Interpretation of Agricultural Landscape in the Metropolitan Fringe of Barcelona: Analysis on the Vineyard Landscape of Plana de Penedès, Catalonia (Spain)

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I. Introduction

Plana de Penedès (Plain of Penedès) is one of the peri-urban agricultural spaces located at the metropolitan fringe of Barcelona in Spain (Figure 1), whose landscape is characterized by the monoculture of vine: Penedès is one of the traditional and principal wine-producing regions in Spain, known especially by the elaboration of cava (Spanish sparkling wine). However, suffering from the urban pressure of Barcelona, this region has experienced remarkable transformation both in the environment and in landscape in recent decades (Busquets 2006; Busquets et al. 2009).

Faced with these critical situations, people come to rethink the significance of their traditional landscape as a key element of their quality of life and well-being, as resource of great value for territorial development, and as common assets which generate a local identity. Around the year 2000, mobilizing private and public entities, social movements occurred in Penedès region for the preservation of vineyard landscape, which led to the creation of Landscape Charter of Alt Penedès in 2004 (Saito, 2011). Derived from these movements, several projects and activities in tourism and education have developed aiming at the raising-awareness of people towards landscape, such as creation of wine footpath routes, landscape education project in the municipality of Subirats (Saito, 2015).  

While pursuing these movements and observing that interests and respects of people toward landscape grew, the author wondered if a simple but essential question had been well-discussed among them: “What is the landscape of Penedès like?”: what characteristics it has, how it has evolved until today, which attributes explain the uniqueness of landscape, how the image of

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1 On these subjects, the author gave some contributions in the previous workshops of Mediterranean Study group held in Trieste (2010) and in Rabat (2013).
Landscape is often defined as the visible representation of a territory, or “a portion of land” which we can perceive visually as geographical space. That is why the term landscape is sometimes used as a synonym of “scenery” especially referring to its aesthetic aspects. Landscapes are everywhere around us, nearly everything that we can see when we go outdoors (Lewis, 1979). As Ojeda Rivera (2013) expresses aptly, like texts, works of art, wines or coffee, landscapes can be read, admired or tasted by everyone.

On the other hand, as many landscape researchers assume, landscapes are indeed complex realities difficult to understand; composed of natural and cultural elements, which are arranged and superposed in a historical process. Furthermore, landscape should be understood not only as material realities, but as social constructions resulting from individual and social processes (Duncan and Duncan 2009, Nogué 2007).

To discuss the complexity of landscape is not the purpose of this article, nor is it of great issue for most people to think about it when they look at landscape. However, due to its complexity, the interpretation of landscape and its translation in a familiar language will be a great help for us to understand in depth the landscape, as if we could enjoy and taste a lot more, texts, works of art, and wines or coffee with the explanations by mediators (Ojeda Rivera, 2013).

The importance of interpretation of landscape has been discussed in previous studies especially in terms of awareness-raising, where some methodological approaches have developed. An example is the Spatial Codes project developed by Takenaka (2016). They proposed Spatial Codes as an instrument to recognize the tangible and intangible contexts which generate uniqueness of the city, based on the experiences of transdisciplinary researches on Nakagawa Canal (Nagoya, in Japan). For Nakagawa Canal, they discovered twelve codes organized in three categories: landscape, civil agents, and space for linking. As for landscape, it is suggestive for our research that, even though they analyzed urban landscape, they paid much attention to natural conditions, such as geomorphological and hydrographic factors, as the frames which configure urban morphology.

Another instructive approach is found in a series of works by Ojeda Rivera. Ojeda Ribera et al. (2018), for example, offers a hermeneutic and transdisciplinary reading to understand the olive grove landscape of Andalusia (Spain). As well as they explain objective forms of landscape analyzing visible components and attributes, they intend to show emotions and perceptions that arouse in those who experience landscape, by interpreting texts and phrases described for that landscape. Furthermore, by collaborating with artists, they employ several pictures painted in different olive groves of Andalusia as a way to communicate a complex reality of landscape.

Other prominent work directed by Ojeda Rivera is a collection of “Landscape Notebooks (Cuadernos de Paisaje)”, published as diffusion media of different landscapes in Andalusia.²

² Until today, four volumes have been published: “Fachadas marítimas de Cádiz (Maritime facades of Cádiz)”, “Doñana, el paisaje relatado (Doñana, the narrated landscape)”, “Pasear Sevilla. El espíritu
Here again they emphasis on the role of artists (painters and writers) to interpret and visualize landscapes. Based on the analysis of works of art and literature (pictures, essays, poems, etc.), they propose some itineraries through which we could enjoy the landscapes. Further, their collaborating artists express in texts or in sketches what they experienced thorough the itinerary.

II. Objectives and methods

Inspired by these studies, we attempt to interpret and visualize characteristics of the landscape of Plana de Penedès, with a final goal to illustrate the factors which endow uniqueness or individuality to the landscape. As the first step, this research starts from the analysis focused on the physical dimensions of landscape, that is, on the morphology of landscape that we can perceive visually: Here we will not refer to the subjective dimensions such as perceptions, emotions, memories, etc., while recognizing that these aspects are so important to the analysis of landscape.

At first, in order to understand the characteristics and to identify the elements which constitute the landscape, we employed the documents of the Landscape Catalogues of Catalonia (Catálegs de Paisatge de Catalunya). The Landscape Catalogues are technical documents elaborated by the Landscape Observatory of Catalonia (Observatori del Paisatge de Catalunya) as an instrument to introduce landscape quality objectives into territorial and spatial planning. With the aim of encompassing all the landscapes in Catalonia, the territory is divided into 135 landscapes (technically called landscape units) (Figure 2). Plana de Penedès is one of the landscape units identified there. In the Catalogue, individual document is prepared for each unit (Figure 3), which offer us valuable and useful information: distinctive traits of each landscape unit (natural, cultural, dynamic); natural elements constituting the landscape; historical evolution; landscape today; artistic expression of the landscape; landscape values; principal routes and points of observation and enjoyment of the landscape; current landscape dynamic; possible future evolution of the landscape; landscape evaluation; landscape quality objectives; measures and proposed actions.

By analyzing the descriptions of the Landscape Catalogue, we obtained general details of the landscape of Plana de Penedès and extracted the elements which configured the landscape. After that, identifying the locations of landscape elements in the topographical maps, we conducted field survey in September 2015 at different sites in Plana de Penedès. In the field survey, we...
observed features of landscape focusing especially on the spatial organization of different kind of landscape elements. All photos carried in this paper are taken by the author during the survey.

**III. Singularity of the landscape of Plana de Penedès**

While we can find vineyard landscapes in many places of Spain, the case of Plana de Penedès shows some particularities that distinguish it from the others.

**Geographical location:** Penedès is a peri-urban agricultural area located at the metropolitan fringe of Barcelona (Figure 1), whose capital Vilafranca del Penedès is at about 40km from Barcelona. Affected by the extensive growth of Barcelona, residential zones have expanded increasingly from the 1960s, notably in the peripheries of towns such as Vilafranca and Sant Sadurní d’Anoia (the second town of the region), occupying agricultural lands, in many cases vineyards. Establishment of industrial complexes and large warehouses also accelerated in the same period.

**Topographical features:** Plana de Penedès lies in the Prelitoral Depression formed between two coastal mountain ranges (the Prelitoral and Litoral Mountains). This flat land facilitated development of agriculture, but at the same time, construction of transportation infrastructure (railways, freeways etc.) so-called “Prelitoral Corridor”, through which major flows of people and goods between Barcelona and coastal cities as Tarragona are produced. This is one of the important factors which boosted the process of urbanization and industrialization mentioned before.

**Land use:** Nonetheless, despite the proximity to Barcelona, vast extent of croplands has still been conserved in Plana de Penedès, comparing with other parts of the Metropolitan area of Barcelona. For instance, el Vallès, located equally in the Prelitoral Depression on the left side of the Llobregat River, is now occupied completely with residential zones and industrial estates of larger dimension. In contrast, in Plana de Penedès, situated at the heart of the denominations of origin (DO) of Penedès and Cava, the vineyards continues occupying a great part of the cropland (approximately 80%). That is, the importance of wine industry has made it possible to maintain its traditional agricultural landscape.

As the result of all mentioned above, the landscape of Plana de Penedès today is “mosaic” one, formed by complexly arranged natural and human elements. From the descriptions on the landscape unit “Plana de Penedès” of the Landscape Catalogue, we extracted principal elements which compose the landscape, and drew a sketch to understand the spatial relations among them (Figure 4). As natural elements, we can see the silhouette of Montserrat mountain range on background (a), and a dominant pattern of undulation of terrain, which is highlighted by natural vegetation generated along the streams (c). As human elements, the most prominent is not to mention vineyards (b), but we can also observe rural settlements (d), network of rural roads which connect them (e), and rural architectures immersed in vineyards. We must pay attention
that, even describing this landscape “traditional” or “agricultural”, we can also find recent constructions such as transportation infrastructure (f), large warehouses and factories(g) as the elements which constitute the landscape of Penedès today.

IV. Analysis on the landscape elements of Plana de Penedès

Landscape elements of Plana de Penedès that we have read from the descriptions of the Landscape Catalogue are actually perceived at different spatial scale in the field, from a large to a micro scale. Here we conducted an analysis on some landscape elements by different spatial scale at which each element appears: a large-scale analysis (distant view of mountain ranges), a middle-scale analysis (gently wavy terrain, natural vegetation along the streams), a small-scale analysis (rural settlement system, patterns of vineyards), and a micro-scale analysis (rural architectures).

1. A large-scale analysis

An outstanding element which we can find at a large scale is a distant view of mountain ranges. Plana de Penedès is a tectonic fossa (a part of Prelitoral Depression) bounded by the Litoral and Prelitoral mountains, formed by the actions of various rivers that run through as the Foix river, the Anoia river and their affluents. So the topographical contrast between the plain and the mountains is quite clear (Figure 5).

This extensive plain provides us a wide perspective, giving a distant view of mountain ranges without any obstacles. For example, we can enjoy a splendid view of the Montserrat mountain from almost anywhere in the plain: in surroundings of Vilafranca del Penedès, a distant of 40km or more from the mountain, we can see its “saw-shape” outline quite clearly on a fine day (Photo 1).

The factor which enables us to have such a visual experience is shape of the basin (a bowl-shaped terrain of Plana de Penedès), for it offers us several viewpoints from which we can obtain a great perspective of the plain (Photo 2).

2. A middle-scale analysis

The elements included in a middle-scale analysis are those which are observed in the topographical map at 25,000 scale. Here we focused on two aspects: gently wavy terrain and natural vegetation along the streams.

Although we call “plana (plain)”, Plana de Penedès is not absolutely flat, but is a slightly undulating plain, with small hills isolated by differential erosion phenomena in some places. This wavy landform of the plain is an element which endows continuity, rhythm and individuality to the landscape.

The elements which accentuate the undulation of land are the patches of natural vegetation
generated along the streams. Plana de Penedès is covered by numerous torrents and streams, which flow relatively in parallel in the direction of the mountain-bottom of the basin, shaped like fish bones (Figure 6). Even though almost all torrents and streams are intermittent or temporary, natural vegetation composed of various species developed along them. This natural vegetation plays an important role in enhancing the contrast between valleys and hills on the plain, breaking the monotony of the vineyard landscape (Photo 3).

3. A small-scale analysis

The elements analyzed at a small-scale are what can be perceived from several hundred meters away. Here we centered on the rural settlement system and patterns of vineyards.

Except for Vilafranca del Penedès, towns and villages of Plana de Penedès are small settlements of purely rural character. These agglomerations of houses, which lived by the agriculture in surrounding lands, form veïnats rurals. Veïnats rurals are traditional settlements found typically in Penedès region that developed around the street with clustered or linear structure (Figure 7). The compact shape of settlement, with the vineyard in the background, contributes to express the silhouette of villages (Photo 4).

The presence of large extension of vineyards has great relevance to the perception of landscape in Plana de Penedès. A great part of vineyards is of small and medium-sized exploitation, based on a traditional land ownership system in Catalonia (rabassa morta4). As for the organization of vineyards, there are a great variety of patterns in their plots, regular or irregular form, rectangular or oval-shaped. Some plots have an “organic” form, as a result of adapting the natural conditions in situ (Photo 5).

The factors which determine the plantation design in Plana de Penedès would be topographical conditions (slightly undulating terrain), hydrological system (torrents and streams) mentioned before, and a dense network of rural roads that structures the flat part of the plain.

4. A micro-scale analysis

As the elements included in a micro-scale analysis, there can be more than one. In the description of Landscape Catalogue, architectures of different types and of different periods are enumerated, such historical heritages as churches and hermitages, castles and towers, fortified houses, wineries and houses of modernisme style etc…. Here we paid attention to rural architectures as representative ones. In many parts of Plana de Penedès, we can still find rural architectures such as masia (traditional Catalan rural house) (Photo 6) and constructions of pedras secas (dry stones) immersed in vineyards. Above all, constructions of pedras secas, for example, walls of pedras secas that surrounded vineyards in old days, and barraques (cabins)

4 Rabassa morta was a type of farm contract widespread in Catalonia, whereby a farmer was given a piece of land to cultivate vines in it while two thirds of the vines he planted lived there. In return, he had to give the owner a part of his annual harvest.
that served as a storage of equipment or sometimes as a shelter in a sudden rain are valuable heritages that tell us the farmers’ life in the past. They are essential elements which enrich the traditional agricultural landscape of Penedès (Photo 7).

V. Concluding remarks

In this article we tried to interpret and visualize the landscape of Plana de Penedès by identifying the elements which constitute it and examining the spatial organization among them. Figure 8 shows the synthesis of the analysis of landscape elements at different spatial scale.

We think that the uniqueness of the landscape of Plana de Penedès consists in the fact that it is a landscape “with thickness”, formed by the accumulation of several layers superposed over time (Figure 8). Even though it is somewhat in a rough way, we can consider these layers correspond to the analytical spatial scales employed in this study. Indeed, the landscape elements observed at a larger scale were established before those observed at a smaller scale.

As Takenaka (2016) pointed out in the case of Nakagawa Canal, natural elements observed at a large and middle scales (topographical relief, hydrological system, etc.) are decisive factors in configuring large structures. These factors in turn determine the organization of cultural components (network of roads, patterns of vineyards, rural constructions, etc.), added later by human actions to their physical surroundings. The result of this interaction between humans and natural environment is the creation of a “mosaic” landscape. While the landscape of Plana de Penedès is often defined as a landscape of monoculture of vine, it is not a monotonous but rather of great diversity, characterized by a rich harmony of natural and cultural components.

Landscape is not static, but it continues changing and evolving with socio-economic and environmental dynamics. As for the landscape of Plana de Penedès, the vineyard landscape that we see today, might be nothing but a landscape in transition from one phase to another, though it seems as if it were there since ever: while this vineyard landscape has been relatively stable in this region, it is only from the second half of the 19th century that this crop appeared as a predominant element of the landscape. The stability of landscape depends undoubtedly on the great importance of the wine production in Penedès as a local economic activity from that time. Another factor would be that, fortunately, recent developments have been concentrated in the southern part of the plain, especially along the transportation infrastructure.

The landscape of Plana de Penedès is “living” landscape which has developed on the incessant interactions between people and the territory through the traditional industry, that is, wine production. Then, what is important is not merely to conserve the landscape as a visual entity, but to maintain and cultivate the relationship between people and the territory which endows uniqueness to the landscape, especially in such a situation as in the metropolitan fringe of Barcelona where socio-economic changes are so rapid.

To discuss what the uniqueness of landscape is, it is essential first of all to understand the
characteristics and values inherent in the landscape, and to that end, to interpret and visualize that landscape as we have challenged in this study. Furthermore, when we discuss how to enrich the landscape, in other words, how to cultivate the relationship between people and the territory, approaches to the subjective dimensions of landscape would be indispensable, which leads to the question of landscape quality objectives, i.e., “What landscape would we want?”, the theme that we must take on in the next research.

Bibliography


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Figure 1  Geographical location of studied area (Plana de Penedès)
Source: Institut de Cartogràfic i Geològic de Catalunya

Figure 2  Map of 135 landscapes (landscape units) of Catalonia
Source: Observatori del Paisatge de Catalunya
Figure 3  A sample of individual documents of landscape unit in the Landscape Catalogue
Source: Observatori del Paisatge de Catalunya

Figure 4  Sketch of the landscape of Plana de Penedès
Source: Elaboration by the author
a) Montserrat mountain, b) vineyards, c) natural vegetation along the streams, d) rural settlement,
e) network of rural roads, f) transportation infrastructures, g) warehouses and factories
Figure 5  Topographic relief of the Metropolitan Area of Barcelona

Source: Institut de Cartogràfic i Geològic de Catalunya

Figure 6  Vineyards and natural vegetation along the streams in Plana de Penedès (Subirats)

Source: Institut de Cartogràfic i Geològic de Catalunya
Figure 7  Rural settlements dispersed in Plana de Penedès (Subirats)
Source: Institut de Cartogràfic i Geològic de Catalunya

Figure 8  Image of overlay of landscape elements in the case of Plana de Penedès
Source: Elaboration by the author
Photo 1  Silhouette of Montserrat mountain as a scenic background (Volvi del Penedès)

Photo 2  A Panoramic view of the plain from the hill of Sant Pau (Vilafranca del Penedès)

Photo 3  Vineyards accompanied by natural vegetation along the streams (Subirats)

Photo 4  Silhouette of a village with its surrounding vineyards (Sant Sebastià dels Gorgs)
Photo 5  Patterns of vineyards

left) Vineyard along the torrent, organized in terraced form (Viloví del Penedès)
right) Vineyard in the flat land, structured by rural roads (Vilafranca del Penedès)

Photo 6  Masia (Catalan rural house) surrounded by vineyards (Viloví del Penedès)

Photo 7  Constructions of pedras secas (Subirats)

left) Old walls that surrounded the vineyards
right) A shelter of pedras secas