

Production innovation and environmental protection in the management of rural landscapes: the UNESCO vineyard landscapes of Langhe-Roero and Monferrato

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Abstract. In Italy, the landscape appears more and more as the essential element of a sustainable economic development linked to environmental peculiarities and food excellence. In agriculture, the winning aspect of production is no longer measured, in fact, in merely "organoleptic" terms, but also through the issues of environmental protection and care and careful landscape management, as a cornerstone of quality and typical products. In this regard, production - in a broad sense related to wellbeing and leisure, as well as wine - absolutely needs places identifying it, since its value is intimately connected with the quality of the original rural landscapes. These landscapes - that still today represent an element of strong characterization of the single territorial realities - are those that denote a balanced intervention of man on the natural elements; they are those that offer a clear presence of historical signs and legible links between structure and land use. In recent years, agriculture appears to be increasingly responsible for carrying out a plurality of functions, in addition to the acknowledged traditional ones. The maintenance of the hydrogeological structure, the preservation of landscapes with significant historical-cultural values, and the maintenance of biodiversity are all the more important. In this perspective, farmers can certainly contribute to conserving and effectively producing high quality landscapes, through a careful "care" of the land in which they work, so as to maintain and strengthen the characteristics of formal quality and historical identity, by avoiding scrupulously useless compromises. A case study of great interest to verify the concreteness and general applicability of this type of reasoning is represented in Piedmont by the territories of Langhe-Roero and Monferrato, recognized by UNESCO as a World Heritage Site in 2014, where there are interesting research and experimentation activities in the fields of agricultural sustainability and territorial planning.

1. What perspective for historical / traditional agricultural landscapes?

Piedmont, and particularly the hilly area of Langhe-Roero and Monferrato, has been one of the most singular and culturally relevant landscapes over time on an international level and is defined by grapevine cultivation. The importance of this heritage is such that it has rightly obtained the high international recognition by UNESCO, as a "World Heritage Site", becoming a positive factor for sustainable growth of the territory. The 1972 UNESCO World Heritage Convention strongly established the principle that each State (...) *recognises that the duty of ensuring the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage (...) and situated on its territory, belongs primarily to that State. It will do all it can to this end, to the utmost of its own resources and, where appropriate, with any international assistance and co-operation (...).*

The challenge for these territories appears to be the need to combine the protection of the landscape heritage with the continuation of production activities that are often in need of modern adaptation to new technological

processes, and the use of equipment and machinery that are completely different to that of the past. From this perspective, an in-depth knowledge of the cultural techniques of the past appears to be fundamental in order to evaluate the extent to which these can be maintained, potentially with public financial support, recognising their great identity value for the local communities and for the expectations of tourists and visitors who have been attracted by the UNESCO recognition. The importance of traditional knowledge in agriculture, was fully recognised in the 2001 UNESCO Convention on "Cultural Diversity", which underlines the need for it to be protected, especially in the fields of environmental and natural resource management, in order to foster synergies with modern science. The historic and laborious activity of humans in hillside farming is clearly legible in the wine-growing landscapes of the Piedmont region, even in the impenetrable hills of the Langhe. This is work that even today can be seen in the lines of fields, ditches and massive interventions for the settlement of the hills.

The beauty and originality of these UNESCO agricultural landscapes derives precisely from the orderly succession of rows, from the organisation of the territory according to geometric forms, regularly

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repeated from one hill to another, according to peculiar patterns, due to the careful hydraulic-agrarian arrangements of the slopes. Among these, the so-called "girappoggio" (contour farming) stands out, characterised by the singular arrangement of the rows according to the level curves of the hilly fronts which represent - in terms of singularity - one of the cardinal motivations for the recognition of universal value by UNESCO. In other words, it is an agrarian landscape, not only the result of deep-rooted productive activities, but primarily the expression of "culture in the agronomic field", inspired by a wise management of the territory that has been able to preserve it in the past from serious threats to its stability. From this point of view, the agricultural landscape of Langhe-Roero and Monferrato encompasses an important value of memory, and is testimony to the ancient relationship between humans and nature in the continuous reinterpretation of the potential of the territory [1]. Unfortunately, the increasingly pressing needs of the mechanisation of vineyards have overturned the traditional and consolidated hydraulic-agrarian setting of the vineyards through the adoption of "rittochino" arrangements distinguished by the layout of rows following the lines of the maximum slope of the vineyards, with a general distortion of the landscape compared to traditional historical versions. In this juxtaposition of tradition and modernity, a recent provision by the Piedmontese Regional Government has been inserted with foresight which, thanks to specific financial measures for the restructuring and conversion of the vineyards, has foreseen the inadmissibility to economic contribution of the vineyards with a rittochino setting.

2. Agriculture. What role?

Tying a product to a territory is a response to the current trends of travelling consumers, who seek a combination of landscape, culture, and a richness of food and wine [2]. In this context, a good landscape must be attractive and, therefore, harmonious and tidy, but not monotonous. Food and wine itineraries, such as the Roads of Wines and Flavours, demonstrate the success of the attempts to raise consumer awareness of quality products, thus enhancing regional agricultural production. The "Astesana - Wine Route" stands out in UNESCO Piedmont winemaking; for a long time, along with many initiatives for territorial promotion, it has been creating an innovative "culture of wine" by promoting knowledge of the numerous historical farms present along pre-established routes. These are routes designed to optimize the usability of the wine-growing areas, where important natural and cultural values persist, such as vineyards and cellars of single or associated farms open to the public in a setting of prestigious landscape, historical and artistic attractions. In this perspective, more and more winemakers are beginning to combine wine production with the offer of leisure services, such as tasting of farm products and accommodation on the farm. A vineyard landscape of quality must display the clear characteristics of rurality,

understood as a balanced combination of natural elements and anthropic presence. It is fundamental that the farmers, but also the professionals (agronomists, architects, engineers, etc.) and the public administrators, must agree on the rules required to produce landscapes that are suitable frames for "good food". In addition to its traditional work, the agricultural sector is best suited to carrying out many functions, from the maintenance of the maintenance of the hydrogeological structure to the conservation of landscapes with significant historical and cultural values, and the maintenance of biodiversity [3]. Winemakers can effectively contribute to conserving and producing high-quality landscapes in a profitable way, through the thoughtful "care" of the territory in which they operate, so as to maintain and strengthen the features of formal quality and historical identity, scrupulously avoiding any useless compromise.

3. The importance of agronomic science

The contribution of research and experimentation in the agricultural, and particularly in the winegrowing, fields are vital, in order to achieve these important objectives of environmental sustainability. There are a number of issues that are of great concern in this regard, including for the population not directly involved in the primary productive sector. These include the use of herbicides to control weeds in vineyards, and a series of plant protection products for the control of pathogens and pests. There are some very interesting models for controlled vineyard greening as alternatives to chemical weeding, and in the tillage of the land along the rows to limit the vast water runoff and surface erosion of the land. The adoption of completely alternative solutions to today's phytosanitary practices still seems problematic, including due to the recent spread of very worrying grapevine diseases such as Golden Flavescence, and many experiments have long been underway.

4. Rural police regulations

In order to direct the evolution of the wine-growing areas towards greater environmental sustainability, the rural police regulations have recently been revised and updated in light of the new quality expectations of agricultural production and the proper management of territories. A very interesting example in this regard is the complete re-elaboration by the province of Asti in 2016 of its own regulations, aimed at achieving environmental protection objectives in agricultural areas, without however hampering production activities. This includes safeguarding agricultural land to prevent erosion and instability at the same time as maintaining local roads in good condition. A particular emphasis is placed on the prescription of the use of naturalistic engineering techniques - as an alternative to traditional reinforced concrete structures - capable of ensuring the greater environmental compatibility of works for securing the hilly slopes and the hydrographic network, and this has also had good results from an aesthetic point of view. Other innovative rules of great interest concern

the management of cultivated fields with respect to the property boundaries, with particular reference to the vineyards, with the aim of avoiding incorrect mechanical working of the land which may compromise rainwater drainage networks. These, and many other rules of great practical and managerial interest for agrarian land, have been the result of an innovative interprofessional working table specifically designed by the Province of Asti which saw a fruitful collaboration between agronomists, engineers, geologists, architects and professional colleges of land surveyors and agrotechnicians.

5. University training

The long-term sustainability of cropped lands, and particularly the UNESCO areas of Langhe-Roero and Monferrato, has led in recent years to profitable university collaborations both in terms of research and teaching within the academic areas of agricultural science, and landscape planning and design. An important example is the twenty-year collaboration between the two Turin universities (University and Politecnico). Both are founding members of the UNISCAPE European Network, currently including over 50 European universities involved in the implementation of the European Landscape Convention in their training and experimentation programmes. On the teaching front, it is worth mentioning the inter-university specialist degree in "*Parks, Gardens and Green Areas*" introduced by both universities over a decade ago, which took over the inter-university Master's Degree that had also involved the Universities of Genoa and Milan, in "*Green Areas and Landscape Design*". It is a set of activities that clearly shows a convergence of intentions and interests in the themes of the landscape.

6. Conclusions

In the logic of the sustainability of territorial transformations, planning at different scales must necessarily pay attention to the landscape, enhancing the elements of singularity, identity and equilibrium and at the same time preventing transformations that are the source of imbalance and dissonance [4]. These policies cannot, however, be merely defensive in nature, but must be characterised by a strong design intention to remove the structural reasons for deterioration and pursue new and advanced balances between the different economic-social needs and the specificities of environmental features. It is therefore essential that the actions of safeguarding and enhancing the cultivated, and in particular the winegrowing, landscapes of the UNESCO areas of Piedmont may be conveniently undertaken through the effective involvement of local communities, with particular reference to winemakers, but also the academic world, the professions, including agronomists, architects and other categories of various subjects interested in this specific theme, and public administrators, in order to define the most useful and

advanced models of governance for each situation, in the spirit of the European Landscape Convention

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