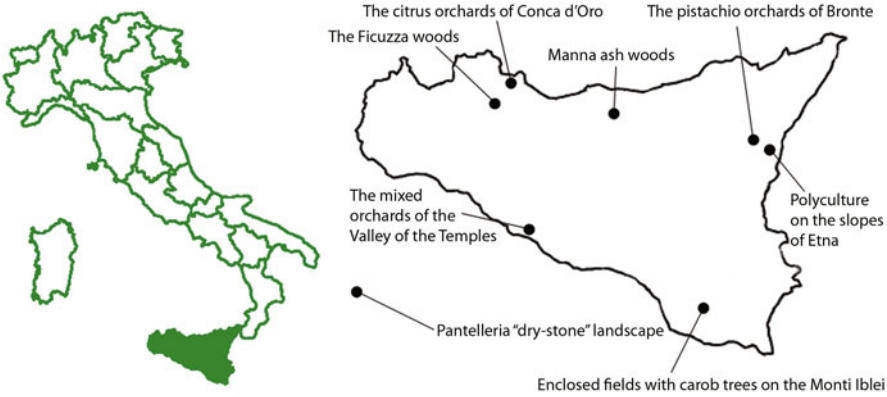
Chapter 24
Sicily

Giuseppe Barbera



24.1 Introduction

Sicily's central position in the Mediterranean, its ecological and biological diversity, and its thousands of years of contact with major agricultural civilizations and their knowledge of plant species, animals, and techniques, as well as their customs and social organizations, have resulted in a variety of agrarian and agroforestal landscapes, often with opposite characteristics. There is indeed a marked contrast between Sicily's mountains, inland hills, and coastal areas, between latifundium agriculture and the Mediterranean garden, between the bare earth of fallow fields and tree-covered areas; a contrast that is not limited to environmental and productive

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aspects, but also extends to the intellectual perception of the island's landscapes. Friedrich Schiller wrote of "the wondrous struggle between fertility and destruction in the meadows of Sicily" (*On the Sublime*). In his account of his Italian tour, Wolfgang Goethe uses an oxymoron—"a desert of fecundity"—to characterize the wheat fields and pastures of the island's inland hills. Giuseppe Tomasi di Lampedusa speaks of a "landscape that knows no middle course between lascivious softness and devilish harshness".

Significant testimonies of Mediterranean forest and maquis, the original vegetation of the island, still survive, but as early as classical antiquity the Sicilian hills and irrigated coastal areas near the larger settlements took on the appearance we are still familiar with today: vast treeless surfaces, green in the winter and yellow after the harvest by effect of the summer droughts. Trees, disseminated in agroforestal systems or concentrated in orchards, many of which are irrigated, are one of the most distinctive characters of Sicilian landscapes. Irrigated orchards crossed by narrow roads and enclosed by walls form what Sereni in 1961 called the "Mediterranean garden landscape". The best known examples are those of the Conca d'oro, in the portion of countryside near Palermo that still survives in spite of many years of uncontrolled building around the city, and the mixed orchards on the slopes of Etna. The landscape of the Conca d'oro—which was historically defined in the Middle Ages by the Arab agricultural revolution—is the result of the introduction of new species (citrus, garden vegetables) and irrigation technologies to maximize their yield. From the mid nineteenth century onward the landscape lost its mixed character to citrus monoculture. Around Etna, instead, the most remarkable elements of the local agricultural landscape are patches of terraced vineyards interspersed with mixed orchards, and dry-stone constructions. These vineyards and orchards form an elaborate patchwork also including lava flows that have been scarcely, or not at all, affected by renaturalization processes or the growth of trees.

Terracing is the most characterizing landscape element on Pantelleria, as well. The island is also known for its unique *jardini* (gardens), circular buildings sheltering citrus trees—sometimes even a single one, and for its olive trees no higher than a meter with their branches trained onto the ground, among which domed buildings called *dammusi* harmoniously blend in. The use of dry-stone masonry—limestone, in this case—also distinguishes the landscape of the plateau of the Iblei mountains. Here a dense network of low walls marks out plots where carob trees provide food and shade to livestock left grazing there after the wheat harvest. This is one of the many unique agroforestal landscapes of the island. Another especially remarkable one is the manna ash landscape on the foothills of the Madonie mountains. Equally distinctive is the landscape of the western versant of Mount Etna, characterized by pistachio trees grafted onto terebinths that colonized lava flows. Finally, among many other landscapes eligible for inclusion in the present work, the choice fell on the mixed almond and olive orchards of Temple Valley in Agrigento, a prime example of the blending of traditional agricultural systems and historical monuments, epitomizing the relationship between nature, history and perception; a relationship that Sicilians should strive to better understand in the future, if they wish to safeguard and make the most of their landscape resources.

24.2 The Citrus Orchards of Conca D'Oro (38° 04′ 11.16″ N; 13° 25′ 15.17″ E)

This peri-urban citrus-growing landscape extends over 700 ha in the easternmost part of the municipality of Palermo. The land is mainly privately owned. Altitudes range between 30 and 240 m a.s.l. The area is delimited by the calcareous Monti di Palermo to the south and east, and the A19 to the north, and borders on the territory of the commune of Villabate to the west. It also borders on the Monte Grifone SCI (Sites of Community Importance), although it is fully outside it. The citrus orchards lie in the sub-municipalities of Ciaculli and Croceverde. They can be reached from Palermo by driving southeast on the Viale Regione Siciliana and exiting onto the SP 37, also known as Via Ciaculli; from here, several roads running through the orchards branch out perpendicularly between Ciaculli and Croceverde. Geologically, the area of the Conca d'Oro—a name designating the plain around Palermo at least since the sixteenth century—is constituted by pelites, sand, conglomerates and limestone. The most common soil is the typical Mediterranean red earth. It is usually rocky and shallow, but nevertheless fertile thanks to ample groundwater availability(Fig. 24.1).

The area owes its significance to the historical persistence of citrus growing in the Palermo area, which dates all the way back to the Arab domination. Until the middle of the last century, the citrus orchards made the plain around Palermo appear as a single vast "garden" (*giardino*), as Sicilian farmers designate a fruit orchard, especially a citrus one. This is the traditional image of the Conca d'oro, "an area of ancient and almost mythical predominance of the tree", rich in water, fertile, and blessed by a mild climate. The landscape is also a significant example of a *polo urbano*, a designation applied in the Italian national rural development plan to areas with agricultural activities and scattered settlements on the outskirts of the country's main urban centers. Although fruit orchards and vegetable gardens were cultivated in the area as early as the ancient Roman period, it is the Arab domination that defined the character of the local landscape. New species were introduced, characterized by high water requirements. These included the bitter orange and the lemon, first grown in the Norman *parchi* and then on more extensive surfaces thanks to technologies introduced during the Arab agricultural revolution. Even back then, the local landscape was characterized by travelers as "paradisiacal". Irrigation agriculture developed in the plain, while grain, carob, olive and almond were grown on mountain slopes and superficial soils. Sugar cane was widespread at least until the fifteenth century. The landscape was an elaborate mosaic of small irrigated and intensively cultivated plots alternating with large dry-farmed areas, a character it retained until the mid nineteenth century, when citrus growing began to expand and soon became exclusive, extending even over areas up to then regarded as unsuited for it. Today only the areas of the villages of Ciaculli and Croceverde are still representative of the traditional landscape of compact monocultures that characterized the Conca d'oro in the nineteenth-century. Here in holdings enclosed by walls (*firriati*) one still finds the traditional *bagli*, fortified storerooms later used as homes. Settlements with closely-packed houses lie along the main roads. At higher

Fig. 24.1 Citrus growing in the area of Palermo dates back to the Arab domination. It made the plain around the city appear as a single vast garden

altitudes, at the foot of the calcareous mountains, the citrus trees are grown on stone terraces. Of the citrus species grown here, the most widespread is undoubtedly the "Tardivo di Ciaculli" tangerine, an endemic variety, not obtained by grafting or selection. It is included in the list of Traditional Agroalimentary Products of the Italian Ministry of Agricultural, Food and Forest Policies, and also a Slow Food Presidium. On a smaller surface (20 % of the total) are grown the Avana tangerine, the Ciaculli giant red medlar, lemons, and small quantities of apricots and oranges.

Today, the landscape of Ciaculli and Croceverde can still boast a fair degree of integrity, having been spared by the urban expansion of Palermo in the 1960s and 1970s. The citrus groves with their closely spaced trees still retain their traditional compact appearance. Main and secondary canals (*saje, cunnutti*...) and collector basins (*gebbie*) draw characteristic patterns on the ground, although these have sometimes been altered by the spread of localized irrigation systems. The landscape partially owes its present integrity to the establishment in 1999 of the "Tardivo di Ciaculli" consortium, with a membership of about 50 farmers. The consortium supports small producers and collaborated with the town of Palermo to institute the Agricultural Park of Ciaculli, within whose territory strict building restrictions were applied.

High farm-surface fragmentation increases the vulnerability of this system, as it does not allow the cutting of production costs. Property fragmentation, the administrative complexity of the irrigation system, and Mafia interference have resulted in a citrus-growing system whose structure and management were already outdated

by the beginning of this century. Thus, in spite of the efforts of the consortium, the structural weakness of local agriculture remains high. To this we need to add the growing pressure of urban expansion, often illegal, which threatens to irreversibly alter the qualities of this historical landscape.

24.3 The Mixed Orchards of the Valley of the Temples (37° 17′ 33.22″ N; 13° 35′ 35.23″ E)

The mixed orchard landscape of the Valley of the Temples extends over ca. 1,400 ha in the municipality of Agrigento. The land is both publicly and privately owned. The Temple Valley plateau, with an average altitude of ca. 80 m a.s.l., is delimited to the north by a hill occupied by the town of Agrigento, the province capital, and by the Rupe Atenea hills, to the south by the town of San Leone. The area is included in the Archaeological and Landscape Park of the Valley of the Temples of the Sicilia Region and since 1997 in the UNESCO World Heritage List. It is also under landscape restrictions as per Law 1497/39. The actual valley lies at the foot of the city of Agrigento and can be reached by SS 115 quater, which then becomes SS 118, better known as "Via Passeggiata Archeologica". The geological substratum of the area is constituted by calcareous tuff or shell breccia, with clay outcrops. A hill ridge runs across the area, the Hill of the Temples, which extends from east to west between the valleys of the rivers San Biagio and Sant'Anna (respectively Akragas and Hypsas in ancient times (Fig. 24.2)).

The area owes its significance not only to the historical importance of the Valley of the Temples, but also to the exceptional landscape in which the temples are set. These archaeological monuments from the classical period lie in the midst of an extremely interesting agricultural landscape, representative of a mixed tree dry farming that once dominated the Sicilian landscape, where for ecological and social reasons arboriculture had prevailed over plough-land. According to historiographic tradition, the city of Agrigento was founded in the sixth century BC by a group of Greek colonists in a favorable geographical location. The fertile land produced grain, wine and olive oil in abundance. The hilly morphology of the area was propitious to livestock and horse breeding. These conditions favored an extraordinary development and economic growth. In less then two centuries from its foundation, Akragas became one of the most populous cities in the Greek world and one of the centers of Hellenic culture in the Mediterranean. Today, the Valley's landscape is dominated by vast orchards of almond associated with olive trees, and with some carob, barbary fig or pistachio on the less fertile or rocky soils. Until a century ago the landscape was prevalently one of rather sparsely treed plough land where grain, broad beans and French honeysuckle were grown in alternation with fallow pasture. The tree spacing is irregular and the trees are of uneven ages. Their average density is of 60–150 specimens per hectare. In collaboration with the Department of Arboriculture of the University of Palermo, a Living Museum of the Almond Tree has been established

Fig. 24.2 The agrarian landscape of the Valley of the Temples originated around the 6th century B.C.

in the Park. Here the genetic heritage of the ancient Sicilian almond varieties is preserved. The museum also houses the Kolymbetra Garden, entrusted to the care of the FAI of the Sicilia Region. The citrus orchards and irrigated vegetable gardens along the Sant'Anna river and the long narrow Kolymbetra valley have remarkable landscape value. The combination of archaeology and agricultural landscape and the early winter flowering of the almond trees make this one of the most significant landscapes in the Mediterranean, a true summa of the Mediterranean's peculiar historical, naturalistic, and cultural traits.

The Park's activity has drastically reduced the threat of previously recurrent episodes of uncontrolled building. The area has thus managed to retain its principal agricultural features, partly thanks to the planting of new trees, although it is still crossed by incongruous, congested car roads. The "wood of almond and olive", as Pirandello described it, still retains the character of a traditional farming system, in spite of signs of degradation. It can still perform many productive, environmental and social functions, as well as maintaining its aesthetic value.

The vulnerability of the Valley of the Temples nevertheless remains especially high, in spite of the numerous conservative actions undertaken so far. The principal threat is the high human pressure on the area. Uncontrolled urbanization has strongly altered the fabric of local agriculture. The modern development of the city of Agrigento has betrayed the character of the old nineteenth-century city and heavily undermined the integrity of the Valley of the Temples. Furthermore, the Hill of

the Temples has been impacted by serious hydrogeological problems, addressed by recent restoration campaigns. The local environment is being deeply altered by the construction of roads and unauthorized buildings, which are increasing the fragmentation of the landscape and leading to the loss of its original characteristics.

24.4 The Ficuzza Woods (37° 52′ 54″ N; 13° 23′ 26″ E)

The forest and silvopastoral landscape of the Royal Hunting Lodge (Real Casina di Caccia) in the woods of Ficuzza and the Cappelliere extends over ca. 2,000 ha at altitudes between 600 and 1,650 m a.s.l. (at the top of Rocca Busambra). The area lies within the municipalities of Corleone, Godrano and Monreale in the province of Palermo. It is included in the "Bosco della Ficuzza, Rocca Busambra, Bosco del Cappelliere e Gorgo del Drago" oriented natural reserve, as well as two sites of the Natura 2000 network. The land is both publicly and privately owned and under landscape restrictions (Laws 1497/39 and 431/85). It can be reached from the town of Corleone by taking SS 118 to Marineo and turning right towards Borgo di Ficuzza about 14.5 km from Corleone. The area can also be reached from Godrano by driving towards Ficuzza on a secondary road through the sub-municipality of Santa Barbara. Several local roads lead from Borgo di Ficuzza into the woods. The wooded hilly area has quite a composite physiography, due to its clayish-calcareous or arenaceous-siliceous matrix. The latter is prevalent in the northeast hills, where widespread rock outcrops heavily influence the distribution and composition of the forest cover. The area is dominated by spectacular calcareous formations culminating in Rocca Busambra, which overlooks the woods below like an immense theater wing(Fig. 24.3).

The area owes its significance to its historical significance and the importance gained by the woods of Ficuzza in the Sicilian landscape and the Palermo area over the last two centuries. The historical origins of the present landscape can be traced back to the end of the eighteenth century. When the French occupied the kingdom of Naples, Ferdinand I of Bourbon sought refuge in Sicily. A keen hunter, the king had a hunting lodge erected here, the "Real Casina"—an exquisite building, recently restored—and transformed the area into a hunting reserve, like the many that once existed all over the Italian peninsula. The village of Ficuzza itself was established and expanded as an annex to the hunting reserve, right in the middle of the homonymous forest, next to the Bourbon palace, on whose grounds was a farmhouse. "The woods were beautiful and well cared for. Many herds of all kinds, excellent crops and pastures and abundant game were the King's pride". After inheriting the hunting reservation, Ferdinand II abolished it. An agroforestal system arose in its place, based on woodcutting, charcoal making and animal husbandry.

In 1871, the area was placed under the jurisdiction of the Italian Forest Administration. The district was declared inalienable, and Law 535 of 29 December 1901 destined it to become a climatic resort. Indeed, during the following years the area became a favorite summer sojourn location for the citizens of Palermo. In 1912, the

Fig. 24.3 The historical origins of the present Ficuzza landscape can be traced back to the end of the 18th century, when Ferdinand I of Bourbon came to Sicily

"Foresta Ficuzza" became the property of the State Company for public forests. In 1948, all the land was assigned to the Public Forest Company of the Sicily Region. In 2000, the present reservation was instituted. The landscape is dominated by woods of deciduous and evergreen oaks (downy, holm and cork) in mixed and single-species groves, and pastures and meadows with small cultivated fields bordered by small olive groves and vineyards. There are still many old *bagli* and farmhouses. Among plant species, two endemic ones are especially worthy of mention, *Quercus gussonei* and the Sicilian *bagolaro* (*Celtis asperrima*), as well as many species of orchids. Of the large mammals once present in the area only the fallow deer and boar are still found, both having been reintroduced by the park management in a few controlled areas. The avifauna, instead, is very varied, including great spotted woodpecker (*Dendrocopos major*), golden eagle (*Aquila chrysaetos*), pilgrim falcon (*Falco peregrinus*), Egyptian vulture (*Neophron percnopterus*), black kite (*Milvus migrans*) and red kite (*Milvus milvus*). Naturalistic and historical-cultural elements thus combine to form a unique and especially significant landscape including some especially scenic natural features; most notably, imposing rocky and semi-rocky formations along the cliffs of Rocca Busambra with remarkable floristic and faunal peculiarities. In a mostly sparsely wooded region, highly transformed by agriculture over the centuries, the Ficuzza forest stands out today as the largest green area in western Sicily and the closest "green lung" to the vast urbanized area of Palermo 36 km away.

The area has undergone several modifications over time, always as the result of significant human activity in the course of history. The local use of forest and pastoral resources never constituted a threat to the landscape's integrity. However,

while until recently the silvopastoral use of local resources remained sustainable and judicious, over the last few decades it has increased excessively. The main problem is overgrazing, which has compromised the traditional sustainable management of pastures and its harmonious coexistence with the evolution of the forest.

The landscape's vulnerability has hence become quite high. It is remarkable that until the early twentieth century grazing in the district was only allowed periodically in cases of need, and was carefully controlled by the Forest Troops; whereas today livestock is frequently grazed even in areas where it is forbidden. The vulnerability of the area is further increased by increasingly frequent fires, as well as the failure to implement forest maintenance plan, which has led to further deterioration as a consequence of the abandonment of traditional cultural practices such as coppicing. Silvicultural operations are carried out only occasionally, rather than as steps in a consistent program to ameliorate the ecological stability of the area's forest and pastoral resources. The overall situation is thus one of general silvicultural management problems and a lack of operative planning.

24.5 Enclosed Fields with Carob Trees on the Monti Iblei (36° 52′ 54″ N; 14° 33′ 50″ E)

The pastured carob-grove landscape of the Monti Iblei extends over ca. 800 ha in the municipality of Ragusa, at altitudes ranging from 250 to 400 m.s.l. The area is privately owned, with the exception of the Castle of Donnafugata, which belongs to the commune of Ragusa. The Monti Iblei tableland is crossed by several valleys with streams running in them. These valleys are under restrictions as per Law 431/85. To reach the Castle of Donnafugata at the center of the area, one takes the SP 25 southward to Ragusa, then turns onto the SS 115 in the direction of Vittoria after a few kilometers. After 1.2 km one exits SS 115 and takes SP 60, then SP 80. Another way to reach Donnafugata is a 20 min train ride from Ragusa. The stop is a small station on the Ragusa-Comiso line, 500 m from the castle. The area under examination lies in the south-eastern part of the Monti Iblei. It extends over a tableland declining from the mountain plateaus to the coastal plain. The geological substratum is constituted by soft or marly compact Val di Noto limestone, sometimes bituminous. Narrow ravines characterize the area.

The closed-field agrarian landscape of the southern Monti Iblei plateau owes its significance to the historical persistence of a close-knit reticule of dry-stone walls forming geometric polygons known as *chiuse*. Ever since the fourteenth century, when the land was granted to farmers under emphyteutic leases, the *chiuse* have enclose arables and monocultural or, more often, mixed orchards of olive, almond, and especially carob trees. The name "carob" (*Ceratonia siliqua* L.) derives from the Greek *keras*, meaning "horn", whereas the Latin second element of its scientific name, *siliqua*, refers to the shape of its pod-like fruit. Due to their relative uniformity of weight, carob seeds were used in past times as a unit of measure for metal and valuable materials. In Greek they were called *keration*, the ancestor of the word "carat", still used today to designate the unit of measure of the degree of purity of

certain precious materials. The carob is an evergreen species typical of the southern basin of the Mediterranean. It can live as long as 500 years, does not need to be watered, and is hence especially well adapted to arid or rocky terrain. The carob tree hence epitomizes the landscape of this area and enhances its beauty. Both the fruit and other parts of the plant are used for a vast range of alimentary uses, as well as in pharmaceutics and folk medicine. The Ragusa area is the principal carob-producing area in Italy, whereas the Mediterranean as a whole accounts for almost all of the world production. Especially remarkable local agricultural products include the PDO-designated "Monti Iblei" oil and the Ragusa Carob. The latter is included in Slow Food's "Ark of Taste" list of small productions of excellent food. The carob trees put a strong stamp on the landscape. They grow in irregular patterns, with average densities of 10–20 trees per hectare. The low stone walls answer both the need to clear the ground of rocks and that to delimit and fence off land to allow a regular rotation of cultivation and grazing. Centuries of human use have left their mark on the landscape. Quarries are widespread, as are mills, aristocratic villas, *masserie* (farmhouses), *pagliari* used by shepherds as shelter and for equipment storage, *neviere* (ice houses), *carcare* (lime kilns), *muntieddi* or *muragghia* (rock mounds), and *mannare* (fences for livestock or vegetable gardens). Another characteristic feature are the *manniruni*, circular stone enclosures built around individual trees to protect them from grazing animals. The Castle of Donnafugata is a landmark in the area and played a central role in the organization of local agriculture. It was erected onto a fortified farmhouse allegedly built by the Chiaramontes, Counts of Modica in the fourteenth century, although its origins are actually far from clear. In 1648 it was purchased by Vincenzo Arezzo-La Rocca, who converted it into a country house. Most of the building, however, is the work of his descendant, the Baron Corrado Arezzo de Spuche, an eclectic scholar and politician who transformed it into a lavish aristocratic residence. Thanks to his strong political influence, the Baron even managed to have the course of the Ragusa-Comiso railroad line modified to run closer to his castle so that he could have his own train station. After years of neglect and abandonment, in 1982 the castle was purchased by the commune of Ragusa and opened to the public after long renovation works. Around the castle is a vast monumental park extending over 8 ha. It had over 1,500 trees and several amenities meant to entertain guests, such as a small round temple, a coffee house, some artificial caves with faux stalactites, and an unusual labyrinth built with typical Ragusan dry-stone masonry.

The area still retains its characteristic local landscape of wooded pastures and *chiuse*, with well-preserved terraces along the deep ravines. The integrity of the system is preserved thanks to its enduring agricultural use, based on a biennial rotation system. The woods are also in good condition, although over time pruning and sucker removal are being increasingly neglected. The state of abandon is less evident in the most grazed-in *chiuse*. The carobs still continue to perform their productive and environmental functions, as well as providing shelter from the sun for the animals, which often seek their dense shade.

As regards vulnerability, in recent years the coastal landscape has witnessed intensive and uncontrolled settlement expansion. This has altered its traditional agrarian landscape, characterized by orchard crops such as almond, olive, vine or citrus,

Fig. 24.4 The carob tree landscape of the Monti Iblei shows unique features thanks to a set of well-preserved and still productive historical features

in association with wooded arables or uncultivated land. Fortunately the area is not exposed to major threats, other than renovations of private villas and farmhouses conducted without regard for traditional forms and materials. Some of the farmhouses are presently abandoned. New threats to the traditional landscape are being posed by the spread of wind turbine parks and the creation of golf courses. Yet another element of vulnerability is competition with other Mediterranean zones producing the same crops (Fig. 24.4).

24.6 Manna Ash Woods (37°57′54″ N; 14°07′06″ E)

The agroforestal manna ash grove landscape extends over ca. 1,000 ha in the northeast part of the province of Palermo, in the municipalities of Pollina, Castelbuono, with a small portion lying in the western territory of the municipality of San Mauro Castelverde. The ash groves, mostly privately owned, lie at altitudes between 100 and 650 m a.s.l. The ash-grove area is partially included in the Madonie Regional Natural Park and under landscape restrictions as per Law 1497/39. It can be reached by exiting the A20 highway at "Castelnuovo-Pollina" and taking SS 286, then after 5.5 km turning right onto a local road that runs through the ash grove landscape. As an

alternative, one can take SP 52 from the coast toward San Mauro, which runs along the area at Borrello Alto. The geological substratum of the area is arenaceous-siliceous with a more or less cemented, variable texture. Southwest of Castelbuono it connects to the earlier imposing calcareous rises of the upper Madonie, which dominate these Tyrrhenian valleys. The area is hilly, with a very elaborate morphology. Several small secondary valleys drain directly into the Tyrrhenian Sea, while others further to the south belong to the Pollina river basin.

The area owes its significance to the uniqueness and historical importance of its ash-growing tradition, which goes back to the Arab domination. The earliest document mentioning manna in Sicily is a diploma of the bishop of Messina dating back to 1080. The growing of manna ash, however, apparently dates further back to the Arab domination (ninth-eleventh century). In the eighteenth century, manna ash growing witnessed a remarkable expansion. By the early decades of the nineteenth century, manna groves in Sicily occupied a total of ca. 3,000 ha, all in the province of Palermo. By 1929 their extension had grown to 6,699 ha in all the region, and remained as much until World War II, when with the spread of synthetic mannite a gradual reduction of the ash groves began. In the 1950s, thousands of quintals of manna were still exported or processed in mannite factories. During those years, the pro capite harvest was ca. 300 kg a year vs. 90 today. The present landscape of the district under consideration is constituted not only by manna ash groves, but also of northeast Madonie olive groves, and of mixed fruit orchards on hills and at field edges. The growing of manna ash is very limited today, taking up only 250 of the 1,000 ha of the district, mostly on rugged terrain regarded as less suited for more profitable crops. The species, however, is an important landscape feature over a much larger area than that which it actually occupies, since the ash groves are scattered over a total area of ca. 4,500 ha. The dispersion of the groves and their frequent promiscuity with other traditional fruit-tree species have given rise to a traditional agroforestal landscape of unquestionable value, unparalleled elsewhere in the world, where the ash alternate with olive trees—including many centenary ones—almond, pear and other minor fruit-bearing species, often confined to very marginal locations. In the most acclivitous parts of the district seasonal grazing is also widespread, while herbaceous and vegetable cultivations are associated in the more level areas. The ash groves (*Fraxinus ornus* or *Fraxinus angustifolia*) are mostly composed of trees of uneven ages, irregularly spaced out with an average density of ca. 280 per hectare. The trees begin to be productive at 6–8 years of age. The ash grower, known as *mannaluòru* or *ntaccaluòru*, cuts 5–10 cm long slits (*ntacche*) with a very sharp billhook through the whole thickness of the bark to the sapwood, starting 5 cm above the ground. From these slits, a purplish and bitter liquid flows out which becomes sweet and white through contact with the air and rapidly coagulates, forming a thin crystal-like layer: the manna. As soon as it oozes out of the slits, the liquid sets along the trunk, forming *cannoli*, or runs to the foot of the tree, forming *manna in sorte*. The manna gathering period goes from July to August. The best manna is obtained from trees grown on arenaceous-calcareous soils facing southeast, where the last generation of ash growers is keeping alive this precious cultural heritage. Today the "Manna delle Madonie" is a Slow Food Presidium. Most is processed to make

Fig. 24.5 The ancient cultivation of manna ash is quite rare in the Italian landscape. It was brought to Sicily at the time of the Arab invasion

mannite, which, packaged in loaves, is used in the cosmetic and pharmaceutical industries, as well as in confectionery as a sweetener.

The integrity and extension of the manna ash landscapes have been drastically reduced during the last century. Today the crop is struggling to survive: only 20–30 % of the groves are actually productive. Most of the ash groves are no longer being cultivated. The roughly 150 mostly elderly ash growers, gathered in a public consortium, continue to perform the ritual of incising the bark year after year. Over the last few years, the price of manna has significantly increased, becoming profitable. This has favored a timid recovery of cultivation. Furthermore, new potential commercial outlets are discernible in the sector of biological production. It is possible and desirable to promote ash cultivation, both for its economic potential and as a means to improve the landscape of a vast area within or adjoining the Parco delle Madonie.

As regards vulnerability, ever since the spread of synthetic mannite, ash cultivation has begun a gradual decline, becoming at once the cause and the effect of migration from the local hill and mountain areas towards the cities. Uncultivated ash groves are threatened by secondary successions as other tree and shrub species colonize them, as well as frequent fires. In some areas they are being replaced by vineyards. The Park's management policies are hence of crucial importance for the survival of the ash landscape. Another element of vulnerability is the risk of losing important know-how and very special traditional cultivation techniques handed down over the centuries (Fig. 24.5).

24.7 Pantelleria's "dry-stone" Landscape (36° 45′ 34.54″ N; 12° 00′ 56.35″ E)

The area is a patchwork of traditional, non-irrigated cultivations on stone terraces on the island of Pantelleria. It extends over c. 1,000 ha, mainly privately owned, in the province of Trapani. It is placed under the protection of Natura 2000 network sites and the Oriented Natural Reserve "Isola di Pantelleria". The island lies in the Channel of Sicily. It has a surface of c. 83 sq. km, and lies ca. 95 km from the coast of Sicily (Capo Granitola) and ca. 67 km from the Tunisian coast (Ras el-Mustafà). To reach the area under consideration here from the center of the town of Pantelleria, one drives on SP 54 to Scauri, and from here on to Rekale and the Serraglio district. The island's morphology depends on its exclusively volcanic geological nature. It is formed of several superimposed lava masses from eruptions that followed one another over time, resulting in different geological landscapes depending on their silica content: The more extensive acid rock formations (rhyolite, pantellerite, and trachyte) have harsher and more precipitous shapes, whereas the basic rocks, mainly concentrated in the northwestern part of the island, decline more gently towards the sea.

The area owes its significance to the historical persistence of terraced cultivations and the unique beauty of its landscape. As archaeological investigations have shown, large surfaces of the island were already terraced many centuries ago, bearing witness to the efforts of the island's farmers to make up for severe environmental constraints such as strong winds, the lack of fresh water springs, and the scarcity of level ground. Agriculture began to expand from 1845 onward, following the abolition of the local fiefdom, when small farmers began to terrace even the island's furthermost areas. A singular feature of the local landscape are the so called "gardens", also known as *orti panteschi* (Pantellerian vegetable gardens). These are actually dry-stone buildings up to 4 m tall and with walls about 1 m thick, used as shelters for fruit trees, sometimes even a single one. These are usually citrus, which could not be grown otherwise due to their vulnerability to the wind and high water requirements. The shade, protection from the wind, and condensation of dew on the surface of the lava stones generate a microclimate allowing the trees to grow and bear fruit even in the total absence of irrigation. For the rest, the agriculture of Pantelleria has always thrived on drought-resistant species, cultivated with specific dry-farming techniques maximizing the soil's water-retentive properties and reducing leaks along the surface by increasing seepage. The species grown on the island were chosen for their low water requirements and resistance to the wind, which is increased by specific cultivating systems. Grapevine is still the most widespread crop on the island today. The low Pantelleria grapevine, typical of the Phoenician and Greek colonies of Sicily, is grown in hollows that gather rainwater and protect the grapes from the wind. The olives are pruned to make them assume collapsed shapes with their branches resting on the ground, and thereby maximize the protection afforded by the dry-stone walls from the wind and sea air. Capers are grown, exceptionally, as monocultures on often imposing terraces. The dense network of terraces and dry-stone boundary walls is interspersed with *dammusi*, vaulted buildings with various room arrangements and annexes, used as houses or shelters. Each *dammuso* has a cistern where rainwater

Fig. 24.6 Dry stone dominates the landscape in Pantelleria, characterizing vineyards, olive orchards and caper cultivations. The photograph shows a terraced caper grove

gathered from the roof is conveyed. Next to them one frequently finds *stenditoi* (stretchers), facing south, where the grapes were placed to dry, and a round threshing floor where a donkey of a local breed was walked around to trample grain.

The area still displays remarkable integrity. However, for years the island's agriculture has been undergoing a serious crisis, due to the unsustainable rise of the costs of terrace farming and the growth of the competing (in terms of labor and investment) tourist business, which has changed some of the original characters of the local landscape. As a consequence, this area, a prime example of the island's traditional landscape, shows some signs of abandonment, although most of its farming activities endure. Maquis species are encroaching on abandoned plots, and the retaining walls of the terraces are collapsing.

As regards vulnerability, it should be noted that on Pantelleria viticulture gained increasing importance until the 1950s/1960s. The subsequent crisis, only partially cushioned by the success of caper growing, is still ongoing, in spite of the fact that local farmers or businessmen, mostly from Sicily, still cultivate some vineyards (only 10 % of the original wine-growing surface, prevalently on level areas or on terraces partially cultivable by mechanical means), placing their stakes on the growing popularity of sweet wines such as *passito* and *moscato*, in the production of which the island excels. Abandonment is thus the main vulnerability factor, along with the effects of the growth of the tourist business. Another problem is restoration carried out on the terraces and the *dammusi* that did not take adequate account of their traditional building characteristics, and thus altered their original design (Fig. 24.6).

24.8 The Pistachio Orchards of Bronte (37° 43′ 57″ N; 14° 49′ 48″ E)

This pistachio landscape extends over ca. 1,000 ha on the lower slopes of the Etna volcano, in the municipalities of Bronte and Adrano in the province of Catania. The land is all privately owned. Altitudes range between 400 and 900 m a.s.l. The area is partially included in the Etna Regional Park and the "Piano dei Grilli" SCI (Sites of Community Importance) and SPA (Special Protection Area), and is under landscape restrictions as per Laws 1497/39 and 431/85. The pistachio groves can be reached from roads branching off SS 284, which connects the town of Bronte to that of Adrano. Our area lies halfway between the two towns, at the border between their territories. The area is also crossed by the Circumetnea, a historical narrow gauge panoramic railway. The geological substratum of the area is entirely composed of basalt from the Etna volcanic edifice, which stands between the Ionian Sea to the east, the valleys of Alcantara to the north, and the Catania plain to the south and west. The Etna dominates the district and puts its stamp on the landscape. In the area are more or less recent lava flows and abundant basalt outcrops.

The landscape owes its significance to the historical persistence of pistachio growing, an heirloom of the Arab domination of the island. The pistachios are grown on the slopes of the Etna, where mixed fruit orchards and vineyards provide a strong contrast to the harsher landscape of the more or less recent lava flows. Pistachio-growing was introduced in Sicily by the Arabs, but only in the nineteenth century did it expand significantly, especially on the slopes of the Etna. In 1860, whole pastures and uncultivated plots were turned into pistachio groves and the plant became the hub of the area's whole farming and economic system. The local population set up an agroforestal system combining pistachio trees with other fruit-bearing trees (olive, Barbary fig, almond) and numerous shrubs and spontaneous species (broom, tree spurge, evergreen pistache, terebinth), growing on very rocky basalt terrain that could not support a more intensive agriculture. The pistachio trees are grafted onto spontaneous terebinths (wild Pistacia). The tree spacing is thus irregular, with density oscillating between 50 and 500 plants per hectare. The trees are grown on irregularly shaped terraces adapted to the craggy and complex morphology of the volcanic slope. Unlike those found on other slopes, the retaining walls are discontinuous and built with stone left completely rough. Rural buildings, when present, are very simple, single-roomed (*casedde*) or double-roomed, often with a terraced roof with a staircase leading up to it. A characteristic element of the agricultural landscape is the *asciugatoio* or *stenditoio*, a level stretch of beaten earth in front of the small building where the fruit is dried and cleaned. It is usually the farmer himself who hulls and dries the fruit, which he then sells in shells to export companies. The rocky terrain hinders mechanization, determining high costs. A biennial production cycle is hence required. The "Bronte Green Pistachio", much in demand in confectionery and ice cream production for its aroma, is PDO-designated (Protected Designation of Origin) and included in Slow Food's "Ark of Taste" catalogue.

Fig. 24.7 The pistachio orchards of Bronte produce a rare typical crop and form a unique landscape characterized by the irregular shape of terracings and volcanic soils

The pistachio grove landscape is quite intact, although abandonment and renaturalization are negatively influencing its conservation. In spite of evident agronomic limitations, the crop remains vital thanks to its excellent quality, which still finds outlets on foreign markets. The integrity of the pistachio groves is maintained thanks to the work of over 1,000 producers, mostly owning holdings of about a hectare each, while only a few big producers own multiple hectares. In Italy, pistachio is only grown in Sicily. Presently the region's biennial production amounts to ca. 16,000 quintal a of shelled product, 80 % of which is exported, the rest sold on the national market. Terrace retaining walls and other structures are still largely in use and in good condition.

Structural and environmental factors make the Bronte pistachio landscape vulnerable. A quality-based strategy may not be sufficient to keep up with a growing market and increasingly strong competition. Because of the impossibility of mechanization, the cultivation costs of the Bronte pistachios are necessarily higher than elsewhere. Sales are hence diminishing as a result of competition from low-cost pistachios from Iran, Turkey, Afghanistan, Greece and South America. In areas where cultivation has come to an end, renaturalization processes are causing evident landscape transformations. The management strategies adopted by the protected area system set up to conserve the pistachio groves are hence of crucial importance (Fig. 24.7).

24.9 Polyculture on the Slopes of Etna (37° 48′ 57″ N; 14° 54′ 21″ E)

The mixed arboriculture area on the northwest slope of the Etna extends over ca. 1,000 ha in the municipalities of Maletto, Bronte and Randazzo, in the province of Catania. Mixed arboriculture is practiced at altitudes ranging between 850 and 1,300 m a.s.l. The land, all privately owned, lies within the Etna Regional Park and is under landscape restrictions as per Laws 1497/39 and 431/85. The area can be reached by SS 284, which connects Bronte, Maletto and Randazzo. The road runs along part of the western boundary of the area and through part of its northern portion, at its lower altitudes. Many secondary roads branch out from the SS 284, going up the slopes of Etna among the orchards. The Etna volcanic edifice, which rests on a submarine clay bank covered with basalt extrusions, stands between the Ionian Sea to the east, the valleys of the Alcantara and the Simeto to the north, and the Catania plain to the south and west. The Etna dominates the district, putting its stamp on the landscape. The area examined here lies on the northwest slope of the volcano, on a tephrite and phonolite plateau with gentle slopes.

The area owes its significance to the permanence of a traditional agriculture with remote historical origins, based on vineyards, mixed orchards, and pistachio. These grow on terraces at higher altitudes, contrasting with the harsh lava-flow landscape. The agroforestal landscape is enhanced by dry-stone rural constructions, including low walls (*chiuse*) and terrace walls. This combination of crop variety and rural constructions makes for a unique traditional landscape extending all around the lower slopes of the highest volcano in Europe. The area is part of a much larger district characterized by terracing and a very complex mosaic of plots delimited by hedges or dry-stone walls and roads connecting them, often running along recent lava flows or patches of woodland. On these agricultural and agroforestal plots, local fruit trees at high genetic erosion risk are grown. The cultivated species are pear, apple, plum, chestnut, walnut, hazelnut, olive, and cherry, usually in association with shrub vines. Barbary figs are widespread. Many of the local products have gained official recognition, a testimony of their distinctiveness and specificity to the area. This includes the "Etna Cherry", awaiting PDO (Protected Designation of Origin) designation; the PDO Etna Barbary Fig; and the Etna "Tabacchiera" Peach, which is included in Slow Food's "Ark of Taste" catalogue of heritage foods. The wines produced in the area are designated as "Etna DOC" (Controlled Origin Denomination). The fruit-tree groves often border on old chestnut coppices and evergreen and deciduous oak woods, once kept under constant care, being a source of firewood and poles for traditional agriculture, as well as grazing grounds for livestock. The result is an elaborate agroforestal mosaic in which elements of the area's natural arboreal flora are recognizable, as well as both manmade and natural microsites including dry-stone enclosures, terraces, stone mounds, dead wood, rock outcrops, tree and shrub ecotones, and the dense foliage of autochthonous tree species.

Many of these mixed cultural systems still display a high degree of integrity, also reflected in their high specific and structural biodiversity. Tree density is high

Fig. 24.8 The polycultures of the Etna slopes form a fascinating traditional landscape, made up of small scale cultivations, structures and other man-made features, enhanced by the colors of volcanic rocks and a peculiar scenery

on the still well-preserved old terraces, whereas the plants are more spaced out on the more recent ones, which are broader to facilitate mechanized operations. The typical traditional building in orchards, when present, is the *magazzino*, a simple single-room storehouse with a steep pitched roof where the fruit is stored. These are seldom used as dwellings. Both the storehouses and their annexed structures such as cisterns, stables and barns are well preserved, as are the paths in and between plots. Overall, this is still a well maintained and essentially intact landscape.

The area's principal vulnerability factor is abandonment. After the great nineteenth-century expansion of agricultural and terraced surface along all the lower slopes of Etna, a trend to abandoning higher-altitude cultivations set in. The reason was the low profitability of high-altitude agriculture and the migration of the population from the local small urban centers to the larger towns along the coast. More recently, the institution of the Etna Regional Park has been perceived as an obstacle to the sustaining and improvement of agriculture at higher altitudes. This gradual abandonment has triggered natural dynamics of transformation of the traditional agroforestal landscapes, some of which now threaten to disappear as spontaneous species rapidly recolonize them. Among several negative effects of this process are the loss of intraspecific as well as specific diversity of cultivated woody species—for example, of the great local variety of tree fruit species –and instability and collapsing

of dry-stone structures through lack of maintenance. Furthermore, at lower altitudes these landscapes are frequently being eroded by discontinuous residential and seasonal urbanization radiating out from inhabited centers, since the whole district is placed under strong anthropic pressure, being a destination for skiing, naturalistic, agroforestal, and food and wine tourism (Fig. 24.8).

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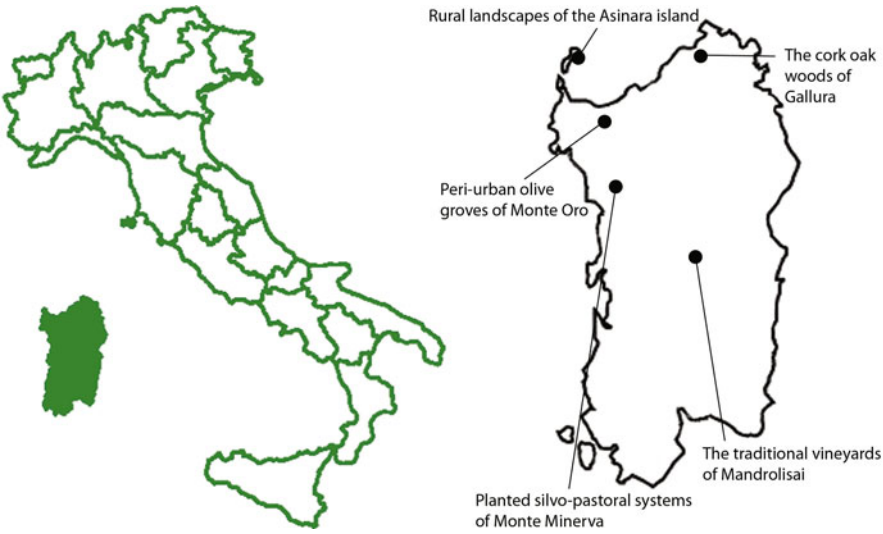
Chapter 25
Sardinia

Sandro Dettori



25.1 Introduction

The dominant characteristic of Sardinia's rural landscape is its vastness. Maquis and permanent natural pastures extend over almost half of the island, whereas tall woods and farmland are found in specific districts, the former on hills and mountains, the latter in the plain and around towns. Land classified as woodland occupies over 50 % of the island. The utilized agricultural surface amounts to about 42.4 % of the total, with a prevalence of pastures (51.5 %) over cropland. The island's landscape is hence

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not that of a "Mediterranean garden", but rather one of steppes, oak savannahs, and a disorderly but not disharmonic, colorful mosaic of shrubberies. This is the result of a centuries-long process during which free-grazing sheep put its stamp on the natural environment, giving the Sardinian landscape a character that is unique in Italy.

One interpretive key for the island's traditional agrarian landscapes can be sought in the historical contrast between the peasant world, long centered on the growing of durum wheat, and the pastoral world, which remained confined to the hills of central Sardinia until the early twentieth century. The most typical expression of the Sardinian peasant world can be found in the villages of the large southern plain of Campidano and the gentle marly hills closing it off to the east. On the island, scattered settlement is the exception rather than the rule. Only in Gallura did populations from Corsica establish a network of *stazzi*, isolated, self-sufficient settlement units. In the rest of the island, instead, fields are arranged in a well-defined pattern, in concentric circles with a narrow strip of vegetable gardens and orchards in the center, protected from grazing cattle by thick hedges of barbary fig. Beyond this *hortus* extend wheat fields and fallow fields crisscrossed by a dense network of paths. This was collectively owned land known since ancient times as *vidazzone*. Its rules of joint management, codified in the fourteenth century in the *Carta de Logu* of the Judges of Oristano, still influence land management practices in many rural villages. Past the wheat fields, the maquis and shrubs gradually thicken to form an area where local populations exercised their ancient *ademprivili* rights (wood and shrub cutting, acorn gathering, and grazing).

Only around "royal" towns such as Alghero, Bosa and Sassari is crop distribution determined by modern planning rather than medieval custom. These towns are surrounded by olive groves and vineyards, although the latter were reduced by phylloxera at the end of the nineteenth century. It is hence these crops that have been most impacted by the inevitable expansion of residential and commercial neighborhoods since the second half of the last century. Pastoralism, however, has also given rise to another land management model centered on the free-roaming raising of meat cattle in forestland, a model analogous to that of the Spanish *dehesas* and *montados*, based on the multi-functionality of farms. Cork, lumber and charcoal, hay and acorns, milk and meat form the basis of a farming economy that is especially widespread on the granite hills of Gallura, but is also found on the volcanic hills of northwestern Sardinia and on the Montiferru range.

Sardinia is also a region where the Italian state has made its presence strongly felt through land reclamation and agrarian reform, as well as the military occupation of vast areas. The Fascist regime reclaimed marshy or underused areas, rearranging them in grids of regularly laid out holdings connected to an urban center providing essential services. Thus were born Arborea (formerly Mussolina), in west-central Sardinia, and Fertilia in the northwest. In the former area, rows of eucalyptus (now aging and never renewed) enclose maize and vegetable fields, while the vineyards of the 1960s agrarian reform extend over the latter.

Today, traditional agriculture is incapable of facing competition from the residential use of land in peri-urban or tourist areas. This decline could be slowed down or halted through the application of the guidelines of the Regional Landscape Plan (2006), which commits local policy makers to "prohibit transformations for purposes

and uses different from the original agricultural ones, unless public economic and social importance is demonstrated, as well as the impossibility of finding an alternative location; and transformations impacting soils with high use-capacity, or especially valuable agrarian landscapes, or habitats of naturalistic interest".

25.2 Peri-urban Olive Groves of Monte Oro (40° 43′ 34.16″ N; 8° 30′ 34.74″ E)

The olive-growing area of Monte Oro lies within the municipality of Sassari. It extends over ca. 1,000 ha at altitudes between 75 and 230 m a.s.l. The land is mainly privately owned. The area can be reached from Sassari by taking SS 291 westward, exiting onto the old SS 291 (two lane) after 3 km, and then taking Strada Vicinale Monte Oro, which runs through the olive groves. The area lies immediately west of the town of Sassari, in the middle of a Miocenic limestone plain in northwest Sardinia. Here, among arenaceous and marly limestone rocks covered with traditional olive groves, are outcrops of volcanic rocks (rhyolites, rhyodacites and andesites) whose reddish color stands out against the light-colored limestone. The shallow to mid-deep soil is permeable and erosion prone, with a reaction ranging from neutral to sub-alkaline. Its carbon content is high, that of organic matter average, and its base complex is saturated, with an average cationic exchange capacity.

The local landscape owes its significance to the persistence of vast, ancient olive groves on the outskirts of a middle-sized town. It thus belongs among those agricultural areas labeled "urban nodes" (*poli urbani*) in the national rural development plan to highlight the special importance of cultivated areas in the proximity of towns. Ever since 1500, the Sassari olive-growing area was regarded as especially important. In the 1700s, the area already had a highly homogeneous system of olive groves extending from the Quaternary aeolian deposits of the pre-littoral strip of the bay of Asinara in the north to the limestone plateau around Sassari, and from here further south to Ittiri. Beyond Ittiri, the olive-growing landscape reappears on the volcanic slopes inland from Alghero, to end at the aeolian deposits along the coast. These historical olive groves thus form a corridor with specific ecological functions connecting the protected area of the bay of Asinara to that of Capo Caccia—Porto Conte. The surrounding countryside has undergone deep and rapid changes, such as the strong reduction of vineyards, devastated by phylloxera and replaced by olive groves at the end of the nineteenth century, or the later abandonment of arables, replaced by pastures. Maps of the area drawn up by the Fourth Infantry Regiment of the Sardinian-Piedmontese army in 1857 bear witness to the impact of olive-growing on the rural landscape of Sassari. This impact was also remarked by the ethnographer Paolo Mantegazza (1869), who, coming into Sassari, was impressed by the extension and quality of the crop: "You go down a mountain all covered with magnificent olive trees, cultivated with the same care and tenderness with which you cultivate a city vegetable garden". Mantegazza also stressed the importance of olive-growing for the town's economy: "I became further aware of this wealth as I went into Sassari, where many new houses were being erected, and they were olives transformed into walls

and marble". In the late 1930s one could still discern the traditional agricultural division of the land into three concentric strips: olive trees, olive trees associated with grapevine, grapevine. As a rule, olive trees are not found in the many catchment basins draining into the elaborate local torrent network, on whose fertile soil high-yield vegetable crops are grown instead. The olive-groves, mostly of the local *Bosana* variety, are preferably grown on shallow soil. They yield an oil designated as "Sardegna" that has earned PDO (Protected Designation of Origin) recognition.

The area under consideration here is only a small part of the olive-growing system of the Sassari countryside, which extends over 4,500 ha, although not continuously, having been vastly compromised by urban expansion. In areas where the city has not encroached over farmland, a scattered settlement pattern still prevails. Here the olive groves are preserved and in the largest estates, at least, they still retain their productive function and receive the traditional care and maintenance. The protection of the olive-growing landscape is one of the objectives of the Regional Landscape Plan, which provides for the preservation both of the specialized tree-growing and of peri-urban agriculture.

The principal vulnerability factor of the Sassari peri-urban landscape is the city's expansion, which began in the second half of the twentieth century due to demographic growth. The fact that the olive-grove area began right outside the city has led to the loss of the part nearest to it, with patches surviving here and there only as urban decoration. The extension of the road network, with the joining of SS 291 to SS 131, has also eroded part of the traditional landscape. One of the indirect effects of urban expansion in the countryside was the closing down of cooperatively managed processing facilities in Sassari. The processing of Bosana olives, however, is continuing thanks to the appearance of small and middle-sized producers specializing in the production and bottling of the "intensely fruited" oil yielded by this variety. Should its productive usefulness further decline or come to an end altogether, the fringe area between the city and the countryside should still be protected for its landscape, historical and environmental importance. An "environmental city" is one that connects with its countryside and strives for an integrated development of local resources, recognizing the value of urban forests as historical testimonies surviving within the new land-use systems as landscape elements attenuating the "biological desertification" caused by urban expansion (Fig. 25.1).

25.3 Rural Landscapes of Asinara (41° 04′ 21″ N; 8° 16′ 43″ E)

This area includes the rural landscapes of the island of Asinara, which extend over ca. 3,000 ha in the municipality of Porto Torres, province of Sassari, at the northwest extremity of Sardinia. Since 2000 the area has been owned by the Sardinia region, except for small surfaces within settlements. The island is included in the Asinara National Park and the "Isola Asinara" SCI (Sites of Community Importance) and SPA (Special Protection Area). It is reachable from the Port of Stintino in 15–20 min, to the southern mooring spot of Fornelli, or from Porto Torres to Cala Reale midway

Fig. 25.1 Ever since 1550, the Sassari olive-growing area was regarded as especially important. In the following centuries it expanded into a vast landscape system

along the east coast of the island, in 90 min. Asinara is a natural extension of the "Paleozoic Nurra" of northwest Sardinia. It is constituted of originally sedimentary and volcanic rocks, gneiss and mica schist that metamorphosed at the end of the Paleozoic era. Granite intrusions come to the surface amidst the prevailing metamorphic rock especially in the south part of the island, but some small patches are also visible along the northern coast. The soils are superficial and sub-acid, with a texture ranging from loamy to sandy.

Asinara's rural landscape owes its significance to a very peculiar combination of factors: on the one hand to the island's natural beauty, on the other how it was shaped by anthropic action, namely, the activities of the local agricultural penal colony. Until the end of the nineteenth century, Asinara was inhabited by Sardinian shepherds and Ligurian fishermen originally from Camogli. In 1842 it was incorporated in the recently instituted Commune of Porto Torres. Under Royal Decree no. 3183 of 1885, issued by King Umberto I, the island's land was expropriated for the establishment of an agricultural penal colony and a maritime quarantine station. The five hundred inhabitants of Asinara were forcibly moved out and access to the island was interdicted. Asinara remained off limits to the public from 1885 to 1999. Its total isolation was reinforced in the early 1960s, when a top security prison was established here. The present landscape, therefore, is the result of the activity of the agricultural penal colony, which existed until the year 2000. Level areas were tilled and hill slopes used for grazing livestock. Systematic recourse to fire modeled the landscape, and determined the characteristics of the vegetation and the soil. The most

interesting area on Asinara, which lies north of the Stretti isthmus, still shows evident signs of the local environment's agrarian transformation: about 55 ha of arables for the production of fodder at Campu Perdu, and about 20 of vegetable gardens and orchards between Trabuccato and Cala d'Oliva. The principal activity of the island was livestock farming, as borne out by the presence of an irrigation network to allow the growing of hay in the summer and of certain vegetables. The arables are still divided into regular plots separated by windbreakers and dry-stone walls. The Trabuccato area (15 ha) housed the vineyards and cellar, which today is in precarious conditions. Vestiges of the layout of these vineyards are still evident; notably some leftover almond, fig and myoporum, relics of the windbreakers that delimited the plots. At the entrance of the town of Cala d'Oliva one encounters an agricultural area about 6 ha in extension, with terraced surfaces once occupied by vegetable gardens and orchards. Near the Case Bianche (the "White Houses") one can distinctly see the arrangement of the land in wide terraces along a scarp. This mosaic of small intensive agricultural patches bears witness, on the one hand, to the earlier local population's need to maintain food self-sufficiency, on the other, to ample availability of zero-cost labor.

The landscape still retains a good degree of integrity. Its appearance is more agricultural than natural, due to the intense use the land has undergone over the centuries. Even where livestock farming has now ceased, secondary plant communities have replaced potential natural vegetation, a consequence of the penal colony's use of fire, grazing, and intensive and extensive agriculture. The main risk today is that the area's state of abandon will lead to a gradual decline or disappearance of the area's distinctive features. Hypergrazing favored the spread of unpalatable species such as tree spurge (*euphorbia arborea*), which has penetrated many urban and rural sites on the island, where it often provides the dominant landscape color. In the island's plains, the agrarian landscape is regular and essential. It is arranged in orthogonal divisions with purely functional purposes, whose perimeter is still marked by delimiting structures, including myoporum hedges, dry-stone walls or mesh fences. In some places important agrarian modifications have been carried out, as in the case of the still well-preserved terraces of Cala d'Oliva and Case Bianche, or the artificial basins built to increase water resources for civil and agricultural uses at Campu Perdu and Cala d'Oliva.

The area's vulnerability is essentially a consequence of the abandonment of farming. The closing down of the prison determined an abrupt interruption of agricultural activities, with the consequent beginning of a number of changes in the landscape. Domestic animals, no longer controlled by man, have scattered all over the island in search of space and food. In the absence of culling, their populations have quickly increased, causing serious damage to the local vegetation and fauna, and even to manmade structures. It is pigs and goats that have been found to be mainly responsible for the damage. The main risk for the area is losing its historical and cultural character, as it was shaped by a subsistence agriculture for the needs of local human settlements. Having no resident inhabitants, the island suffers from a serious lack of services, as regards transportation by sea and land, refreshments, and shade. Above all, there is nobody to carry on farming activities (Fig. 25.2).

Fig. 25.2 The Asinara landscape owes its significance to the island's natural beauty and the activities of the local agricultural penal colony

25.4 Planted Silvo-pastoral Systems of Monte Minerva (40° 26′ 00″ N; 8° 34′ 00″ E)

The agro-silvo-pastoral landscape of Monte Minerva extends over ca. 1,000 ha within the municipalities of Villanova Monteleone, Padria, and Monteleone Rocca Doria, in the province of Sassari. Its altitude ranges between 150 and 500 m a.s.l. It is included in the "Entroterra e zona costiera" SCI (Sites of Community Importance), which encompasses the area between Bosa, Capo Marargiu and Porto Tangone; in a permanent regional oasis for bird protection and capture; and in a Bioitaly Site created to protect the most numerous Italian colony of griffon vultures. It is also under landscape restrictions as per Law 431/85. The mostly privately owned area can be reached from Alghero by SS 292 through Villanova Monteleone to Monteleone Rocca Doria. The SS 292 runs through the northern part of the area. Monte Minerva is the geological residue of a once more extensive volcanic plateau composed of rhyolites and pyroclastites, whose contour is now eroded. The town of Monteleone Rocca Doria is built on a limestone and sandstone rise. Part of the area has a gentle morphology with wide valleys, whereas the slopes of Mount Minerva are rather steep.

The area owes its significance to the fact that its landscape is still strongly marked by the agro-silvo-pastoral activities around which the local economy revolved for many centuries, until a few decades ago. It is characterized by vast treed pastures with a prevalence of Gramineae, surrounded with evergreen pistache groves and

interspersed with cork and downy oak. The downy oaks still retain the shape they were given by traditional pollarding (*a capitozza* pruning) for fodder, a practice once widespread in the island and all over the Italian peninsula. The first testimonies of human presence in these areas are prehistoric and nuragic settlements, followed by Punic and Roman ones. Near the area is the large Nuraghe Appiu complex (municipality of Villanova Monteleone) and a Punic center with metalworking shops at Sa Tanca 'e Mura (municipality of Monteleone Rocca Doria), which once belonged to the Giudicato of Logudoro and the Curatoria of Nurcàra. On a small rise between Monte Minerva and Rocca Doria is another large nuraghe (Nuraghe Mannu). The Roman road that ran along the western coast of Sardinia from Bosa to Carbia—a settlement believed to have lain in the countryside of present-day Alghero—skirted the "latifundium of Monte Minerva", which apparently dates all the way back to Roman times. This was later an aristocratic hunting estate, also frequented by the Savoia family. Due to its orographic features, this area, like many areas in the interior of Sardinia, was long isolated and economically and socially marginalized, its production not rising above subsistence level. The selected area differs from the surrounding landscape, among other things, for the presence of pollarded downy oaks. The trees are sparse, isolated or in small groups. Their sizes vary, but they are prevalently large. The result is a typical treed-pasture landscape. Closer to the bottom of valleys, the trees are scattered around pastures crowned with maquis, whereas further up along slopes shrubs have almost totally colonized the land, invading pastures. Here the pollarded downy oaks bear witness to a long persistence of a cultivation system centered around animal husbandry. Pollarding involves cutting the trunk not flush to the ground, but about two meters from the ground. This "aerial" coppicing favors the production of branches and leaves. Pollarding allows the renewal of foliage by protecting it from the bites of grazing animals. Besides fresh forage, it also yields some firewood and, on occurrence, leafy branches for the roofing of the traditional local shelters known as *pinnettas*. Repeated pollarding models trees in a distinctive, sometimes striking way. The trunk gradually takes on a massive, column-like shape, while the branches are comparatively thin. These pollarded trees put a strong stamp on the local landscape.

The integrity of the area depends mainly on an adequate presence of animal raising and grazing. Animal husbandry is still practiced in valley bottoms. Notably, there are some reputed horse farms here, where the animals are in part fed by grazing. Here the effects of pollarding are still clearly recognizable in trees above a certain size, although the practice fell into disuse over a decade ago. There are ongoing attempts to promote the area's landscape to attract tourists, with special emphasis on the woods of downy oaks and centuries-old holm oaks, inhabited by typical mountain forest animal species. The Regional Landscape Plan has set down development guidelines for the environmental improvement of the local infrastructure to facilitate resource use in this area, which stands out in Sardinia for its exceptional landscape value.

The main threat to the local landscape is the abandonment of traditional practices, and especially that of pollarding. As long as trees pollarded in the past remain vital, their foliage will retain its characteristic appearance, but this will be less and less recognizable as time goes by. Furthermore, as one can observe along the middle versant of Mount Minerva, as animal husbandry declines pastures are invaded by

Fig. 25.3 The agro-silvopastoral landscape of Monte Minerva is a typical Sardinian landscape

shrubs, and this detracts from the significance of the landscape. Another element of vulnerability is the spread of a negative attitude to pastoral landscapes strewn with scattered shrubs and trees; these should be regarded, instead, as one of the strongest manifestations of the historical identity of the Sardinian landscape and its peculiar biodiversity (Fig. 25.3).

25.5 The Cork Oak Woods of Gallura (41° 02′ 29″ N; 9° 07′ 58″ E)

The cork woods of Gallura lie within the municipalities of Aglientu and Luogosanto, in the province of Olbia-Tempio. They extend over an area of ca. 1,200 ha at altitudes between 230 and 480 m a.s.l. The land is privately owned, some of it being placed under restrictions by the terms of Laws 1497/39 and 431/85. The area can be reached from Tempio Pausania by the SS 133, turning left shortly before Luogosanto onto the SP 5, direction Aglientu. The SP 5 marks the northern boundary of the area. To drive into the area one needs to take a side road after 6.2 km.

The substratum is formed of leucogranites and monzogranites of the Ercinico intrusive complex. The soils have textures ranging from sandy loam to loamy sand, and are usually shallow, attaining depths over 50 cm only in the colluvial-alluvial part of the area. The morphology of the hills is craggy in places.

The cork woods of Gallura owe their significance to the persistence of a historical silvo-pastoral activity manifested in a landscape characterized by woodland pastures, stone man-made structures, and a tree species that is typical of Sardinia. The area is part of a vast district that extends over almost all of the Sardinian northeast granite block. The landscape of this district is dominated by pure or mixed cork woods interspersed with meadows and treed pastures. The cork woods are rather stable and composed of coeval clusters as a result of periodic cutting to allow wood renewal. About one fifth of the selected area is occupied by autumn and spring forage fields, subdivided into plots. The rest is covered by an evergreen cork and holm oak forest associated with typical maquis underbrush. The forest's present structure is the result of the spatial and temporal patterns of its use. The undercover cultivation of grain has given rise to sparse woods of coetaneous cork trees with small diameters, or a dense maquis where the tillage of the soil also involved stump removal. Cattle grazing, instead, has led to the formation of woods of old, coetaneous cork oaks. The landscape is thus largely shaped by local farming practices. Summer fires, instead, have led to the formation of cork and holm oak coppices. Usually agro-forestal management systems do not involve an optimization of forests, their focus being the maximization of livestock yields. This is not the case, however, in upper Gallura, where the cork woods the most important source of income for local businesses. Throughout history, the agricultural economy of Gallura was based on scattered, self-sufficient productive units called *stazzi*. These farming and pastoral buildings of Corsican origin were established in the late eighteenth century. They are elongated and built of local stone. Over time they have expanded to accommodate the needs of growing families. The cork forests around *stazzi* have always been an integral part of an agro-silvo-pastoral economic system that is especially well represented in this area.

The local landscape boasts a high degree of integrity. The cork woods are well preserved, especially thanks to their importance in the local economy, which is borne out by the low impact of summer fires on them. Although the provincial road runs along the edge of the area, interrupting the continuity of the landscape, this kind of problem does not occur within the area itself, which is only crossed by some tracks. The present landscape owes its integrity, in part, to the grazing of beef cattle, originally of a local breed, but now crossed with Charolais or Limousine bulls, which are still kept roaming free within forest areas.

In spite of all this, there are some elements of vulnerability, mainly determined by the general crisis that has recently struck the animal husbandry sector. The coexistence of animal husbandry and the cork industry has allowed the hillside businesses of Gallura to attenuate the effects of the crisis of bovine husbandry engendered by sanitary preoccupations and the consequent blocking of traditional exports of calves towards fattening centers on mainland Italy. The cork market, however, also seems to be going through a crisis induced by the spread of alternative and cheaper materials for stoppers and containers, since bottle stoppers for wine-making companies account for 70–80 % of the income from the cork forest. Finally, cork forests are going through the same habitat modifications as other forests: fragmentation, reduction and stress. In reality, two or more of these processes occur at the same time, making them difficult do distinguish (Fig. 25.4).

Fig. 25.4 The cork production and environmental features of the Gallura contribute to the creation of a unique rural landscape

25.6 Traditional Vineyards of Mandrolisai (40° 00′ 01.77″ N; 9° 04′ 06.28″ E)

This privately owned wine-growing area is located in the province of Nuoro, in the northern part of the municipality of Atzara, except for a very small portion in the municipality of Sorgono. It extends over ca. 400 ha with altitudes between 480 and 800 m a.s.l. Atzara is on the SS 128. The traditional vineyard area can be reached by the SP 61, which runs from the town center of Atzara into the area's southern part. The area lies in the middle of Sardinia, west of the Gennargentu massif, in a landscape of rounded hills of granite of varying texture. Its sandy and sub-acid soils range from shallow to medium deep, and have low water retention capacity. As regards its geology, the area extends over a vast plateau of granites and granodiorites.

The area owes its significance to the historical persistence of a very ancient viticultural tradition, resulting in a landscape dominated by small bush vineyards. In the Mandrolisai, wine growing has remote origins. Today it lives on mainly in the communes of Ortueri, Sorgono, Atzara and Meana Sardo, in a district of about 1,000 ha. The traditional wine-growing system is based on the dry cultivation of small vineyards, 80 % of which employing the bush vine (*alberello*) system, while in the rest the vines are trained on low espaliers. In the course of history, bush vine cultivation, of Greek and Phoenician origin, has been typical of southern Italy, while the north and central Etruscan method involves training vines onto trees (*vite maritata*)—a contrast reflecting differences in soil and climate. These different methods have given rise

Fig. 25.5 The low tree vine cultivation, of Greek and Phoenician origin, is a historical feature of the Mandrolisai landscape

to markedly different landscapes. In the selected area, plots are bounded by strips of shrubs or trees typical of the evergreen-pistache and olivastro-dominated maquis. The result is an elaborate mosaic of fields hemmed by hedges and rows of trees. Here the traditional economy displays a high degree of ecological connectivity, having developed multiple ecosystemic and environmental functions. The smallness of the vineyards and the presence in them of fruit trees, and sometimes small vegetable gardens as well, reflects their family-owned character. Over the last 20 years, mainly as a result of the European Community reform of the wine market to limit structural excesses in production, the explanting of vineyards and failure to update productive and processing structures have led to a strong reduction of the wine-growing surface, which is presently down to ca. 1,000 ha, far below the area's capacity. The wine produced in the area is included in the "Mandrolisai" DOC (Controlled Origin Denomination), a denomination instituted by a decree of 6 June 1981. It is a blend of three grape varieties: Monica, Bovale and Cannonau.

In the selected area, the landscape mosaic appears quite intact and production still retains its traditional character. The road system is not invasive; actually, the area suffers from isolation due to insufficient roads. As in all hill areas, local viticulture is plagued by high production and transportation costs that are not covered by the sale price of the product. The local rural economy appears to be quite static, in spite of the strong decrease of vineyard surface. This is partly a consequence of the maintaining of the traditional bush vine cultivation, as well as scarce mechanization. Besides the three above-mentioned vintages, other, less abundant varieties of grapes are grown in the area, making it a reservoir of genetic resources.

Various factors contribute to the vulnerability of the area. Besides the reduction of vineyards, there is a trend to use pure Bovale vintage grapes to produce wines with a more intense color, to the detriment of the traditional "Mandrolisai" wine production. The balancing of supply and demand by EC policy, support to typical and niche productions, and the development of agrotourism, while they may help to sustain a modernization process and increase local farming businesses' income, may, however, also favor the spread of counter-espaliers in replacement of the traditional bush vine. The emergence of small producers-bottlers has weakened the position of the Sorgono wine growers' cooperative, which until recently had managed all the grapes in the area, although in a context of gradual senescence of agriculture and rural exodus. Besides, there is a total lack of innovation in the fields of phytosanitary protection and mechanization. The building of new fast roads, although so far still limited, while improving connections with the faster developing littoral strip, may further reduce the surfaces occupied by the vineyards. All these factors, over time, could lead to a further reduction of the wine-growing surface and, in the worst hypothesis, to the loss of DOC recognition for the local wine (Figs. 25.5, 25.6).

Land use 2007	Surface (ha)	Surface (%)
Citrus orchard	451.80	57.02
Terraced citrus orchard	89.04	11.24
Hedge and tree rows	4.10	0.52
Shrubland	19.32	2.44
Terraced shrubland	1.92	0.24
Urban area and courtyard	106.07	13.39
Bare rock	15.58	1.97
Abandoned citrus orchard	26.69	3.37
Abandoned terraced citrus orchard	4.43	0.56
Mixed forest	9.17	1.16
Terraced mixed forest	1.54	0.19
Fallow	37.72	4.76
Terraced fallow	4.18	0.53
Unclassified	1.52	0.19
Olive grove	0.84	0.11
Meadow	0.07	0.01
Vegetable garden	3.97	0.50
Road system	1.29	0.16
Greenhouse	1.41	0.18
Arable land	11.72	1.48
Total	792.38	100.00

Evaluating indices of landscape	
Number of land uses	20
Number of patches	1,683
Total surface area (ha)	792.38
Average surface area of patches (ha)	0.47
Average surface area of arable landpatches (ha)	0.47
Hill's diversity number	4.73
Class of landscape integrity (I–VI)	V

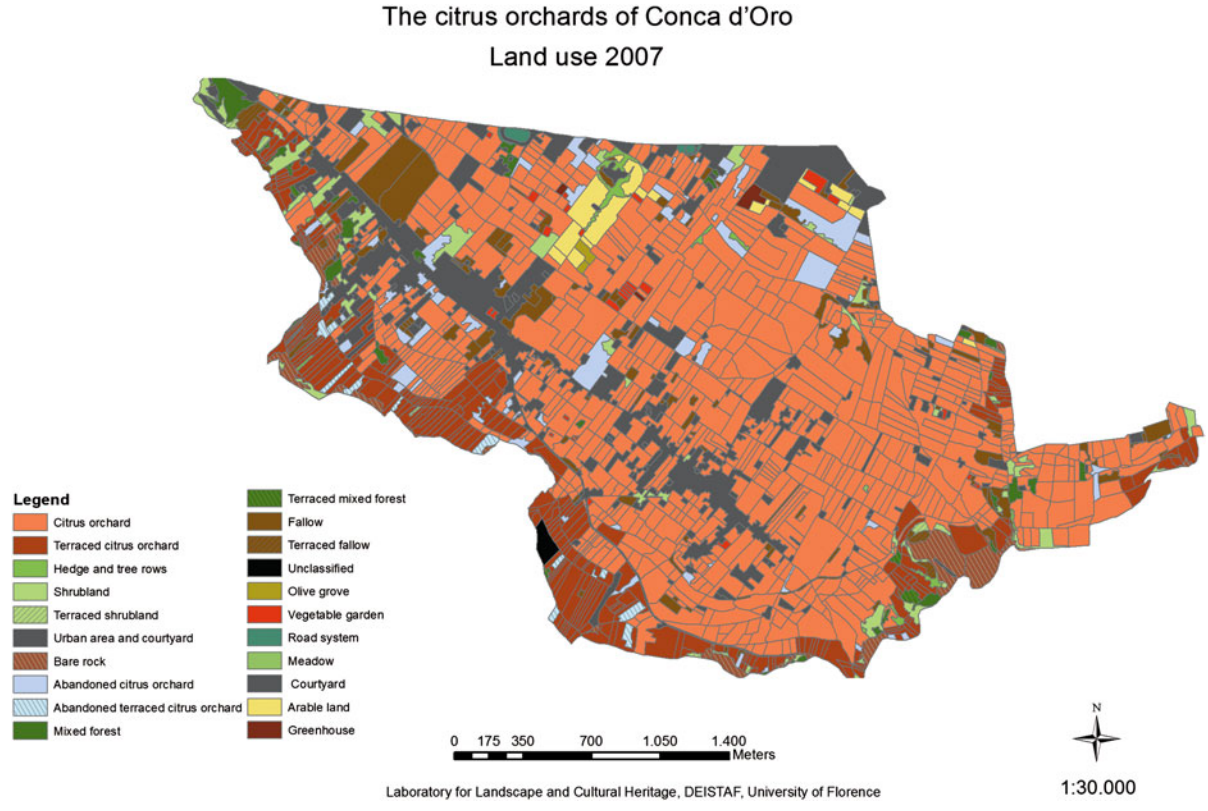

Fig. 25.6 The landscape of the Conca d'Oro is characterized by citrus orchards, whose beauty was described also by Wolfgang Goethe and Fernand Braudel. Today citrus is mostly cultivated in the plains (60.4 % of the study area) and to a lesser extent (11.8 %) on the terraces. Of all the citrus present, around 5.4 % shows widespread abandonment. The landscape is highly fragmented (1,683 patches over 792 ha) into a regular grid of small plots and has a high level of integrity and biodiversity. In the last 50 years abandonment has affected the citrus groves located on terraces, to this we need to add the growing pressure of urban expansion (+400 %), often illegal, which threatens to irreversibly alter the qualities of this historical landscape

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