

Article

# Peri-Urban Matters. Changing Olive Growing Patterns in Central Italy

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**Abstract:** For centuries, olive growing has played a major role in the central regions of Italy, with hectares of olive groves surrounding hill towns and hamlets as part of a strong deep-rooted farming tradition. With reference to Lazio and Abruzzo, this article makes use of historical documentation, geographical surveys and in-depth interviews with professionals and experts, in order to provide evidence of how olive growing, once of the mixed type, now with specialized cultivations, has somehow challenged the structural features of traditional landscapes. In some cases, this ancient farming tradition has been awarded the 'Protected Designation of Origin Brand' according to strict technical production policies. Besides intensive crops, today also practiced on flat ground, for some years now, olive trees have been cultivated by 'hobby farmers'. This is frequent in fringe areas, threatened by urban sprawl, within small plots belonging to detached family homes conferring a sense of rural 'revival'. Whether all these diverse settlement patterns are socially and economically sustainable is debatable. Definitely, such persistence in land use, which now and again can be read even as a material survival of certain tree specimens, allows for olive farming as an enduring cultural practice in the face of increasing urbanization.

**Keywords:** olive growing; peri-urban areas; rural areas; sustainability; central Italy; tradition/innovation; olive oil economies; landscape patterns

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## 1. Introduction

In central Italy, olive landscapes stand as a major result of long-term relationships between communities and their elective space in terms of possession, use, control and exploitation of local resources.

The aim of this article is to assess how and to what extent new practices in olive growing, urged by different driving forces, such as demographic dynamics, urban development and market-oriented behaviors, are challenging landscape characters either in specialized cultivations in rural areas or in residual plots within the urban fringe.

All over the Mediterranean basin, olive growing is associated to peculiar rural landscapes and economies somehow unified by highly symbolic values conveyed by the olive tree, which is now recognized as the universal symbol of peace and prosperity, being rustic, domestic, durable and useful (Braudel, 2002) [1]: "The Mediterranean Sea runs from the first olive tree one encounters when coming from the North to the first palm groves that appear with the desert" (p. 19). For the Greek geographer, Herodotus (fifth century BC), those lands where figs, grapes and especially the olive tree were not grown could not be considered Mediterranean.

The olive tree plays a fundamental role in the construction of images and the imaginary of the countries overlooking the Mediterranean Sea and in the liturgy of the three monotheistic religions

born in the Middle East. Myths, rites and traditions have been constructed around it (such as the olive tree planted by the goddess Athena on the Acropolis protecting the city that carries her name).

Olive farming provides manifold associations between a solid culinary and gastronomic tradition and the diverse landscapes dominated by the tree, present in sparse, scattered or designed cultivations (Figure 1).



**Figure 1.** Surviving olives (Sabina, Lazio. Credits: Anna Laura Palazzo).

Olive oil is an essential ingredient of the Mediterranean diet, the first dietary pattern in the world to be included in 2013 in the prestigious list of intangible cultural heritage. Such connections among food, nutritional properties and landscapes are witnessed by a large variety of cultivars, agricultural practices, types of food chain and market outlets.

The conceptual framework is provided by a broad strand of research fostered by interdisciplinary studies acknowledging tangible and intangible heritage values and emphasizing still effective traditional landscape features within current farming systems [2,3]. These cases can be defined as ‘culture at work’, with culture being the fourth pillar of sustainability [4]. As stressed by the *Convention for the Safeguarding of the Intangible Cultural Heritage* passed by the UNESCO General Conference held in 2003 [5], “This intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity” (art. 2).

According to the *Framework Convention on the Value of Cultural Heritage for Society* held in 2006 (Faro Convention, Council of Europe, STCE n. 199/2006) [6], culture is a cornerstone of future policy, with a positive awareness raising impact among a range of communities.

As a matter of fact, the inherent cultural aspects within European and Italian landscapes—practices, representations, expressions, knowledge, skills—have been stated by seminal works of Pierre George, Henri Desplanques, Emilio Sereni, Lucio Gambi and Leonardo Rombai, whose essays helped to pave the way for promising research in ‘Historical geography’ [7–11]. Recent investigation in the field of ‘Landscape agronomy’ has been providing further perspectives, setting up the fundamentals for models of agricultural dynamics intertwining farming practices, landscape patterns and natural resources [12,13].

In Lazio and Abruzzo regions, olive growing displays a striking geographical correspondence between Protected Designation of Origin (PDO) production areas within a range of urban centers (Reg. CE 1263/96) and the main monastic estates dating from the first Millennium. This has been the

very case of the powerful Abbey of *Farfa* erected in the seventh century along the *Salaria* Consular Road 35 miles north of Rome, which falls within the boundaries of PDO production area Sabina. In Abruzzo, the Cistercian Abbey of *San Clemente a Casauria* (ninth century) and the Benedictine Monastery of *Santa Maria in Piano* in *Loreto Aprutino* (ninth century), fall within the boundaries of PDO *Aprutino-Pescarese* (in the province of Pescara). The Benedictine Abbey of *Santa Maria di Propezzano* in *Morro d'Oro* (eighth century) is located within the boundaries of PDO *Pretuziano delle Colline Teramane* (Teramo), whereas the Benedictine Monastery of *San Giovanni in Venere* (sixth century), on the coast in the southern part of Abruzzo, falls within the boundaries of PDO *Colline Teatine* (Chieti).

However, after WWII, the results of farm mechanization and the dictates of productivity and profitability affected the traditional landscapes with a standardization and simplification of cropping systems, mainly in lowlands: an 'insurgent disruption' giving rise to 'operational landscapes' as a result of exploitation and business models borrowed from the industrial sector [14]. Conversely, in steep slope areas, where manual labour is lacking due to intense migration phenomena, the abandonment of wood crops may provoke hydrogeological instability. In the middle, place-based production chains of high-quality olive oil hold on with increasing difficulties in delivering small stocks to niche markets. Olive agriculture stays as a main feature even in the fringe areas, where besides professional farming, for some years now, olive trees have been cultivated by 'hobby farmers' for self-consumption within small plots retaining a sense of rural revival (Figure 2).

In the next Sections, beside presenting the methods and results of the research, possible trends in the binomial tradition/innovation within olive landscapes and economies are discussed, and considerations are provided on new perspectives framing peri-urban areas as a privileged place possessing the positive features of both the urban and the rural, which the solid physiognomy of the olive tree helps perpetuate. A glance at the international scene allows us to maintain that such extensive use of ever larger commuting areas, triggered by widespread private mobility, compels one to reconsider rurality in the sphere of 'everyday landscapes' as a stabilizing factor in the precarious balance between man and nature.



**Figure 2.** Cultivation mosaic in a peri-urban area (Tivoli, Lazio. Credits: Anna Laura Palazzo).

## 2. Materials and Methods

The analysis of the contexts and processes involved in olive growing (Section 3. **Results**) has been carried out using qualitative and quantitative methodologies, organized in three different strands:

(i) Long-standing olive growing practice in central Italy, due primarily to eating habits and farming systems, and subsequently to state regulations that helped forge the structural features of hilly landscapes within countless variations of local cultivars (*Stories. Putting down roots*). As for Lazio, belonging to the Papal States until 1870, the survey has examined documents both from public and private archives, land use maps (notably, the Catasto Gregoriano dating back to 1819) and memoirs of scholars and papal officials. For Abruzzo, more lacking in iconographic sources, the papers essentially relate to legislative measures taken by the Kingdom of Naples. Following the Unification of Italy (1861), the main sources are institutional reports, surveys and statistics delivered with a periodicity of 10 years (Italian Statistical Yearbooks by the Ministry of Agriculture, Industry and Commerce—Directorate of Statistics).

(ii) The state-of-the-art in current olive farming features in both regions, with a major focus on the territories falling within Protected Designation of Origin production areas (*Geographies, economies and consolidated landscapes*). The investigation makes use of statistical data taken from the General Census of Agriculture—5th and 6th ISTAT Census (2000 and 2010), from the calculations provided by ISMEA (Institute of Services for the Agricultural and Food Market) and by CREA (Council for Research in Agriculture and Analysis of Agrarian Economy). All such sources of information have been integrated by in-depth interviews with professionals, experts and farmers, performed in order to confront direct local feedbacks with the quantitative data set.

(iii) Likely scenarios related to new dwelling habits merging ‘farming’ and ‘country home’ typologies in rural and peri-urban areas (*Ongoing processes and possible scenarios*), inferred from previous results and from nationwide trends in olive growing deriving from statistical data. A synthetic focus on the PDO production area ‘Sabina’ provides additional considerations leveraging on thematic mapping (Corine Land Cover Nomenclature 4th and 5th level, scale 1:25,000).

### 3. Results

#### 3.1. *Stories. Putting Down Roots*

Olive growing widely developed in Italy between the Fourth and Third Centuries BC, gradually extending from the southern areas to the North, especially in hilly areas where the climate and soil were more favorable to its development [15].

In the early Middle Ages, monastic orders (the Benedictines) settled in central Italy and shaped huge estates, trying different species and improving yields [16].

Protectionist measures adopted by Rome encouraged farming and processing practices, which are testified by the spread of the *trapetum*, the olive press [17].

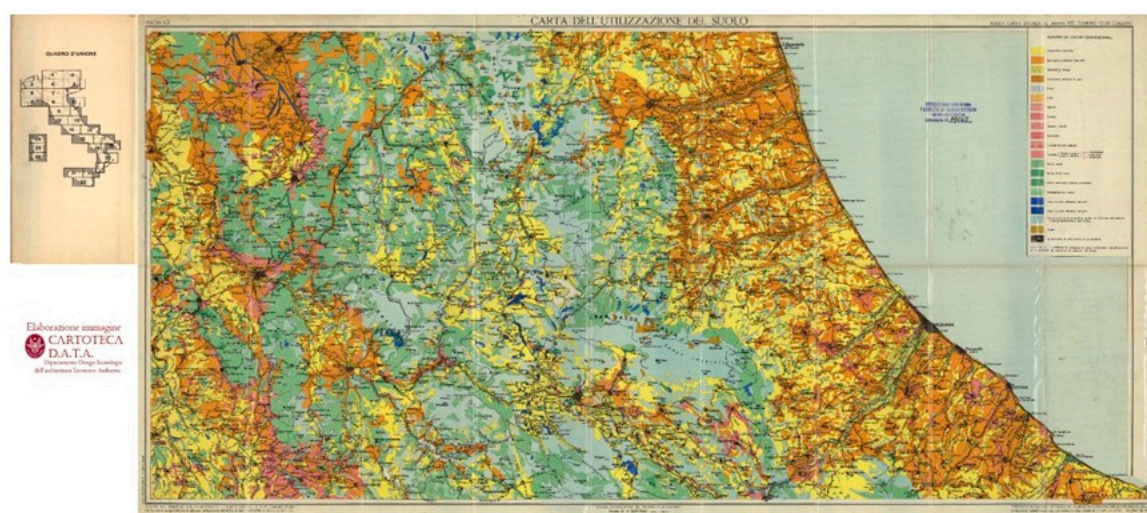
In the Latin world, the olive tree and olive growing are frequently mentioned by agronomists, poets and writers. In his *Naturalis Historia*, Pliny the Elder includes the *regia di Sabina* (Lazio) among the 14 varieties of olives grown in Italy; Virgilio mentions the presence of the olive in the *Marsica* (Abruzzo), while Ovid discusses the production of olive oil in *Valle Peligna* (Abruzzo) confirming the practice as well-established [18].

From the fourth century AD onwards, olive cultivation began to decline. The Empire, with the extension of its operational, political and economic boundaries, was compelled to buy oil for its own consumption from the regions of the eastern Mediterranean and from Greece [19,20]. The subsequent domination of the Arabs in the southern part of the Peninsula encouraged the cultivation of fruit trees, especially citrus fruits, hindering that of grapes (for religious reasons) and olives so as to protect the considerable production of oil from their areas of origin.

Renewal and revitalization of agriculture were made possible thanks to the work of the Benedictine and Cistercian monks, who oversaw land earmarked for new trials, planting the main groves: a solid olive farming activity enhanced by varietal selection took place in the hilly areas, with extensive land reclamation and strengthening of slopes [21].

Political stability prolonged the cultivating momentum of the first Millennium and promoted agriculture around the *Castella* and *Poggi* established in the Middle Ages. These were all one with their territories of origin, the *contadi*, and boasted concentric olive groves of mixed cultivations between the first strip of vegetables and vines and the arable fields further from inhabited areas. The *contado* (from the Latin *comitatus*, that is ‘county’, the land entrusted to the administration of a *comes*, a count) was the area over which the Medieval city wielded its power. Here, the land features were terraces (*terrazzamenti*) and embankments (*cigionamenti*), shelves respectively supported by dry-stone walls or embankments of earth, which also extended over time to the hills some distance from the cities with the new demand for ‘land’ to grow crops on [22].

These patterns have long been preserved: for Italy’s peninsular areas, the *Charter of land use* (1960) shows persisting land uses around historical hill settlements, where polycultures once dominated (Figure 3), and vineyards and olive groves used to be grown together (‘married’ vines). Besides playing a stabilizing role against landslides in steep terrains, such practice allowed vines to lean permanently against the olive trees acting as living stakes.



**Figure 3.** Charter of land use in Italy, 1960. Scale 1:200,000. Credits: Touring Club Italiano, Consiglio Nazionale delle Ricerche.

Crop expansion came to a halt around the end of the sixteenth century due to a prolonged period of cooling (Little Ice Age), after which landscapes were radically transformed: on the coast, olive trees replaced the citrus groves, while at a higher altitude (500–600 m) they underwent significant reductions in favor of almond and apple trees [23]. Severe frosts in the eighteenth century (after the ruinous and generalized ones of 1709, 1740, 1789 and 1798), along with the negligence of the landowners, caused a massive impoverishment of rural living conditions. In the replanting process, from mid-Eighteen to mid-nineteenth century, a major role was played by institutional initiatives with long-term results and widespread benefits, notably the regulations enacted by pre-Unitarian States such as the Papal States—for Lazio, Umbria, Marches and part of Emilia-Romagna—and the Kingdom of Naples—for Abruzzo and Molise, Campania, Calabria, Basilicata and Puglia.

In the first phase—*restoration and expansion*—olive growing was confirmed as an ‘accompanying’ cultivation providing extra income. In marginal foothill areas or higher slopes most difficult to maintain, olives also performed the task of holding the soil in place on the inclines and combating landslides. Where the gradient allowed it, the land was used for sowing crops, and olive trees could also perform the task of supporting the rows of vines.

In this epoch of recolonization and dissemination of the olive, the public sector supported interventions with incentives and reforms reshaping land ownership and helping establish crop

variation within significant portions of territories [24]. Geographies were specified and rural landscapes redesigned; these were very diverse, not only for the multiplicity of the areas concerned (morphologies and latitudes), but also for the variety of approaches and density of planting.

As an example, with reference to the *Department of the Tiber*, which included during the years of French occupation (1809–1814), a large region around Rome with the greatest olive growing areas in Lazio, the Prefect De Tournon distinguished between high production areas and average production areas [25]. In the former, particularly in the Tivoli arrondissement, the average yield of a plant was as much as 6 to 10 deciliters per year, and the cultivation of olive trees assumed the character of specialized olive grove in those rare cases of a density of 150 plants or more per hectare. Other patterns were to be found in terraced areas, with trees growing within 5 feet from each other (in the municipalities of Velletri, in the vineyards of the municipalities called ‘the Castelli’ south-east of Rome). Irregular patterns, termed ‘scattered’, are mentioned as well.

De Tournon reports that, in 1813, in Lazio alone, olive farming covered some 27,000 hectares, producing three million liters of oil. To the north of Rome, the Sabina, ‘open only to the winds of the South’, boasted model productions, thanks to the trials carried out by an enlightened group of landowners: in Tarano (Marquis Potenziani), Castel Nuovo di Farfa (Marquis Simonetti), Piediluco (Marquis Pianciani), and Monteleone (Baron Gambari) [26].

The Papal States wavered between hankering after the free market following the drive for modernization promoted by the European Nation States and protectionism fundamentally aimed at ensuring distribution and trade on major urban markets of basic necessities: wheat, oil and meat. These food items were marked with the term ‘grascia’ (from Latin *crassia*, fats). In the case of Rome, a city with no countryside due to land organization still based on large unproductive estates, the fundamental issue was catering for the needs of a population of about 200,000 inhabitants with goods coming at great expense even from distant countries by mainland and sea. Alongside the rules on the preservation of the slopes with reforestation measures, from the mid-eighteenth century onwards, the Papal State encouraged the planting of olives for productive purposes, setting up the incentive of 1 Paolo (the tenth part of the Papal Scudo) per tree, equal to the daily wage of a farm-worker [27].

Whilst, at the turn of the century, domestic demand was very far from being met, in the mid-1850s in the traditional areas of production—the Frosinone region, the Tiber basin, Umbria and *Tuscia*, but also in the papal *Marca*—there were over 95,000 hectares planted with olives and 1500 hectares with vines and olive trees: a sizeable production meeting 87% of domestic requirements [28].

In the Papal Provinces of Marche and Umbria, a particular form of contract, sharecropping, began to take hold, resulting in mosaic landscape patterns due to a more or less intensive polyculture with wood crops on flat lands and slopes, often alternating with woods and pastures, which tended to shrink, and small tenures of size on average less than ten hectares.

In the Kingdom of Naples, the sale of State property from 1806 onwards gave origin to the division of agricultural land and the transfer of ownership. Oil production resumed with two kinds of arrangements, the so-called *contratti di livello* and the *enfiteusi* (leases) [29], and there was general improvement of country life conditions.

The second phase—*raising the altitude of groves and supporting the mountain economy*—took off a few years after the Unification of Italy (1861). In this period, landscape transformations were characterized by drastic reduction of the forests, even at the expense of the integrity of the soil and slope stability, and by increased tree crops which, in the South and in the *Agro Romano*, integrated the field system and the transhumance of sheep flocks [30].

The more favorable climatic conditions fostered a process of ‘taming’ of the mountain, in which the traditional economy of the forests and sheep-rearing were integrated with the cultivation of land leased according to ‘rights of commons’ consisting of collective rights, such as hunting, grazing, planting, rooted in practice only by the members of a particular community. This process underwent a substantial acceleration with the Forest Law of 20 June 1877, which allowed the cutting of wooded

areas to the upper limit of the chestnut trees—an altitude of 1200 m, 1000 on the Adriatic side and 1300 to 1400 m in the inland areas—and substitution with fruit-bearing trees.

The olive tree, grown in mixed form, spread up to an altitude of 800 m in the valley areas between mountains exposed to the East and sheltered from the winds, especially on the Majella and Gran Sasso mountains (Abruzzo). Superficial and expanded roots (60–100 cm depth) are adapted to stony ground and hold the soil on the slopes, while the natural robustness of the trees allows them to resist in temperatures of  $-5\text{ }^{\circ}\text{C}$ ; finally, the dry climate protects the fruits from the many parasites.

In the South (mainly the areas which used to belong to the Kingdom of Naples), between 1860 and 1929, the basic stability of areas of arable land with or without trees and permanent pasture and meadow was matched by a considerable increase in areas with trees and specialized crops (from 276 to 1609 thousand hectares) and the halving of the areas with woodland and chestnuts (from 2094 to 1277 thousand hectares) (Figure 4).



**Figure 4.** Residual polycultures on the Sibari plain (Calabria. Credits: Ottavia Aristone).

The gradual transformation of arable land into olive groves changed conditions throughout central Italy, providing an important contribution to income from agricultural work, and shaped new landscapes between the woods and villages, thus setting off a process of differentiation in the Apennine areas.

However, in Abruzzo, the production of olive oil, which represented 6.4% of the national total ten years from the Unification of Italy, underwent a continual reduction until the end of the 1930s (4.9%), regaining momentum in the post-War period (at the end of the 1950s it was almost 6%). Nevertheless, the areas devoted to olive growing almost tripled from 1870 to 1951 (from 68 to about 200 thousand hectares), still prevailing as polycultures over specialized crops in a ratio of 20 to 1 [31].

### 3.2. Geographies, Economies and Consolidated Landscapes

Until the 1960s, olive trees were considered natural tree species not needing specific treatments (fertilization and pruning), in the absence of which profitability was very low. After the destruction caused by the frost of 1956, there was widespread replanting (specialized) and new agricultural contracts supported by government grants (Law 839 of 26 July 1956, refinanced several times) to the peasants-farmers aimed at covering the costs of replanting, treatment and pruning.

The law also financed specialization courses in olive growing and olive oil extraction and provided funds for district agriculture authorities and observatory stations of plant diseases and insect pests devoted to technical assistance to farmers. This was in accordance with customary regional and local practice: in fact, since the Unification, a major effort was made in order to diffuse economic practices and techniques in specific schools of agriculture or delivered by municipal ‘peripatetic chairs’ that changed location every few years.

Both Lazio and Abruzzo, albeit with very diverse territorial and historical situations, have accumulated precious experience in cultivation and oil production (Table 1).

**Table 1.** The olive oil economy in figures (National Institute of Statistics, Census of Agriculture 2010, compared to 2000).

Main Features	Lazio	Abruzzo
Hectare (HA) of olive groves average	67,438 (−9.8%) 1 HA	42,773 (+6.9%) <2 HA
Percentage of utilized agricultural areas (UAA)	11%	9.77%
Firms	67,996 (−39.5%)	54,273 (−3.4%)
Presses	389	465
National share (agricultural areas)	7.65%	3.85%
Annual production (2007–2008)	22,668 tons	15,872 tons
National share (annual production)	3.95%	2.76%
Protected designation of origin brand (PDO)	Canino Sabina Tuscia Colline Pontine	Aprutino-Pescarese Colline Teatine Pretuziano Colline Teramane

The last few years have been particularly difficult everywhere in the Italian Peninsula, following a fall in production and problems with pests and diseases, as well as the restructuring processes of the production base that sacrificed the smallest firms, which did not join associations. In fact, in 2010, the olive sector numbered 902,075 firms, a decrease of 19% compared to 2000, and registered 1,123,330 hectares of utilized agricultural area (UAA), a rise of 5.3% [32,33].

Due to the rationale of the agricultural sector, these economies take on locally diverse characters. Still, whatever the home place, contemporary lifestyles are shaped by urban needs, often involving daily commuting between the work-place and urban facilities. Production in Lazio satisfies the demand of the extensive market of the Capital, whilst that of Abruzzo serves a less populous area within a more widespread distribution of cultivation.

In Lazio, with a national share of 4%, olive cultivation is a widespread traditional activity: according to the Census of 2010, there were 67,996 firms involved (70% of the total), over an area of 67,438 hectares.

Since 2000, the regional olive sector has seen a progressive reduction in the number of firms devoted to producing table olives and olive oil and a concomitant, albeit more modest, reduction of cultivated areas. The two trends have resulted in a moderate increase in average farm size, which stands at one hectare.

Olive production in specialized facilities is conducted by 32,859 firms with an acreage of 35,463 hectares, corresponding roughly to one-half of all olive producers (48.3%) and holding 52.6% of the regional olive growing area.

One-quarter of the estimated production of olive oil is being marketed without intermediaries and in traditional ways: proximity to the olive press or personal acquaintance with the manufacturer. In both cases, product certification is not requested by consumers, who base their choice on direct experience of the production site and on product reliability.

Small-scale production for own consumption is frequent, but hard to quantify. Associating for marketing (5.9% of the estimated production of olive oil, 3.2% of growers) is rare compared to wine,



cereals, fruit and vegetables and dairy products, revealing resistance to novelty that can only further affect a sector already in difficulty.

Abruzzo is the fifth region in Italy for production, with a national share of 2.8%, although in recent years this has declined by about 35%. Weather conditions and in particular persistent droughts have greatly impacted on fruiting, causing wilting of drupes where no additional emergency irrigation was provided.

Nevertheless, Abruzzo boasts an important olive growing tradition distributed evenly over much of the region, with over 54,273 firms, of which only one-quarter display specialty crops—and an area of 39,873 hectares with more than 9 million and about 40 varieties of trees, for the most part organically grown.

Marketing is primarily through direct sale by the producer or processor/press owner. From data processed by INEA, 18% of total production is for own consumption; of the remainder, 58% is sold by the processor/press owner, 27% through direct sales by the company, 10% through the commercial network, whilst 3% is for catering firms and 2% goes to the food industry [34].

In Abruzzo, olive cultivation is widely and comprehensively distributed throughout and, along with viticulture, stands for the category ‘permanent crops’. The coastal hills (above sea level to 200 m) are characterized by a better overall terrain, often irrigated and irrigable, by mostly specialized plots bearing not very old plants, yet with productivity greatly affected by weather conditions and the presence of the olive fruit fly.

The internal hilly area (between 200 and 350 m above sea level) is where most olive orchards are to be found. Olive cultivation here is closely linked to the landscape, culture and traditions; in these areas, there are medium to small family farms, but also numerous orchards of greater size. Olive trees on average are older than 50 years and there are numerous examples of ancient, centuries-old olive groves where high qualitative and quantitative levels are reached. Olive groves in the hilly foothill areas and inland areas (between 350 and 700 m above sea-level) are less important, although there are age-old plants and olive groves of considerable extension. There is good potential here: the oil produced is of good quality and trees show good resistance to pest attacks.

A number of Protected Designation of Origin Production areas (PDO areas) include or are close to the cities: this proximity between rural and peri-urban gives rise to landscape mosaics characterized by high fragmentation in land use, including arable land evoking the old practice of mixed cultivations. At the same time, as previously argued, these areas are rooted in a crop tradition dating back to Benedictine settlements and somehow reshaped according to the post-War ‘territorialization phase’—*replanting and specialization*—which set off all over the Peninsula a process of replacement of polycultures with specialized ones (Table 2, Figure 5).

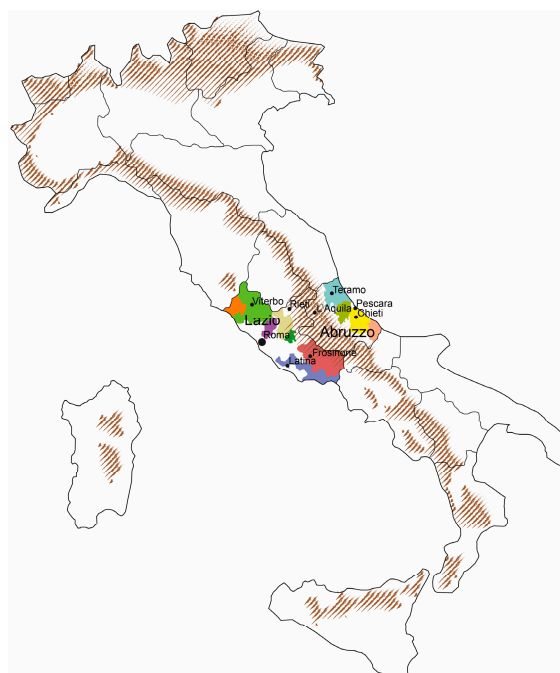
Such connection between olive cultivation, hilly landscape and oil is at a turning point whose evolution is difficult to interpret. It concerns both the production sector in the strict sense—economies and income—and the chance to keep reading the forms of landscape devoted to olive farming according to the established syntax of rural areas.

Interviews with professionals, experts and farmers, urged to provide insights into production, processing and marketing of olive oil on the domestic and international markets, provided further considerations over strengths and weaknesses of the sector with a major focus to place-specific development paths, that is ‘territoriality’.

Besides sector-specific barriers to market, olive production areas are confronted with the need of more sustainable and resilient scenarios. The olive oil sector displays several strengths, such as strong territorial characterization; fairly good specialization and steady-state quality levels; willingness to invest on quality; proximity to urban market; inherent resilience of olive groves despite the labor crisis; excellent product personality; availability of first class olive pressing plants in the vicinity; consortiums’ proactivity in the marketplace; and, in the case of PDO Sabina, some success of standardized packaging in order to bestow identity to the brand.

**Table 2.** Protected Designations of Origin Production areas in Lazio and Abruzzo.

Lazio	Abruzzo
<p>Lazio encompasses four recognized Protected Designation of Origin Brands (Extra virgin olive oil <i>Canino</i>, Extra virgin olive oil <i>Colline Pontine</i>, Extra virgin olive oil <i>Sabina</i>, Extra virgin olive oil <i>Tuscia</i>) and two more under certification (Extra virgin olive oil <i>Terre Tiburtine</i> and the <i>Gaeta Olive</i>), which take up large areas corresponding to traditional olive farming.</p> <p>Nevertheless, the 2010 Census only found 1365 firms producing characteristic olives subject to norms (accounting for 2% of the firms engaged in olive growing). Organic olive growing, while covering 8% of the national agricultural area devoted to it, is performed by only 2.3% of regional olive farms, denoting low propensity for the adoption of the organic approach.</p> <p>The PDO <i>Sabina</i> brings together 46 municipalities of the Province of Rome and Rieti, among which a small portion of the Capital itself. It has accentuated its supply chain characterization, at times with association connotations. The total volume of the product amounts to about 9000 tons. The proximity of Rome obviously makes the Capital the first user, but the Sabine oil is also marketed in northern Italy and abroad.</p> <p>Still, production for a kind of ‘expanded own consumption’, with very low incomes, accounts for 2500 tons of product.</p> <p>As for ‘cultural landscapes’, the whole area encompasses the National Monument ‘Gorges of the Farfa River’ (about 600 hectares, which belonged to the Benedictine Abbey of Farfa). The steep slopes of the valley are still dotted with specimens of centuries-old trees standing on small terraces supported by semicircular containing walls, the so-called ‘lunette’.</p>	<p>Abruzzo numbers about 9 million olive trees with more than 40 varieties grown. Some of them are, in quality and quantity, the basis of the approximately 14,000 tons of oil produced every year: 90% extra virgin olive oil, mostly organically grown. Three areas have been awarded the Protected Designation of Origin Brand that enhances the cultivar-territory binomial.</p> <p>The PDO <i>Aprutino-Pescarese</i> was the first to be recognized in 1996. This oil comes from the Vestino and Casauria foothills and hills, embracing 34 municipalities located between the mountain ranges of the Gran Sasso and Majella which provide a barrier to severe freezes, while the Adriatic Sea softens the climate.</p> <p>The PDO <i>Colline Teatine</i>, divided into three sub-zones, was recognized in 1997. It regards most of the province all along the coast and inland. The cultivar <i>Gentile di Chieti</i> is the prevalent variety (50%) along with the <i>Leccino</i> (40%); other varieties such as <i>Cucco</i>, <i>Nebbio</i> and <i>Intosso</i> make up the remaining 10%. It has an additional geographical denomination officially recognized: the Frentano and Vasto areas.</p> <p>The PDO <i>Pretuziana</i>, recognized in 2003, is native to the area between the sea and the hills of the province of Teramo. The oils that are part of this denomination must consist of at least 75% of <i>Leccino</i>, <i>Frantoio</i> and <i>Dritta</i>, while the remaining 25% is of other lesser local cultivars such <i>Carboncella</i>, <i>Tortiglione</i> and <i>Castiglione</i>.</p> <p>Long-standing practice in olive farming is testified by preservation of a huge 1700 years old olive tree recently detected in the orchard of the Abbey of San Giovanni in Venere (Fossacesia) in the Province of Chieti.</p>

**Figure 5.** Protected Designation of Origin oil production areas (Credits: Romina D’Ascanio).

Among the weaknesses, on the backdrop of seasonal fluctuations in product quality and yields emphasized by climate change, inherent criticalities are small-size farming; ageing and poor generational change; inadequate overall awareness of the product compared with other production areas in Italy; strong competition from imitation products; drop in the price of olive oil in the market place with speculative behaviors of brokers and traders delivering last stocks below market price; a general trend to standardize the manufacturing process at the expense of strong territorial characterization. Most often, skilled labor in harvesting and pruning is lacking or is very expensive, and the trees undergo severe deterioration (Table 3).

The need to stabilize olive oil production by limiting its fluctuations requires rationalizing or expanding specialty crops in the medium hill strips (300–500 m), or otherwise searching for new locations: such is the case of the Roveto valley along the Liri River (Abruzzo), where over the last six years 5000 olive trees have been replacing the forest along the lower hillsides.

**Table 3.** Strengths and weaknesses in the PDOs in Lazio and Abruzzo (data processed by the Authors from the interviews).

<b>Production Processing and Marketing</b>
<b>Strengths</b>
<ul style="list-style-type: none"> <li>• Suitability of the areas devoted to olive cultivation;</li> <li>• High ratio of extra virgin olive oil of the total amount;</li> <li>• Increase in the average quantity of olives processed in presses;</li> <li>• High variety of olive cultivars and differentiation in processing (Organic);</li> <li>• Widespread diffusion of presses, notably in the ‘Cantine sociali’ (Community wine Cellars) (Abruzzo);</li> <li>• Proximity to Rome, the largest catchment area for olive oil market (Lazio);</li> <li>• PDO and Organic foreign market: North America (Canada, USA) and Northern Europe (Abruzzo);</li> <li>• Research and Innovation Centre for olive growing and the olive oil industry (Abruzzo).</li> </ul>
<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>• Strong fluctuations of annual yields in terms of quantity and quality;</li> <li>• Land fragmentation and self-consumption;</li> <li>• Low use of information and communication innovative techniques;</li> <li>• Ageing of business leaders and difficulty in generational change;</li> <li>• Unwillingness to cooperate in associated farming groups;</li> <li>• High production costs compared to the selling price and difficulty to compete with non-certified firms;</li> <li>• Absence of sub-contracting;</li> <li>• Lack of skilled labor or costly skilled labor;</li> <li>• Persistence of traditional olive groves, consisting of unbalanced old plants badly adapted to mechanization;</li> <li>• Poor engagement of local institutions;</li> <li>• Contraction in the national quality market;</li> <li>• Gaps in the EU legislation including olive oil among ‘fats’;</li> <li>• Inadequacy of the processing: underperforming presses and warehouses for the storage of olives and olive oil;</li> <li>• Difficulty to raise supply critical mass for new markets (either traditional selling or internet trade);</li> <li>• Logistic and financial difficulties to comply with current legislation.</li> </ul>

New opportunities derive from emerging domestic and foreign markets, even due to an increase in extra virgin olive oil consumption following healthy nutrition models and guidelines (Mediterranean diet).

As for threats, both the Common Agriculture Policy and the reduction of duties for products from southern Mediterranean countries expose olive oil to unfair competition, even more so with the aftermath of the 2008 crisis. The abandonment of the plants in the inner areas results in irreversible deterioration of the environment and rural landscape. Such phenomena increase the divide between subsistence agriculture in so-called ‘bone land’, that is interior areas and rugged territories historically affected by water scarcity, and the well-irrigated and productive zones of the ‘pulp land’ [35].

The olive oil sector does not require a clear separation between the different stages of the supply chain. It is therefore not necessary to distinguish between primary processing—activities linked to the presses—and the second stage—bottling and marketing. While many medium-sized and small companies are vertically integrated, large companies have specialized industrial enterprises in the true

sense of the word: they buy oil, possibly blend and bottle it, usually far from the places of production, and then market it.

The stages may be very varied and depend on the company size, people involved and market dynamics. Most customers buy direct from the producers, whilst access to new technologies enables consortia to reach far away markets worldwide. In both cases, networking plays an important role. However, direct purchase is tending to shrink, and online purchasing concerns just a niche market. Conversely, the big industries needing critical mass and a more standardized product in terms of quality, organize their production according to the organoleptic characteristics of the oil rather than to its origin. Such unfair competition relying on lower costs and easier access to urban markets through large retailers, marginalizes, by so doing, the share of daily use of this quality product.

All considered, contemporary olive economies and landscapes are increasingly differentiating from the traditional ones: olive growing modelled the territories where it was introduced, updated modes and cultivation techniques, and set off the process of modernization of the whole chain: producing, processing and marketing [36]. Still, for the olives here, as elsewhere for grape growing, small ownerships, often neighboring specialized farming, find it hard to associate due to deep-rooted mindsets (Figures 6 and 7). Yet, we do not know how they will evolve, nor for how long [37].

In the case of PDO production area *Aprutino-Pescarese*, the leading agricultural cooperative established in 1966 consists of about 11,000 members, with an oil production of almost one-fifth of the regional total. It guarantees the quality of the processed product and marketing in foreign markets for a share of 70% of the regional total.

As for PDO production area *Sabina*, the past programming period 2007–2013 has witnessed the establishment of the Leader + Community initiative Program ‘GAL Sabina’, intended to increase quality and profitability as well, facing highly fragmented ownership, general ageing and a certain amateurism in cultivation practices. Conversely, the huge catchment area of Rome would allow for a short food supply chain market strategy [38,39]. Current Rural Development Plan (RDP) 2014–2020 contemplates public commitment to supporting multifunctional production and market-oriented strategies while promoting sustainable rural development processes by providing basic services such as certification, presses, transparency in international trade, etc.

The purchase and ‘reparcelling’ of small ownership is a key element in order to improve competitiveness both in terms of cost containment and of easier access to distribution channels usually requiring a minimum level of production; for such purpose, the analyses conducted indicate that regional policies could facilitate and increase corporate restructuring [40].



**Figure 6.** Mosaic of olive tree plots (Abruzzo. Credits: Bruno Imbastaro).



**Figure 7.** Specialty crops (Casalincontrada, Abruzzo. Credits: Ottavia Aristone).

### 3.3. Ongoing Processes and Possible Scenarios

As previously discussed, most enduring landscape features in central Italy are associated to olive growing in specialty crops or intertwined with other crops. Still, the data set at the national level shows how both patterns have changed over half a century (Table 4).

**Table 4.** Crop olive specialized and mixed cultivation (National Institute of Statistics, Census of Agriculture 2010, compared to 1960).

Landscape Patterns	1960	2010	var.
Specialty crops	909.50	1.01100	11%
Promiscuous cultivations (herbaceous and permanent crops)	1.38770	112.33	−92%
Thousands hectares	<b>2.29720</b>	<b>1.12333</b>	

Overall, the cultivations decreased by half, mainly at the expense of promiscuous crops that account for less than 1/10 of the surfaces occupied in 1960. Currently, 90% of the total olive growing land use is attributable to specialty crops.

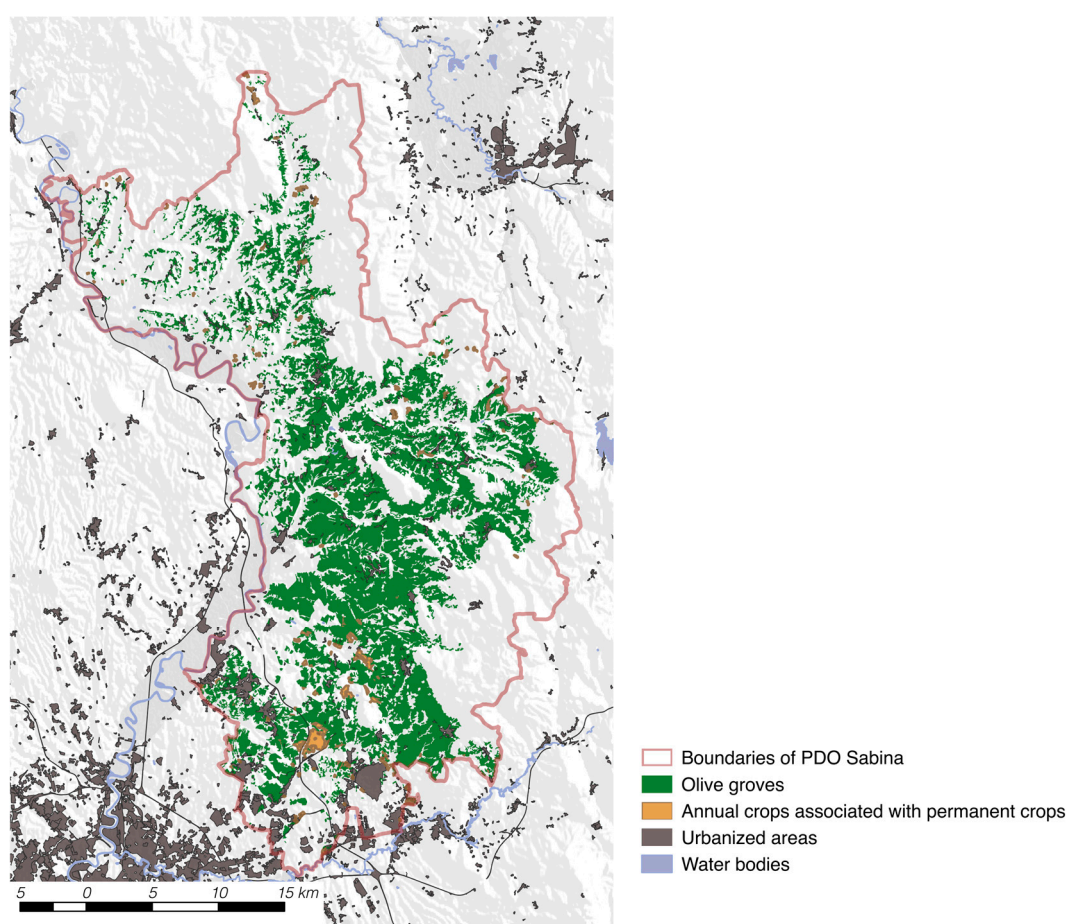
Surveys conducted nationwide on 2010 Census data account for strong correlation between olive growing and steep land areas. No less than 61% of olive crops are still located in hilly areas, 11% in the mountains and 28% in lowlands (Census of Agriculture 2010). High fragmentation is a main feature: farms under the threshold of 5 hectares account for 80% of the total amount. The majority of these micro-enterprises are, in fact, the result of extreme hereditary divisions, or of subdivisions of agricultural plots for new land uses, notably in the urban fringe, that can be either more or less cultivated or abandoned, due to the inability or unwillingness to continue their maintenance [41].

Thematic mapping can only detect ‘olive groves’, that is “are as planted with olive trees, including mixed occurrence of olive trees and vines on the same parcel”, as a single land cover category corresponding to extremely varied landscape patterns within the comprehensive land use class ‘permanent crops’. Due to geomorphology, pedology, slope orientation, and the ‘human factor’, no generalization is possible: between a central Italian olive tree and a southern Italian one, there is often the same difference as that between a dwarf and a giant. The olive tree landscapes themselves follow different ‘paces’, according to the cultivars and planting layouts. In the nineteenth century, specialty crops bore some 150–200 samples per hectare. Current arrangements enable olive-growers to accommodate up to 400–460 plants per hectare, creating entirely new landscapes [42]. Planting distance

on average fluctuates, in the vase-shaped trees—the form adopted in most cases—from 7 to 12 m, to avoid the canopies touching once they reach their maximum development: excessive density may irreparably affect the outcome. Finally, a major distinction is to be drawn between so-called square designs, in which the trees are equally spaced within and between rows, and the equilateral triangle system, where trees are planted at the vertices of equilateral triangles.

Conversely, in hilly inland areas, landscape characters associated to olive economy owe a lot to the millenarian persistence of traditional orchards combined with grassland: from the standpoint of rural economies, the small size of properties still allows for a recurrent pattern displaying olive trees in rows variably arranged.

In this respect, the PDO Sabina production area falls within the borders of the Roman ‘Sabina Regio’, northeast of Rome, touched by the Tiber River and its tributary Aniene River. As shown in Figure 8, specialty crops, mostly located in hilly areas, are less frequent at higher altitudes, in the river plain and along minor tributaries.



**Figure 8.** PDO Sabina, Lazio. Within the boundaries of the PDO Sabina (110,782.34 hectares), ‘olive groves’ alone total 32,829.17 hectares, while ‘annual crops associated with permanent crops’ total 902.44 hectares. Data processed by the Authors from the Charter of Land Use of the Lazio Region (2010). Corine Land Cover Nomenclature 4th and 5th level, scale 1:25,000.

The area encompasses large estates which used to belong to the Benedictine Abbey of Farfa.

Here, small size parcels which may accommodate even residual or newly planted groves (within the category ‘Heterogeneous agricultural areas’, notably ‘Annual crops associated with permanent crops’) remind of sharecropping systems (Figure 9). Still, due to the size and features of these plots, such a phenomenon is underestimated by thematic mapping.

All these arrangements are more or less dependent on/resilient to the needs from the urban areas requiring the ‘countryside’ for consumption both in terms of products and of leisure time, among a broad range of green spaces and other environmental features. Altogether, the signs of this epochal transformation were already apparent to Henri Desplanques who, in the 1970s, wondered “whether agriculture is actually endangered, and if horticulture and certain forms of leisure agriculture will remain. Rome counts less and less on the *Agro Romano* and on Lazio, which has a population of less than 10% active in the sector, to obtain foodstuffs” (pp. 751–752).

As a matter of fact, from WWII onwards, a major change in the shares of labor employed—in 1950, no less than 42% of the active Italian population was employed in agriculture, whilst in 2010 only 3.8%—has significantly impacted on lifestyles and settlement structures at the expense of agricultural land [43]. At present, according to the dictates of productivity fueled by high returns from intensive farming, new ‘operational landscapes’ are at work: they display all the characteristics of industrial exploitations, all the more so because the building industry has long been affected by the crisis.



**Figure 9.** Layout of olive trees on small plots (Sabina, Lazio. Credits: Anna Laura Palazzo).

As a matter of fact, productivity imperatives compel the adoption of new cultivation techniques, and the olive tree is intensively cultivated within the limits of its range of possibilities, even and especially in lowland areas (*espalier*). Nowadays, much of the mass market is controlled by foreign companies (especially Spanish), which have relieved important Italian quality brand names but are marketing alien productions. To fight foreign competition, large farms all over the country, even in areas of manufacturing excellence, are preparing new intensive approaches according to the model designed and developed by the *Nurseries Agromillora Catalan* in partnership with the *Institut de recerca y tecnologia agroalimentaries* of Catalonia.

Such systems contemplate the replacement of local cultivars with others deemed more suitable, with larger fruit and better yields (90–100 quintals per hectare of olives per year), and the use of the *espalier* system which allows an increased tree density (from 400 trees of the traditional specialized plot to about 1500–2000 trees per hectare) (Figure 10).

To promote mechanized plot management (pruning, treatments and harvest) and significantly reduce the cost of harvesting, the new plots are located on gentle slopes or preferably flat ground, where irrigation is also easier (Figure 11).

From an agronomic point of view, there are certain limitations, such as poor durability of the tree which, to maintain productivity, must be replaced every 15–20 years, with a phase of minimum development of 3–4 years with increasing yields. This new practice, although still marginal, indicates some probable developments.

In relation to production, we find a growing separation between the oil's characteristics and its area of origin, and a further reduction of certified products reserved for niche markets. However, as regards to the renewed ability to create landscapes, we are contributing to a massive relocation of crops from the hillsides to flat ground, while small groves (some no longer producing, having been abandoned) and 'rural gardens' will have the task of protecting the environment, as well as holding the soils of the hilly slopes and foothills.



**Figure 10.** Superintensive espalier planting (Scarlino, Toscana. Credits: Ottavia Aristone).



**Figure 11.** Superintensive espalier planting (Scarlino, Toscana. Credits: Ottavia Aristone).

All these phenomena bear witness to the lack of effective actions to oppose any rationale based on profit, and to few territorial policies able to preserve the environmental, cultural and economic development of the rural space. In fact, the destiny of urban areas depends upon effective and resilient agri-forestry strategies and health and food security policies; thus, oil economies and olive landscape,



as main components of such ever broader ‘urban domain’, should be at the core of any planning instruments and policies.

#### 4. Discussion

Persistence of historic landscapes has become, for some time now, a major issue in the Mediterranean world. Despite being a major part of this narrative, olive growing, its diffusion and landscape features—diverse but united by the firm countenance of the majestic tree—are entering a new phase, notably in the regions of central Italy. Besides present-day hazards of climate change and vagaries of markets, a major problem lies in the divide between intensive full-scale industrialization and enduring ‘cultivation patches’: a divide entailing unavoidable trade-offs among identity and profitability.

Under a territorial perspective, possible sustainable scenarios are related to the following aspects: (a) awareness raising of the Mediterranean oil tradition’s cultural roots; (b) protecting the manifold landscape features in which olive groves are available nationwide.

(a) After the important acknowledgment of the Mediterranean diet by UNESCO, the long-standing tradition of olive oil, opposed to that of butter typical to Northern Europe, is expected to increase awareness about links between healthy eating habits and a wide variety of cultivars of high environmental and cultural value. In this regard, it is worth noting that the two typical Mediterranean productions, wine and oil, over the past decades have not been subjected to marketing and territorial quality promotion in the same way. Wine has emerged from the ghetto of the taverns, not only in the production areas of excellence, and has established itself as a visible, even overexposed and worldly product. By virtue of the nature of wine, production areas have emerged as places for new social gatherings and a ‘business card’ of the wine-making firms. The wine ‘cantina’ has become at once a wine bar, restaurant, resort, museum, place for artistic events and landmark for new forms of extensive fruition of rural areas. So much so that the transformation of the existing structures, adapted to the new needs of representation as well as production, has made use of high-level concept design according to the phenomenon, now widespread, of ‘designer wineries’. Conversely, factors such as the hidden and daily use of oil, its modest nature as an ingredient, lack of support from the institutions at the promotion stage, along with persisting regulations labelling olive oil among ‘fats’ and controversial traceability rules for the product have not favored an equal success in the market.

(b) Whereas awareness raising needs to be addressed by general policies at every level, the material preservation of olive landscapes, often within the range of major cities, requires place-based policy settings. In Lazio, the most valuable areas are the backdrop to urban sprawl (first and second homes), providing relaxing setting within easy reach from the Capital. In the Adriatic Abruzzo, with regard to more balanced conditions of polycentric settlements, the urban, suburban and rural coexist without any major distortions, substantially contributing, however, to altering the features of the old opposition between town and countryside.

Over the last two decades, the attraction of conurbations and coastal areas has gradually weakened. Still, urban footprints keep expanding, incorporating low-density development, from rows of single-family homes with gardens to large commercial and manufacturing concentrations next to important highway junctions. The phenomenon, quantitatively documented, bears place-specific characters [44]. Whether these trends are socially and economically sustainable is debatable: it is sufficient to think of soil consumption, notably in the Metropolitan area of Rome, which alone touches 71,000 hectares, increasing by 500 hectares between 2012 and 2015 at the expense of agricultural areas [45].

Indeed, in intensive farming areas, traditional rural landscape is disappearing, or its features are undergoing a simplification. Next to the main cities, the sprawl urged by the first and second homes market jeopardizes less profitable farming activities and causes further cadastral subdivisions. Still, these behaviors of ‘Sunday farmers’ are not to be deprecated in all cases: in fact, maintenance or planting of olive trees in small plots and rural gardens plays an important role against landslides.

Whatever the case, peri-urban areas display “a multi-functional environment, often characterized by essential service functions; a dynamic environment, characterized by adaptation and conversion between uses; low-density economic activity including retail, industry, distribution and warehousing; an untidy landscape, potentially rich in wildlife” [46] (pp. 8–9).

At this stage, the core problem is to bridge the privileges of the urban condition—the sharing of social and civic value—with the benefits of the countryside—a better living environment and a healthier lifestyle [47,48].

To fully seize the ongoing processes and inherent opportunities for innovation, according to EU and OSCE guidelines, spatial policies should support this paradigm shift through programs aimed at preventing abandonment and hydrogeological risks, preserving the environmental, cultural and economic development of rural areas, investigating more thoroughly the rationale behind new lifestyles—not only in terms of agricultural production, but also of the use of rural services and spaces for living, especially in areas under higher human pressure [49,50].

Finally, we should unambiguously address a notion of landscape that has also become central in public opinion, after centuries of use of this concept by the elite in the limiting key of representation and appreciation of nature—more so ‘man-made nature’ [51].

The derivation of ‘Landscape’ from ‘Land’ (‘a piece of land’), according to a recent definition provided by the European Landscape Convention (2000)—“Landscape means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors”—allows for ‘everyday landscapes’, where the inhabitants may lay the foundations of economic and sustainable behaviors towards the values inherited from these landscapes [52].

This notion of ‘landscape’, inclusive and transversal as it is, embodies both an idea of everchanging patterns: either movement in urban facts or vitality in nature's reproductive cycles.

The core of the matter, and the challenge of its own transcription in terms of proactive policies, lies ultimately in the consideration, to quote Jean-Marc Besse [53], that landscape keeps playing a mediating role between man and nature: so that the latter continues to exist as a ‘world’ for human beings.

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