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ITALIAN TERRACED VINEYARDS: A GEOGRAPHICAL OVERVIEW

Viñedos italianos en terrazas: una mirada geográfica

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ABSTRACT: Viticulture, together with olive cultivation, represents the main productive use of Italian terracing. By means of photo-cartographic analyses, this article reconstructs a localized and size-related picture of the country's principal terraced viticulture systems. It analyses their historical processes from the beginning and the correlated causes of abandonment which have affected them, with significant consequences for the hydro-geological assets of the slopes concerned. Finally, it highlights the limits and necessities of the political-territorial actions developed around these realities.

KEY WORDS: Terraced land; viticulture; land abandonment.

RESUMEN: La viticultura, junto con la oleicultura, representa el principal uso productivo de las terrazas de cultivo en Italia. Mediante análisis fotocartográficos, este artículo reconstruye el tamaño y la localización de los principales sistemas de viticultura en terrazas del País. Se analizan sus procesos "genéticos" y las causas de abandono que los han afectado, con consecuencias significativas sobre el régimen hidrogeológico de las laderas en cuestión. Posteriormente, el artículo presenta los límites y las necesidades de las acciones político-territoriales desarrolladas en torno a estas realidades.

PALABRAS CLAVE: Terrazas agrícolas; viticultura; abandono del campo.

1. Introduction

Research on Italian agricultural terraces was born from the academic studies conducted in the Eighties by Remo Terranova (1984; 1989) focused on the eastern Ligurian coastal hill slopes. From that point research on terracing in Italy took its first steps, subsequently experiencing a phase of renewed interest and significant growth over the last two decades. In these years, at a national level, many coordinated research programs have led to important outcomes (Trischitta, 2005; Scaramellini & Trischitta, 2006; Scaramellini & Varotto, 2008; SLM, 2010); nevertheless, we are still very far from having – in a relatively exhaustive form – an effective analysis of the phenomenon, which at the height of its apogee probably extended over a total surface of between 200,000 and 300,000 hectares (Bonardi & Varotto, 2016: 49; Varotto *et al.*, 2019b). Yet, despite their role in characterizing the Italian landscape, wine-growing terraces have been studied in only a small number of research studies, geographically limited to a few local contexts, among which should certainly be mentioned the Valtellina (province of Sondrio, Lombardy) (Scaramellini, 2014; Lorusso, 2014) and the Cinque Terre (Terranova *et al.*, 2006).

Apart from what is presented in Bonardi (2014a), Bonardi & Varotto (2016), Bonardi (2019) – the latter concerning the areas of greatest appearance of the phenomenon on a European scale – our knowledge is not only limited historically but also as regards terracing's typological aspects, extent, and current state. The absence of the minimum of basic information – such as the location or the actual size – on many of the terraced systems that existed or still exist makes drawing a general – albeit synthetic – picture of the phenomenon on a national scale rather complicated.

On the other hand, these difficulties also clearly emerge in other European countries: some partial exceptions can be found for Germany (Petit *et al.*, 2012), especially as regards the historical and constructive aspects, for France (Blanc, 2019) and for Slovenia, exhaustively studied by Ažman Momirski (2008; 2009; 2019). More numerous in the international field are those studies on single areas of significant economic importance, for example those on the Alto Douro vineyards (Bianchi de Aguiar, 2010), on the Banyuls region (Constans, 2010), on Wachau (Kieninger *et al.*, 2016), and on the Canaries (Pastor & Contreras Villaseñor, 2013).

However, in all these cases the size of the terracing is not comparable to Italian terracing. Although there is currently no effective quantification of the phenomenon, it is correct to assume that at a territorial level Italy boasts the largest extent of wine-growing terraced surfaces in Europe and, consequently, in the world. This work must therefore be considered as a first attempt to systematize pre-existing knowledge into a unitary framework, while at the same time expanding such knowledge through specific researches aimed at clarifying the current density and distribution of Italian wine-growing terracing, the trends that invest it, the critical issues and its potentials. These trends are linked to the phenomenon of abandonment which pervaded European mountain cultivation in the twentieth century, above all during the Second World War. The decline of agriculture in the mountains has had important consequences at an environmental level (García-Ruiz & Lana-Renault, 2011; Varotto *et al.*, 2019a) and, in particular, on hydro-geological assets (Moreno-de-las-Heras *et al.*, 2019) and the intensity of erosion processes (Arnáez *et al.*, 2015). Such problems are accentuated and have specific outcomes in the semi-arid environment of the Mediterranean mountains (García-Ruiz & Lana-Renault, 2011), among which, in Italy, the technique of terracing applied to viticulture is widespread. Different and sometimes opposing approaches have emerged as possible answers to these problems, but covering the wider field of European mountains rather than the specific field of terraced slopes (Lasanta *et al.*, 2015; MacDonald *et al.*, 2000). These problems appear to be accentuated in the current context of climatic change, above all in conjunction with events of intense precipitation (Brandolini *et al.*, 2018a), which can also affect important contexts of cultural heritage (Agnoletti *et al.*, 2019; Boccia *et al.*, 2020). These problems are combined with those of an economic nature, above all linked to the tourist potential of the terraced landscapes (Terkenli *et al.*, 2019), and also in some respects linked to situations of hydro-geological risk, and of an ecological and landscape type (Agnoletti, 2007).

The sum of such problems and the recognised multifunctionality of the terraced landscapes (Lasanta *et al.*, 2011; Fusco Girard *et al.*, 2019; Romero-Díaz *et al.*, 2019) justify the necessity for an analysis of Italian terraced viticulture in order to quantify the size of the phenomenon and the principal geographic localities, placed within a picture of historical development common to many of these areas.

2. Historical premises

Nowadays, the Italian agricultural terraced[1] landscape appears clearly reduced[2] when we compare it to the situation in the aftermath of World War II, less than a century ago. If for centuries the Italian mountains con-

[1] By agricultural terraces we mean only ones supported by dry stone: therefore excluded are embankments by rammed earth or grass, different in their nature, origin, technical skills necessary and maintenance burdens.

[2] Nowadays, 169,000 ha of terracing would be recognizable from photographic analysis, terrestrial and aerial (Varotto *et al.*, 2019b: 30).

tinued to be affected by the incisive work of anthropic transformation of the slopes' natural characters, just a few decades has been able to wipe out most of all this, through a widespread process of abandonment and a rapid rewilding. This phenomenon is typical of the entire Mediterranean area, but with different intensities and timings. It is closely related to industrial growth on plain, valley floors and coastline, and its migratory flows. It has thus been a transversal process, with a territorial, demographic, economic and social nature. The brutal changeover, from a traditional – medieval and modern – agriculture to an industrial and contemporary one, has led progressively to a marginalization of many terraced areas, almost always unsuited to mechanization (Bonardi & Varotto, 2016: 85-86).

This process has widely involved terraced wine-growing too; however, in most cases, the results have not been as harsh as in the other types of terraced crops, such as cereals or fruit-growing, once very widespread on terracing. Wine-growing and olive-growing remain the larger and more cohesive productive terracing systems in Italy. Among the Italian main terracing systems that are still active, the most important exception to the monopolistic role of wine- and olive-growing is the Gresta Valley, in the Southern Trentino. There, horticultural terraces still extend for about 120 ha[3], reaching the significant altitude of 1,200 m a.s.l (Baldi, 2002).

In fact, today, the most extensive areas of terraced viticulture are mostly linked to production of quality, the outcome of a gradual specialization gained by experience. It is interesting to observe how today's larger wine-growing terraced regions have historically benefited from commercial production, for a national or international market. In all probability, the better and earlier they placed themselves on the market, with quality and a strong specialization, the more positively they resisted the crisis that struck European terraced wine-growing from the end of the nineteenth century (Bonardi, 2019: 21-22).

For example, in many Alpine areas, the cultivation of the vine was positively affected by regional and international business opportunities. The wine-growing terracings of Valtellina (Scaramellini, 2014) and Aosta Valley (Moreno, 2012: 171-172) are indebted to their position close to the Swiss Cantons to which they exported wine. Valtellina, in particular, was favoured by belonging to the Three Leagues (1512-1797): this allowed its wine to penetrate deeper into the German world, not only Alpine but also continental. The same applied to the Cembra Valley, towards Southern German (Bavaria and Swabia) (Falcetti *et al.*, 1992: 62).

In much the same way, the extensive coastal, insular or even micro-insular terraced wine-growing[4] systems benefited from the Mediterranean Sea as a trade and communication route. From this perspective the relationship between terraced wine-growing and the water environment was essential, ensuring the possibility of transporting wine for long distances, following the most important historic routes (Bonardi, 2019: 14-15). In some specific territorial contexts, a key role was played by the direct provision of wine to the military and commercial navies: that was the case of Etna (Sicily), whose production between the eighteenth and the nineteenth centuries was directed towards trade with the British, French and Austro-Hungarian Navies (CERVIM). Moreover, in several cases wine produced on terraced vineyards was partly intended for foreign trade even from the Middle Ages: for example, as early as from the eleventh century, the Cinque Terre was exporting wine on Genoese ships as far as Flanders and England (Storti, 2004: 216, 342). In the first half of the nineteenth century, more than half of the wine produced found its outlet in foreign trade (Storti, 2004: 354). In this way, wine was very often the driving force for the improvement of terraced sites.

The centuries-old inclusion inside free markets placed these areas – well in advance – in a competition system at regional or even European level. This allowed developing and establishing forms of quality improvement and protection; furthermore, it also allowed a strong specialization, built around the increasing selection of specific grape variety.

In these contexts, the diminution of vineyard terraced surfaces was relatively more contained, despite the uncountable problems that arose before the mid-nineteenth century, both from significant grapevine diseases (*Oidium*, *peronospora* and – above all, from 1879[5] – *phylloxera*) and from economic and social structural limits (lower profitability than plain production, properties pulverization, work-force emigration, residential and touristic pressure…).

By contrast, the gradual affirmation of an exchange economy weakened those contexts designed for domestic production. The latest phases have seen the almost complete disappearance of those terraced vineyards not sufficiently specialized. An exemplary case from a recent study can be offered by Larian wine-growing and this example can be easily reflected in many other parts of Italy.

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[3] "I paesaggi in trasformazione del Trentino" (URL: http://www.paesaggideltrentino.it/i-paesaggi-agricoli-del-trentino/orticoltura/).

[4] At the same time, this relationship is not limited to wine-growing, but is also part of other specialised crops, such as olive tree and citrus plants (Ferrigni, 2011).

[5] *Phylloxera* was attested for the first time in Italy in 1879 in Valmadrera, near Lecco (on Como Lake), although it had probably been already present since 1874-75 (Direz. G. Agr., 1881: 166-167), arising in different periods depending on the geographical and productive context, still up to the Twenties of Twentieth Century (Bonardi, 2014b). However, it should be observed that these phytosanitary diseases do not permanently change the productive assets on the national scale (Bonardi, 2014a; Jacquet & Bourgeon, 2010), but are limited sometimes to hastening the abandonment process only at local or regional level (Bonardi, 2019: 19).

3. Methodology

The quantitative classification of Italian terraced viticulture is extremely complex for at least three reasons: 1) the absence, already cited, of research studies on a national basis is not compensated for by the total of studies of a local or regional character. Interest in the subject of terracing is in fact concentrated on a number of fields of a certain interest, leaving undiscovered many others of both equal and lesser geographical importance; 2) the few studies of a regional character do not always specify land use in detail (see for example the case of the atlas of terraced landscapes of Trentino, OPT, 2015; 2017; 2018; 2019a; 2019b), and so the extent of the entire terraced area effectively occupied by viticulture; 3) The lack of homogenous criteria by which a terrace is defined as such. In fact, the discrepancies lead to variable returns that cannot be mutually assimilated. The main problem, in this case, is due to the densities of terracing walls per unit of surface. It is clear that the situations are not precisely comparable when the cultivated area has a width of two to three metres (or even less), as is found for example in many parts of the Cinque Terre, and when it has a width of tens of metres, as in many parts of Valpolicella. Clearly, therefore, we lack a precise quantitative definition of the phenomenon of terracing.

In the light of this problem, the picture presented in this study should be considered provisional and not exhaustive, above all as regards the situation with scattered terracing. In this study, the twenty main Italian areas in which terraced viticulture is geographically compact are considered, generally of neighbouring communities, with surfaces greater than 10 hectares.

The data provided refers to or takes into consideration pre-existing studies held to be reliable and consistent with our findings, but in most cases it has been necessary to calculate or recalculate the surfaces on the basis of photo-cartography. For this purpose, the images available on a number of regional geo-portals and on Google Earth have been used (Figure 1). The different models of vine cultivation, in several cases difficult to distinguish from other types of cultivation, and the low quality of the images, make the exact recognition of the areas involved difficult, so introducing a further element of provisionality into the findings.

For each terraced area, the geographical background to which it belongs has been indicated, useful for understanding the reasons for their current survival in the light of the processes summarised in section 3.

4. Results

As shown in Table 1, with more than 900 hectares of still active wine-growing surfaces, Valtellina, in the central Alpine sector (Northern Lombardy), represents the most important Italian terraced system (Figure 2); the next largest, Cembra Valley, in central Trentino, is smaller by a third, with 600 hectares.

Other extensive terraced systems are those of Valpolicella, Chianti, the Lower Aosta Valley, the Amalfi Coast

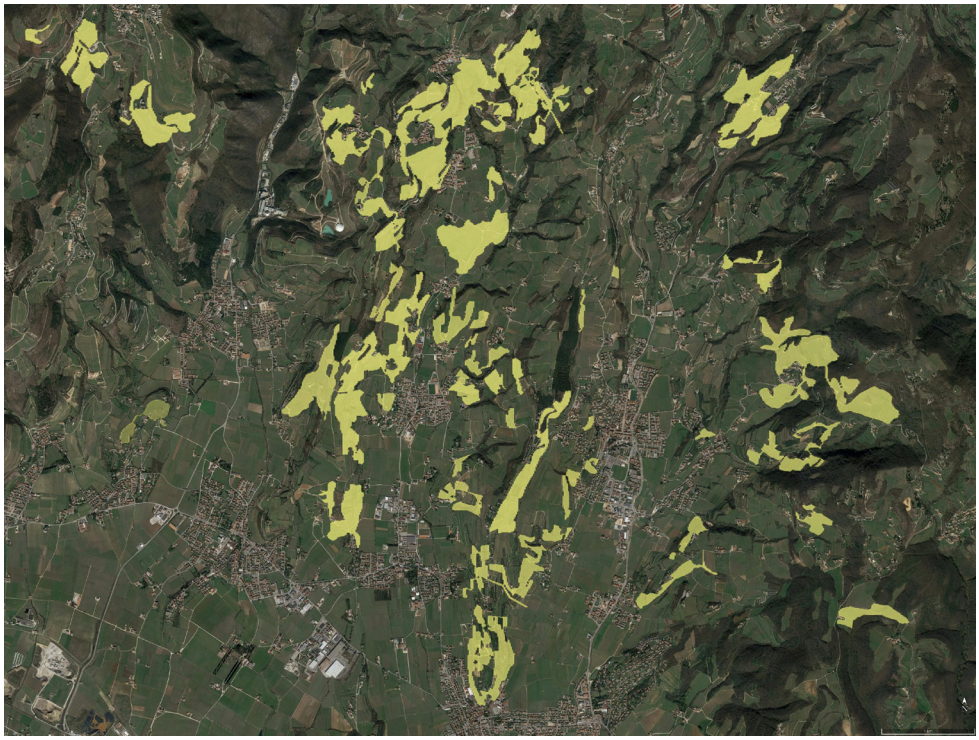

Figure 1: Distribution of the wine-growing terraced areas in a part of Valpolicella (VR).
Figure 1: Distribución de las zonas de terrazas vitícolas en un parte de la Valpolicella (VR).

and the Cinque Terre (Figure 3), the latter one of the most iconic regions of Italy, with a strong capacity for attracting tourism. In the case of the Amalfi Coast, it should be noted that viticulture only represents a marginal part of the total terracing, most of which is directed towards the production of citrus fruit.

Three out of the four island terraced areas identified in Table 1 have much the same size, of between 20 and 40 hectares. Pantelleria, in contrast, is on a different scale, which can be justified in its production, highly specialized around the *Moscato* and *Passito di Pantelleria*[6].

All the Italian terraced viticulture systems have been subject to a strong decrease in size over the last century. It is enough to think of the 4,700 hectares of terracing in Valtellina in the second half of the nineteenth century[7], of the 712 in the Cinque Terre (1929)[8] and the 612 in the Costa Viola (1929)[9].

Table 1: The principal Italian terraced viticulture areas. Unless otherwise specified in the notes, the extent of the areas come from the authors' surveys. The figures are rounded up: 0-5=5; 5,1-10=10.
Tabla 1: Las principales áreas de viticultura en terrazas italianas. A menos que se indique lo contrario en las notas, la extensión de las áreas ha sido medida por los autores. Cifras redondeadas: 0-5=5; 5,1-10=10.

N.	Wine-growing terracing areas	Administrative region	Current productive area (ha)	Geographical background
1	Lower Aosta Valley	Aosta Valley	130	Alpine
2	Canavese	Piedmont	120	Alpine / Pre-Alpine
3	South Piedmont (Alta Langa)	Piedmont	75	Hilly
4	Valtellina	Lombardy	880[10]	Alpine
5	Franciacorta	Lombardy	25	Pre-Alpine
6	Valpolicella	Veneto	475	Pre-Alpine
7	Cembra Valley	Trentino	600	Alpine
8	Vinschgau	Alto Adige	20	Alpine
9	Trieste Coast	Friuli-Venezia Giulia	15	Maritime
10	Western Ligurian (Valli di Ventimiglia)	Liguria	75	Pre-Alpine
11	Cinque Terre	Liguria	260[11]	Maritime
12	Chianti	Tuscany	350	Hilly
13	Giglio	Tuscany	20	Maritime / Insular
14	Ponza	Lazio	40	Maritime / Insular
15	Ischia	Campania	40	Maritime / Insular
16	Amalfi Coast	Campania	120	Maritime
17	Costa Viola	Calabria	130[12]	Maritime
18	Salina	Sicily	10	Maritime / Insular
19	Etna	Sicily	290[13]	Volcanic
20	Pantelleria	Sicily	500	Maritime / Insular
	Totale	Italy	4,175	

[6] In Pantelleria, as part of the commercial enhancement of wine production, several terraced vineyards have been part of a reconstruction project, starting from scratch, which has covered considerable surfaces in the island. Most of the time, the choice fell on thick double-escarpment walls, capable of offering strong resistance; at the same time, the ridge raised above the ground level acts as an embankment to the colluvial materials and contains the force of the wind (Bonardi &Varotto 2016: 107).

[7] The Commissione Ampelografica della Provincia di Sondrio (1880) identified 4,725 hectares of wine-growing areas on mountain slopes («in colle»): considering the Valtellina specific case, the datum can be directly referred to wine-growing on terracing. This calculation included the 692 hectares of neighbouring Valchiavenna, today reduced to only a few hectares.

[8] Terranova *et al.*, 2006.

[9] Nicolosi & Cambareri, 2007: 181.

[10] ISTAT 2019, www.istat.it. Dataset *« Coltivazioni » - Uva da Vino – Superficie totale in ettari.*

[11] Terranova *et al.*, 2006.

[12] Nicolosi & Cambareri, 2007: 181.

[13] Barbera *et al.*, 2009: 69.

Figure 2: Terracing in Valtellina (Central Alps) (photo Bonardi, 2015).
Figura 2: Terrazas en Valtellina (Alpes centrales) (foto Bonardi, 2015).

Figure 3: Terracing of Cinque Terre (Riomaggiore, Liguria) (photo Bonardi, 2013).
Figura 3: Terrazas en las Cinque Terre (Riomaggiore, Liguria) (foto Bonardi, 2013).

In Chianti, another region once heavily terraced, the current trend sees the vine take second place to the olive in terms of the area and production.

In its entirety the distribution of the Italian terraced viticulture systems reflects the general terraced systems observed in Bonardi & Varotto (2016), with a development mainly along two arc macro-systems (Figure 4). The first of these – the Alpine and Pre-Alpine one – stretches from the Aosta Valley to the Adige basin; the second one affects large stretches of the Tyrrhenian coast, from Liguria to Calabria. Within this second macro-system, are included also Sicily and the tiny Tyrrhenian islands, full of terraces as Giglio Island (Figure 5). While some isolated units of local terracing remain excluded, this scheme synthetizes quite clearly Italian terracing.

Starting from the data presented in Table 1, the main viticulture terraced areas were calculated as a proportional percentage of the total viticulture surfaces of the respective provinces and regions, according to the ISTAT 2019 data. The results highlight widely diverse situations: from where the role of terracing is significant, as in the Lower Aosta Valley (27.6%), with its traditional wine-growing system ("Pergola Valdostana")[14] and the Cinque Terre (26% in the province and 13.7% in the region), to those where it has a marginal role, as for example in Vinschgau, Salina or in the Alta Langa.

For three regions – Aosta Valley, Lombardy, Sicily – it was possible to calculate the total regional data

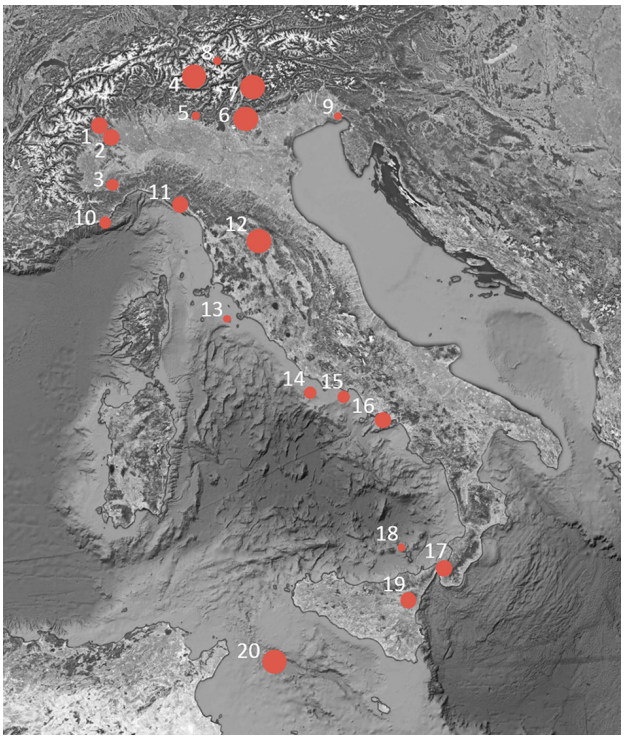

Figure 4: Localisation of the principal Italian terraced viticulture landscapes (numbering: see Table 1).
Figura 4: Localización de los principales paisajes de la viticultura italiana en terrazas (numeración: ver Tabla 1).

Figure 5: Terraces on Giglio Island (Tuscany) (photo Bonardi, 2011).
Figura 5: Terrazas en la isla de Giglio (Toscana) (foto Bonardi, 2011).

[14] Bagnod *et al.*, 2020.

(Table 3), by also including the residual terraced surfaces. These last, few and of limited size, are the result of recent recovery actions, or more often are those which remain of a system that was once much more extensive. The calculation the terraced surfaces as a proportional percentage of the total of regional viticulture provides an additional key to the interpretation of the data of Table 2.

5. Discussion and weaknesses

Today as also in past centuries, one of the main problems afflicting terraced wine-growing is the extreme fragmentation of properties. We have defined this as the genetic matrix of the large part of Italian terracing (Bonardi, 2019: 20). So today it is necessary to overcome this problematic legacy, which is probably one of the

Table 2: The main viticulture terraced areas were calculated as a proportional percentage of the total viticulture surfaces of the respective provinces and regions).
Tabla 2: Las principales áreas de terrazas de viticultura en relación con las superficies totales de viticultura de las provincias y regiones respectivas.

N.	Wine-growing terracing areas	% of terraced surfaces in provincial viticulture		% of terraced surfaces in regional viticulture	
1	Lower Aosta Valley	Aosta	27.66	Aosta Valley	27.66
2	Canavese	Torino	11.17	Piedmont	0.28
3	South Piedmont (Alta Langa)	Cuneo / Asti	0.25	Piedmont	0.17
4	Valtellina	Sondrio	100	Lombardy	3.53
5	Franciacorta	Brescia	0.33	Lombardy	0.10
6	Valpolicella	Verona	1.60	Veneto	0.49
7	Cembra Valley	Trento	5.88	Trentino	3.81
8	Vinschgau	Bolzano	0.36	Alto Adige	0.13
9	Trieste Coast	Trieste	7.73	Friuli-Venezia Giulia	0.06
10	Western Ligurian (Valli di Ventimiglia)	Imperia	15.96	Liguria	3.98
11	Cinque Terre	La Spezia	26.00	Liguria	13.79
12	Chianti	Firenze / Siena / Arezzo	0.83	Tuscany	0.60
13	Giglio	Grosseto	0.24	Tuscany	0.03
14	Ponza	Latina	0.94	Lazio	0.20
15	Ischia	Napoli	1.93	Campania	0.16
16	Amalfi Coast	Salerno	2.81	Campania	0.47
17	Costa Viola	Reggio Calabria	10.00	Calabria	1.47
18	Salina	Messina	0.50	Sicily	0.01
19	Etna	Catania	14.50	Sicily	0.28
20	Pantelleria	Trapani	0.93	Sicily	0.38

Table 3: Overall terraced viticulture in three Italian regions.
Tabla 3: Viticultura en terrazas en tres regiones italianas.

Administrative region	Main areas (tab. 1) (ha)	Secondary areas (estimation) (ha)	Total area (ha)	% of terraced surfaces in regional viticulture
Aosta Valley	130	30	160	34.04
Lombardy	880	60	940	3.77
Sicily	800	70[15]	870	0.84

[15] Barbera *et al.*, 2009: 91, 112, 125, 144.

main challenges facing current terracing policies, unfortunately largely ignored by politicians and the policies pursued. The only few exceptions are those re-unification attempts, born within some specific local projects[16]. At central state level and at decentralized regional ones, these areas have suffered from the complete absence of strategic direction and long-term vision: in this way, actions and financial resources are often squandered without effect[17] (Bonardi & Varotto, 2016: 105).

In 2016, the Italian Parliament approved an organic discipline on vine cultivation (L. 238/2016), in which not only wine and the vines, but also the wine-growing territories are recognized as a national cultural heritage to be protected and enhanced, as the specific result of work, skills, knowledge practices and traditions. As part of this vision, the State undertakes to promote restoration, recovery maintenance and safeguarding of the vineyards of the areas exposed to hydrogeological risk or with particular landscape, historical and environmental value (*heroic* or *historical vineyards*; L. 238/2016, art. 7). According to the outline of the ministerial decree (still in progress in mid-2019), those vineyards are considered heroic which are located:

- in areas with hydrogeological risk;
- in areas where the orographic conditions create difficulties for mechanic cultivation;
- in areas of particular landscape or environmental value;
- in small islands.

Except for the last case (small islands) and for those areas already identified by regional landscape plans, in addition to these parameters the heroic vineyard must possess a ground slope greater than 30%, or average altitude greater than 500 meters a.s.l. (with the exclusion of vineyards located on a plateau); alternatively, they must be made on terracing or embankments.

On the other hand, those vineyards are considered historical whose cultivation:

- dates back to a year prior to 1960 (found from land registers);
- is carried out with traditional practices and techniques, in compliance with the local physical and climatic characteristics.

In addition to these, vineyards are automatically considered historical if they belong to the wine-growing landscapes recognized by UNESCO, registered in the National Register of Historical Rural Landscapes or identified by landscape plans for the protection of specific wine-growing territories.

Although the respective required parameters seem to strongly tighten the validity of the definitions, they are actually guilty of an excessive laxity which threatens to widen the recognition of historical or heroic vineyards out of all proportion, making it completely useless. In particular, for example, for a country like Italy where the wine-growing tradition has lasted for centuries and indeed millennia, it is ridiculous to use 1960 as the time horizon to define a vineyard as historical. In this perspective, it becomes almost more difficult to find a vineyard without this requirement, if we consider the very wide spread of the vine in Italy, right up to the early twentieth century. If the legislator does not confront issues of this type, any legislative provision intended to support and enhance a specific type of winegrowing will inevitably result in a practise completely devoid of positive feedback.

Safeguard and support policies become impossible with such wide and lax requirements. From this point of view, we should recognise that the priority is the identification of stringent parameters that allow effective and timely interventions, rather than the launch of new further forms of theoretical acknowledgment, for which – even if you wanted – there could never be the necessary resources for all potential beneficiaries. A serious – and truly sustainable policy – would be to first identify the various terraced areas and secondly to study them from a current and historical point of view, in relation to the income potential, the risk of hydrogeological instability and the historical or iconic landscape value (Tarolli *et al.*, 2014). A number of relevant examples of studies in this sense have been carried out on the terraced systems of Valtellina (Camera *et al.*, 2014) and the Cinque Terre (Brandolini, 2017). It is fundamental that a requirement should – always and punctually – be the actual economic return of the investment, in order to intervene in support only of those contexts that can have a concrete perspective in front of them.

However, knowledge and studies in general are missing: existing studies are mostly local – or very local – and uncorrelated to each other. Often what is missing is a precise vision of the phenomenon on a regional scale[18]: just think, for example, of the lack of regional inventories of terraced landscape, which makes any detailed intervention – or just assessment – enormously difficult. This lack also makes it impossible to identify those fragments deserving of specific conservation interventions, as representative of larger sets due to their historical and geographical meanings.

[16] Among the various experience, we recall the programme "Conservare e valorizzare il paesaggio culturale della Media Valtellina", developed by the mountain community Valtellina of Tirano for the municipalities of Grosotto and Sernio (Studio di ingegneria AC-FM, 2017).

[17] It also deserves to be remembered the various enhancement and restoration initiatives, locally developed and later abandoned, such as some restoration actions developed in Province of Sondrio.

[18] An exception may be the work done on Sicily by Barbera *et al.* (2009) and on Trentino by OPT (Osservatorio del Paesaggio Trentino), with the terraced landscape atlas of that region (OPT, 2015; 2017; 2018; 2019a; 2019b).

On the other hand, we must also be careful given that one of the main weaknesess, always underestimated, appears when the productive dimension ends up overwhelming all the others. To facilitate the mechanization of viticulture, sometimes we end up witnessing the dismantling of the terraced areas, as locally in Valtellina or the Cembra Valley, where on slopes with limited inclination, the small dry-stone walls have sometimes been replaced by grass embankments (Bonardi, 2008: 32).

The prevalent postmodern trend is to consider these spaces in relation to secondary externals such as aesthetic and tourist use, as well as the ecological and environmental ecosystem, including the keeping of the slopes. All this contributes at best to a general recognition of these spaces as endowed with contemporary interest. By contrast, the factor of production does not always play the central role in policy as it should, being the key – and the fundamental – element that makes possible all others, decreeing the effective sustainability of the system. In residual terracing wine-growing, a fundamental role is played by the selection of peculiar grape varieties for the needs and circumstances of the specific territory. Island viticulture often reaches a high quality production tied to peculiar grape varieties, whose stories sometimes intertwine with each other. Particularly significant in this aspect is the story of the grape varieties of Ponza, introduced in the eighteenth century from Ischia during the repopulation period, which today are the basis of the typical and renowned Pontine wines (Gallia, 2018).

Even in a historical phase in which there is a progressive return of interest among young people in viticulture and traditional agricultural practices, it seems that policies are not able to direct support actions more promptly, taking advantage of this trend. In a certain sense, it looks as if politics is more concerned with self-celebration of the national or international recognition. From this perspective, the increasing tendency to 'heritagization' on the existing landscape finds its apotheosis with entry into the UNESCO World Heritage List[19] (Brandolini, 2017; Kladnik *et al.*, 2017). However, especially in the first case, the recognition conferred by the insertion of a terraced landscape into a historical heritage circuit, leaves all the related problems unresolved and induces new ones. This is particularly evident when instead of being enhanced as the historical product of the relationship and the interaction between humankind and its natural environment – always peculiar and with always different shades – the heritage recognition changes the infinite variety of spontaneous forms into stereotypes, packaged for optimal global tourist enjoyment[20].

6. Conclusions

The recent additional values attributed to terracing, and in particular to terraced viticulture, that go beyond the strictly economic and productive aspects, neither justify in any way a change of course, nor offer realistic tools to put into practice. Despite good intentions, terraced spaces are condemned to remain marginal spaces by the current socio-economic system. The same actions that aim to consider the present evidence – in most cases –have no true effects, due to lack of coordination and the absence of a broader perspective in these actions might be placed. The obvious impossibility of conducting large-scale interventions should not cause interventions to remain random: on the contrary, it should guide them within a wider vision, supported by adequate knowledge and in-depth study of the territory and its real needs, problems and potential. From this point of view, an unprecedented approach could be offered by the collection and sharing of historical information which can be collected on the local scale. Considering the fundamental importance of terracing in terms of preventing hydrogeological instability, its historical map should likewise be fundamental, in order to orientate actions, supervision and prevention more efficiently (Pepe *et al.*, 2019). This rereading of historic information to be applied to a current perspective could help to orient more concretely the possible present policies, experimenting with actions that manage to combine all terracing aspects and values, to achieve greater profitability of crops and also aesthetic restoration of the landscape, limited to where this can be meaningful (Stanchi *et al.*, 2012, Galve *et al.*, 2016). In this perspective, moreover, it has been observed how in a number of areas the erosive processes can contribute to give life to landscapes characterised by tourist attraction and so of economic importance (Brandolini *et al.*, 2018b).

For its part, alone, landscape 'heritagization' is just a label: it can also be a valid starting point to new and structured actions on terraced areas apparently recognized as being of greater environmental value, but it cannot be the point of arrival or the goal towards which every possible effort is oriented. Chasing what is nothing other than a fact – or a simple statement – such as the saving

[19] They are entered in the UNESCO World Heritage List Cinque Terre (1997; CONF 208 VIII.C), Amalfi Coast (1997; CONF 208 VIII.C), Aeolian Islands (1999; CONF 209 VIII.B) and Etna (2014; 37 COM 8B.15); into the UNESCO Intangible Cultural Heritage Lists we the traditional agricultural practice of cultivating the head-trained bush vines (*vite ad alberello*) of Pantelleria (2014; 9 COM 10.21) and the transnational art of dry stone walling, knowledge and techniques (2018; 13 COM 10.b.10). We also report the unique case of the San Martino vineyard in Naples, a 7.5 ha agricultural portion survived within a highly urban context, inserted in the UNESCO site of Historic Centre of Naples (1995; CONF 203 VIII.C.1; Gravagnuolo *et al.*, 2018: 273-274).

[20] To further the specific problems and contradiction of the approach to landscape of the UNESCO World Heritage List, look at Pettenati, 2019: 122-128, and more overall to his work in general.

solution to all problems will only aggravate them, when it leaves them without timely response, dispersing energies that otherwise could be more concretely invested elsewhere. Without a clear vision of sustainability of the terraced spaces – which is, first of all, social and economic, not only theoretical – any recognition will not prevent good vineyards from continuing to be abandoned or from collapsing by crumbling without the certainty of being restored.

From this, it's possible to rethink the role and the possibilities about terraced wine-growing areas, accepting that the historical dimension will remain only history.

This summarised attempt to restore a comprehensive picture of Italian terraced viticulture, in addition to representing a basis for further study, moves in the direction of that need for understanding, repeatedly emphasised, at the foundation of every action of intervention.

Author contributions

The article is the result of work carried out by both authors and shared reflections; both authors have fully concurred with the findings. For what concerns the layout of the text, Chapters 1 and 3 were written by Luca Bonardi; Chapters 2 and 5 by Davide Mastrovito. Chapters 4 and 6 were curated by both.

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