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Original article

Integrity in UNESCO World Heritage Sites. A comparative study for rural landscapes

Paola Gullino^{a,*}, Federica Larcher^b

^a Department of Agronomy, Forest and Land management, University of Turin, Via Leonardo da Vinci 44, Grugliasco (TO), Italy

^b Department of Agronomy, Forest and Land management, University of Turin, Via Leonardo da Vinci 44, Grugliasco (TO), Italy

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ABSTRACT

Since 2005, Outstanding Universal Value (OUV) is the standard by which United Nations Educational Scientific and Cultural Organization (UNESCO) evaluates world cultural heritage site suitability. The sites worthy of UNESCO preservation as well as the parameters used to demonstrate OUV are diverse. Our study focused on the uniquely distinguished rural landscape sites and the OUV parameter of integrity. Integrity however, is an elusive concept for which UNESCO provides no definitional protocol, and for which the scientific community objects to a static or pure historical interpretation. Given this, our work aims to analyse the concept of integrity and how it can be used to preserve the heritage of rural landscapes. After reviewing the UNESCO approach, we focused on the international scientific debate on the meaning and application of integrity. We designed and conducted a comparative study of UNESCO rural landscapes selected from the 2011 World Heritage List. Documents describing the historical, rural, and agro-ecological features of each of the fourteen rural sites were analysed. From this, several historical and ecological parameters were chosen as “values to have” and several socio-economic and management parameters were chosen as “values to maintain” to assess the integrity of each landscape. Our results found integrity to be a value of both cultural and natural landscapes and that it is key to site identity. We demonstrated that UNESCO assigns a high value to the following parameters: historical features, traditional crops and local products, land-use and agricultural practice permanence, and the presence of architecture related to agricultural activity. Finally, we found the relationship between culture and nature to characterize best the integrity of a rural landscape, rather than nature or culture alone.

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1. Research aim

Landscapes play an important role in the multifunctional development of agriculture. Landscape is considered as an integrating concept that refers both to a physical reality that originates from the continuous and dynamic interaction of natural processes and human activity, and to immaterial existential values and symbols that the landscape embodies [1]. Throughout the world, landscapes are non-static features and places that define peoples' livelihoods, identities, and belief systems [2]. Based on these qualities, United Nations Educational Scientific and Cultural Organization (UNESCO) has recognized many rural landscapes around the globe as cultural heritages and deemed them to be of Outstanding Universal Value (OUV). The diversity among these landscapes results from land-use variations that have been overlaid, refined, and replaced throughout history [3]. Following the introduction of the OUV statement

in 2005, each site is required to demonstrate its integrity. As Landorf explained, key World Heritage concepts such as integrity, authenticity, and cultural significance remain vague and undefined [4]. Our paper seeks to elucidate integrity further by building on PhD research on the concept relative to cultural landscape heritage preservation [5], and then extending the evaluation through a comparative study of UNESCO rural landscapes.

2. Introduction

2.1. UNESCO context

In 1962, the UNESCO Recommendation concerning the safeguarding of the beauty and character of landscapes and sites [6] defined two concepts that would guide World Heritage List (WHL) nomination, which were preservation of the beauty and character of the landscape and the protection of natural and rural landscapes. This international document, defined as a source of social welfare, underscored the linkage between rural landscapes and agricultural production [7]. The 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage (WHC) [8] was held to

* Corresponding author.

E-mail addresses: paola.gullino@unito.it (P. Gullino), federica.larcher@unito.it (F. Larcher).

ensure identification, protection, conservation, presentation, and transmission to future generations of the cultural and natural heritage of OUV. To accomplish this, they issued a unique international instrument to recognize and protect both cultural and natural heritages. A significant step was taken during the WHC when UNESCO formally recognised management of World Heritage Sites (WHS), and produced a document that defined “cultural heritage” as monuments, groups of buildings, and sites (Article 1). “Natural heritage” was defined as natural features (physical and biological formations), geological and physiographical formations, and natural sites (natural areas) (Article 2). Article 1 further described landscapes as properties that represented the “combined works of nature and of man” illustrative of the evolution of human society and settlement over time, under the influence of physical constraints and/or opportunities presented by the natural environment and of successive social, economic, and cultural forces, both external and internal. In this context, rural landscapes are cultural landscapes and considered the result of consecutive land reorganizations.

Another fundamental step in UNESCO policy was the Declaration of Budapest adopted in 2002 [9], which established the need for and importance of management planning for each site. The policy helped to identify the best practices, strategies, and measures for the protection and preservation of the universal value of a site over time [10]. In this context, integrity maintenance of a site over time is not only made a priority, but also that policies to bind the protected area to economic and social activities would be adopted. In the interest of developing sustainable management plans, many studies were conducted [11,12].

In 2005, the UNESCO World Heritage Committee, tasked with assessing property suitability for cultural heritage, introduced integrity as a site qualifier. Since then, integrity has become a priority for list inscription, deemed an essential quality during the nomination iter, and if approved, part of – successful management [13].

In the Operational Guidelines for the Implementation of the WHC [14], integrity is defined as “a measure of the wholeness and intactness of the natural and/or cultural heritage and its attributes. Examining the conditions of integrity, therefore requires assessing the extent to which the property:

- includes all elements necessary to express its outstanding universal value;
- is of adequate size to ensure the complete representation of the features and processes which convey the property’s significance;
- suffers from adverse effects of development and/or neglect.”

While integrity was introduced only recently (2005), it was an implicit quality for many cultural properties even before it was formally named [15]. Clearly, no roadmap exists on how to evaluate integrity, or if it is even possible to look at integrity in rural landscapes. According to Antrop [16], these landscapes are the result of a continuous land reorganization – to adapt their use and spatial structure to the changing societal demands. Landscape is considered a synthetic and integrating concept in which material and immaterial values co-exist. Furthermore, UNESCO’s traditional agricultural and agroforestry landscapes are characterised by low-intensity systems and land management activities, providing a high degree of multifunctionality in terms of ecosystem services.

2.2. The concept of integrity as discussed by the international scientific community

A review of the research published in recent years exposed many different concerns about the elusive concept of integrity. Although integrity, like authenticity, completeness, and entirety is often used in assessment tools, the problem is not limited to definition, but it

also relates to theoretical, methodological, and experimental work at different levels [17].

The scientific community agrees with a multidisciplinary and integrated approach to integrity, not one based on pure historical interpretation [18–20]. Tress et al., Duff et al., and Culotta et al. [21–23] suggest that landscape analysis be based on a global view of all processes, such as natural phenomena and their relationship to man and his environment. Not surprisingly, the concept of integrity among the myriad of parameters used in such analysis is a quality valued by not only UNESCO, but also by the International Union for Conservation of Nature (IUCN) and others. In the case of the IUCN, protected areas are of sub-national and national importance, in contrast to the World Heritage cultural landscapes that are of universal importance. Nonetheless, both organizations focus their site protection on conservation of integrated natural and cultural heritages spatially. In fact, many listed World Heritage cultural landscapes hold considerable conservation value for their biodiversity [24]. Therefore, one could extrapolate and define integrity as the state of site and resource conservation and the level of evolutionary process consistency, congruity, and completeness of any transformations observed over time [25].

Historical analysis is another tool that has been used to evaluate integrity. Farina (2002), recommends historical studies to understand the dynamics of landscape change to inform future planning [26]. For instance, cultural landscape integrity might be evaluated by comparing the parameters used to name cultural heritage landscapes during past decades [27]. Pearson et al. have gone further and suggested that the integrity of historical places could be both measured and classified [28]. Gullino et al., Marigani et al., and Käyhkö et al. have each demonstrated that juxtaposing cadastral maps and historical document data with modern cartography and aerial images can help to characterise a local landscape and its historical range of variability. Consequently, these tools inform landscape modifications across time [29–31]. Finally, by combining qualitative and indicator-based comparisons, spatial patterns and ecological processes are quantified and an assessment of the integrity of a landscape [32] is attained. Indicators of integrity are particularly valuable for measuring landscape biological conditions; that is, those largely unaffected by human activity. While few pristine landscapes remain, the notion of integrity provides a point of reference based on historical data by which to compare present conditions to landscapes that have been minimally impacted by modern humans. Rapport et al. [33] applied the concepts of integrity and health to landscape evaluations. In addition, they identified indicators of integrity to measure biological elements related to landscapes largely unaffected by human activity. McCosker and Rolfe [34] defined ecosystem health as an overall indicator of ecosystem function or ecosystem integrity that considered both ecological and human processes. Their methodology used several consistent and reliable criteria that are transparent, objective, and scientifically defensible for analyzing ecological value.

Living rural landscape integrity is difficult to define and to examine because of man’s continuous land changes for production purposes. However, it is generally accepted that rural landscapes, together with historical sites, can express different types of integrity. For example, agro-ecosystem functional integrity is defined as maintaining ecological services, sustenance, and reproduction of soil, in addition to other functional elements [35]. Another type of integrity, ecosystem integrity, is related to the concept of resilience and is defined as the essential self-organizing capacity within ecosystems to create structures and gradients during their natural development [36]. However, most studies of landscape values generally refer to an integrity criterion that encompasses coherence, harmony, visual balance, undisturbed functional entities, continuity over time, and the fit of land-use to natural characteristics [37]. Within these varied contexts, we have

Table 1
Description of the six (i–vi) main UNESCO inscription criteria for cultural heritage.

Inscription criteria for cultural heritage	
(i)	To represent a masterpiece of human creative genius
(ii)	To exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design
(iii)	To bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared
(iv)	To be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history
(v)	To be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change
(vi)	To be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance (The Committee considers that this criterion should preferably be used in conjunction with other criteria)

sought to understand how UNESCO has interpreted integrity by conducting a comparative study of rural landscape site properties.

3. The comparative study

Currently, 176 state parties have endorsed the WHC. As of November 2011, the WHL included 936 properties (725 cultural, 183 natural, and 28 mixed) located in 153 countries [38].

Table 1 lists the six main criteria to assess the OUV of cultural landscapes; these same criteria are also used for rural landscape evaluation. List review indicates that all the criteria consider human activity, but each from a different perspective [39]. Of note is criterion (v), which examines the interaction between man and environment inclusive of traditional human settlement and specific land-use characteristics representative of a culture. In fact, most rural landscapes submitted for WHL recognition are analysed against this criterion.

To analyse the UNESCO concept of integrity for rural landscapes [40], all sites within this category in the 2011 WHL were identified. All documents related to the selected sites, including the Nomination Files, were studied to identify their historical, rural, social, and agro-ecological features. In order to perform a proper comparison, we developed a list of parameters based on the definitions of integrity discussed previously. For the parameter definition, we identified those elements of value still recognizable in the landscape over time that created the landscape structure. Utilising a holistic process, we considered and evaluated several features that combined different approaches. Mazzino [41] has proposed experimental study that uses parameters useful to both rural and urban landscape characterisation. For methodological approaches to select landscape character indicators as part of a wider European concept, Haines-Young and Potschin [42] constructed a specific indicator to understand landscape changes on a European scale. Last, Peano and Cassatella expressed the need to apply landscape character indicators that capture the more holistic landscape properties [43].

Analysis of the Nomination Files published for each UNESCO site resulted in our application of some of these to evaluate the integrity concept. Our study used a combination of developed historical, ecological, socio-economic, and management parameters

[44]. Selected parameters and their descriptions and codes are reported in Table 2.

Parameter choice was managed with the consideration of some non-homogeneity of the available data to optimise the comparison.

Considering that rural landscape integrity is a “value to have” based on the level of cultural value continuity and on the level of natural value conservation, we developed a list of historical (H) and ecological (E) parameters. For the historical analysis, we identified four parameters that considered presence of architectures or buildings, land-use, and crops (H1, H2, H3, H4). Three parameters were chosen for the ecological analysis that assessed their natural layout, heterogeneity of the agro-mosaic, and the buffer zone influence (E1, E2, E3). The presence of natural elements in rural landscapes is, in fact, an indicator of the level of connectivity. This quality is very important for the biodiversity conservation and for the stability and integrity of ecosystems [45]. Authors Decout and Luque, after considering habitat sustainability and migratory bird species network, associated integrity with the planning aspects of ecological studies.

Given that integrity is a “value to maintain” based on the self-organizing capacity of ecosystems and on the level of land-use transformation congruity, several socio-economic (S) and management (M) parameters were chosen. According to UNESCO, the socio-economic sustainability of the agricultural system is important for maintaining integrity; therefore, the presence of a link between crops and people was also analysed (S1, S2, S3).

Finally, one parameter was included to denote the presence of management rules and strategies within or without a specific management plan for conservation of integrity over time (M1).

Further analysis of the Nomination Files and many annual reports caused us to determine and assign each parameter a value on a range scale between 1 (low) and 3 (high) relative to their significance [34].

To understand better the meaning of integrity in rural sites and its evolution over time, results from each parameter evaluation were matched. As previously affirmed, integrity is a concept used in various scientific contexts, so we considered the cumulative “weight” of different parameters types on the UNESCO final decision. An integrated analysis of selected parameters made it possible to identify the most characterizing features of each rural landscape.

4. Results

Today, 14 rural landscapes with OUV are included in the WHL. Table 3 reports the site name, country, inscription year, nomination criteria, main crop, and property surface for each rural world heritage site. Only the core zone (the protected area) of each property was considered.

For these rural sites, the interaction between man and his natural environment was considered as the unique universal value. Each of these sites is recognized as a cultural heritage for its distinctive agricultural system. In particular, Portovenere, Cinque Terre and Islands (PT), Jurisdiction of Saint Emilion (SE), Alto Douro Region (AD), Tockaj Wine Region historic cultural landscape (T), Landscape of the Pico Island Vineyard Culture (PI), and Lavaux vineyard terraces (L) are all characterised by vineyard cultivation. Other landscapes such as the rice terraces of Philippine Cordilleras (PC), Viñales Valley (VV), the Archaeological Landscape of the first coffee cultivations (CC) and the Agave Landscape and ancient industrial facilities of tequila (AT) are, respectively, characterized by main crops of rice, tobacco, coffee, and agave. Finally, Wachau Cultural landscape (W), Agricultural Landscape of Southern Öland (SO), Fertő/Neusiedlersee cultural landscape (FN), and Val d'Orcia (VO) are notable for their mixed agriculture.

Table 2

Name, description, and code of each parameter chose for comparing UNESCO rural landscapes.

Parameter	Description	Code
Architectural layout	Presence of buildings, monuments and architectures with an important and worldwide recognizable historical value not necessarily related to the rural matrix	H1
Rural layout	Presence of architectures with an important and worldwide recognizable historical value related to the rural activity (terraces, dry-stone wall)	H2
Traditional land-uses	Presence of traditional practices and techniques which aren't generally part of the modern agriculture linked to the level of mechanization	H3
Traditional crops and products	Presence of traditional crops, otherwise of crop permanences which were generally part of the historical production system	H4
Natural layout	Presence of natural elements (species, habitats, ecosystems) with an important and worldwide recognizable conservation value	E1
Agro-mosaic heterogeneity	Presence of a land-use variety in contrast with the monoculture	E2
Buffer zone influence	Presence of a significant buffer zone (the surrounding area) in relation with the core zone (the protected area)	E3
Cultural value	Presence of a traditional link between the main crop and the local population culture	S1
Social sustainability	Presence of a link between the main crop and the local population employment	S2
Economical sustainability	Presence of a link between the main crop and the local economical resources	S3
Management strategies	Presence of management rules and strategies within or without a specific management plan	M1

Table 3

Site name (abbreviation), country, inscription year, criteria, main crop, and property (ha) of the 14 rural World Heritage Sites.

Site name (abbreviation)	Country	Year	Criteria	Main crop	Property ^b (ha)
The rice terraces of Philippine Cordilleras (PC)	Philippines	1995	(iii) (iv) (v)	Rice	– ^a
Portovenere, Cinque Terre and Islands (PT)	Italy	1997	(ii) (iv) (v)	Vineyard	4,69
Viñales Valley (VV)	Cuba	1999	(iv)	Tobacco	–
Jurisdiction of Saint Emilion (SE)	France	1999	(iii) (iv)	Vineyard	7,85
Agricultural Landscape of Southern Öland (SO)	Sweden	2000	(iv) (v)	Mixed	–
Archaeological landscape of first cultivations of coffee (CC)	Cuba	2000	(iii) (iv)	Coffee	81,47
Wachau Cultural Landscape (W)	Austria	2000	(ii) (iv)	Mixed	18,39
Alto Douro Wine Region (AD)	Portugal	2001	(iii) (iv) (v)	Vineyard	24,60
Fertő/Neusiedlersee cultural landscape (FN)	Austria-Hungary	2001	(v)	Mixed	52,00
Tockaj Wine Region historic cultural landscape (T)	Hungary	2002	(iii) (v)	Vineyard	13,25
Landscape of the Pico Island Vineyard Culture (PI)	Portugal	2004	(iii) (v)	Vineyard	190,00
Val d'Orcia (VO)	Italy	2004	(iv) (vi)	Mixed	61,19
Agave landscape and ancient industrial facilities of tequila (AT)	Mexico	2006	(ii) (iv) (v) (vi)	Agave	35,02
Lavaux, vineyards terraces (L)	Switzerland	2007	(ii) (iv) (v)	Vineyard	8,98

^a Value not available.^b Core zone surface.

From the Nomination Files of rural sites recognized after 2005 (AT and L), we formulated a distinct idea of the integrity each was assumed to possess. In the case of the other sites established prior to 2005, our evaluation was indirect. Despite the same UNESCO protocol being applied during the period analysed (1995 to 2011), the documents differed relative to each other, and so did our parameters used to make the comparative study effective. The kind of information provided by Nomination files is descriptive. As said previously, the presented methodology accounts for varying information availability and different UNESCO site properties.

Application of the parameters allowed analysis of the integrity concept within these rural landscapes. As said previously, historical and ecological parameters ensure integrity [46], while the socio-economic and management parameters explain how this primary condition is maintained [47].

Table 4 reports the assigned values for each parameter of the 14 rural sites, in which the more relevant type of parameters is identifiable. Assignment of a score to each highlighted the differentness of each UNESCO site. For example, Saint Emilion (SE), Wachau (W), and Val d'Orcia (VO) were characterised by the presence of historical buildings, monuments, or complexes not specifically related to rural land-use (H1). It is not uncommon for many protected UNESCO sites to include a large area or even towns, cities, and villages. In fact, the protected core area of Aquitaine Région (SE) includes ancient churches and historical monasteries built during the 6th century.

When crop type was considered, some traditional ones (vineyards, coffee, rice, and tobacco) were linked to specific historical rural architectures or land arrangements (H2). For this reason, UNESCO considered stone terraces or dry-stone walls as priority elements for preservation of the rural layout. Stone terraces and ponds, and the rice production system, based on harvesting water from the forest clad mountain tops, represented the main reason for inscription of the Philippines (PC), the first rural site to be included in the WHL. Similarly, the rural architectures in Lavaux (L) are considered historical memories of man's labour and an outstanding example of past land-use.

Traditional land-use (H3) and traditional crops and products (H4) were the most important parameters to all sites except for the natural site of Fertő/Neusiedlersee (FN). Located in southeast Cuba, the area of Santiago and Guantanamo (CC) is where the first 19th coffee plantation was sowed. Unlike other sites, CC is protected for two reasons: coffee cultivation and its historical rural agronomic techniques. This indicates that this parameter also took into account the level of mechanization. In fact, today in Viñales Valley (VV), as in past centuries, its cultivation of tobacco cultivation utilises the same traditional agronomic manual plant care and harvesting techniques.

Other sites also show that traditional crop (rice, tobacco) and typical product (wine, tequila, port wine) preservation was considered (H4). Blue agave (AT) has been extensively cultivated in Mexico since the late 16th century. In this region, the agave landscape of regular rows interspersed with annual crops, such as

Table 4

Values assigned to the 14 rural landscape sites for each parameter.

Site	Parameter code										
	H1	H2	H3	H4	E1	E2	E3	S1	S2	S3	M1
PC	1	3	3	3	2	3	– ^a	2	3	1	1
PT	2	3	2	2	2	3	–	3	2	2	2
VV	1	2	1	3	3	1	–	3	3	2	2
SE	3	1	2	3	2	2	1	3	2	3	3
SO	2	1	2	2	3	3	–	2	2	3	2
CC	1	3	3	3	3	2	–	3	3	1	2
W	3	1	2	2	3	1	1	1	1	2	2
AD	2	3	2	3	2	1	2	2	2	3	3
FN	2	2	1	1	3	2	2	1	1	2	2
T	2	3	3	3	1	1	3	2	2	3	3
PI	1	3	3	3	1	2	3	2	3	2	3
VO	3	2	2	3	3	3	2	2	1	3	2
AT	1	3	2	2	3	2	2	3	3	2	3
L	2	3	2	2	1	1	2	2	2	3	3

1 low; 2 medium; 3 high value.

^a Value not available; Table 2.

corn, is part of the national identity. Together, cultivated blue agave lands and related distilleries, taken together, are an outstanding example of distinct architectural complexes that illustrate the fusion of technology and local culture.

Some rural sites also demonstrate important natural and ecological values. The Fertö/Neusiedlersee (FN) and Wachau (W) sites include a lake and river, respectively, as parts of the agro-ecosystems. They protect the flora and fauna diversity (E1). Other rural sites (PC, PT, VV, SO, and VO) are distinct for their high heterogeneity in land-use, an aspect directly linked to biodiversity (E2).

Existing buffer zones and their extension around core-protected zone is also an important conservation indicator (E3). We observed that while buffer zones were not considered in early rural sites, they became significant in later years. In fact, in Tockaj region (T), the buffer zone is larger than the core zone which demonstrates the relevance of the surroundings to inner value protection.

In terms of socio-economic parameters, cultural value was found to be the most important UNESCO parameter because the resulting landscape represents community identity, a sediment of civilization, and a brainchild of the people who organized and promoted the area. In all of the studied rural sites, there is a link between the rural landscape and the local population and culture (S1). Both Portovenere and Cinque Terre (PT) in Italy are considered cultural sites of outstanding value because of their harmonious interaction between people and nature. This interaction produced landscapes of exceptional scenic quality that illustrated a traditional way of life that existed for a thousand years and continues to play an important socio-economic role in the life of this community today.

Agriculture is vital to rural landscapes. In sites PC, PI, VV, CC, and AT, it is the most important local employer (S2). On Pico Island (PI) in the Azores archipelago (Portugal), traditional vine cultivation and local population life rely on each other. The core zone includes villages, houses, farms, and distilleries as well as all the social organization that rests with wine production. Alternatively, in SE, SO, AD, T, VO, and L, agriculture is the most important economic activity (S3) of the area. In the Portuguese Alto Douro Region (AD), port wine production, known for more than 2000 years, is its most important economic resource and is sold worldwide. Given the complexity of the rules to safeguard and protect sites, we chose to consider briefly only those related to the protection and management of agricultural practices strategies applied over time (M1). Maintaining integrity long term is possible with proper management plans. Sites inscribed after the Budapest Declaration (AT and L) contained defined strategies within their management plans,

while others (SE, AD, T, and PI) standardized their production quotas to make it economically sustainable. In such cases, integrity is indirectly preserved.

5. Discussion and conclusions

Each traditional landscape expresses a unique sense or spirit of place (*genius loci*) that defines its identity [16]. Integrity is a value belonging to both cultural and natural landscapes that facilitates the recognition of their identities. When looking for integrity in natural properties, the International Union for Conservation of Nature (IUCN) looks for evidence of protection and effective management policies that retain or restore essential landscape qualities [48]. On the other hand, World Heritage sites must demonstrate their integrity, a vague concept.

This study takes a step toward understanding integrity and how UNESCO views it. The comparative study of rural landscapes highlighted that, for inscription into the WHL, historical features are most significant. The presence of traditional crops and local products, the permanence of historical land-uses and agricultural practices, and the presence of architectures related to agricultural activity, are considered by UNESCO to be the most important markers of integrity. Even though UNESCO sites differ greatly relative to each other, maintenance of the primary historical cultivation is the most significant cultural value to preserve and protect. Nevertheless, problems persist on how best to quantify the threshold of traditional elements or historical permanences, let alone their relative meaning, on an integrity scale.

Simultaneously, integrity maintenance over time raises the importance of social and economic parameters. Only a management plan and long-term legislative, regulatory, or institutional protection and historical characteristics are preserved over time. Selman underlined that the objective of landscape planning should be to reinstate “virtuous circles” between natural-cultural and social-economic capitals [49], which does not automatically mean reproduction of inherited landscapes. Rather, it suggests that self-reinforcing links will be key to conservation, re-creation, and restoration of distinctiveness. In some cases, this might well entail the conservation of traditional farming practices and products; elsewhere, it could be based on contemporary innovations, such as localised production and biomass energy consumption. An important long-term benefit of the inclusion of cultural landscapes under the WHC is promotion of a greater awareness of landscape issues generally, and of cultural landscapes in particular [50].

Consistent with McCosker and Rolfe [34] and utilising the parameter identification and score assignment method in this

study, it is possible to estimate the magnitude and direction of landscape change to biodiversity value resulting from land-use change. The study explains how results from an interdisciplinary approach can contribute to the local planning and global conservation of UNESCO sites. Recently, Chang et al. [51] expressed desire to understand landscape integrity of rural area ecosystems using cross-scale research. Despite the topic difference, they outlined the need for new strategies and approaches addressed in response to scale changes. In our study, even though the value assigned to parameters was based on descriptive data, results show this cross-scale method to be promising for UNESCO rural landscape evaluation. Our methodology could be used for future WHL application and inscription because it allows characterisation and comparison of several rural areas by identifying the relative importance of landscape elements as integrity markers. As suggested by Pungetti [52], our study confirmed that maintaining the socio-economic integrity through cultural landscapes, traditional land-use and sustainable development is also essential for biodiversity conservation. Ensuring integrity is a primary condition for UNESCO: understanding the relative weight of each parameter will be useful both locally and globally. Moreover, planners must be aware of characteristics that are likely to change to manage the landscape. Consequently, many UNESCO sites have adopted strategic actions to promote land development capable of ensuring the nature of good over time. Landscape parameter evaluation allows identification of specific measures applied by UNESCO. For example, historical parameters that can measure traditional vineyard maintenance or rural layout exist in Pico Island, Lavaux and Cinque Terre. To reduce the risk of abandonment of agricultural land, and consequently local product market collapse of some endangered products, the UNESCO Commission has used economic farm support systems (Pico Islands). For instance, ecological parameters exist in Valle d'Orcia and Southern Öland to measure the promotion the heterogeneity of the agromosaic. In Tockay region, socio-economic parameters for the wine production and market are regulated by production protocols.

In conclusion, we can state that the integrity of the relationship between culture and nature matters most in rural landscapes, not integrity of nature or culture alone. Landscapes are dynamic features. What remains unclear, however, is how the concept of integrity can assume a dynamic character, and moreover, if peoples' awareness changes through generations. It is likely that more than one type of integrity can be found per landscape. These are questions for further research.

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