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WHEN AGRICULTURE RULES OVER THE TERRITORY: DRYSTONE WALLS

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ABSTRACT

The objectives of this paper are mainly the dissemination of knowledge about drystone walls, a “minor heritage”, and the awareness of its importance in the territory characterization. These objectives are achieved when this theme is disclosed and explained. Heritage is protected and appreciated only if it is understood. The expected practical impact is essentially related to the recognition of this type of heritage. The main methodology consists of bibliographical and iconography collection, field surveys and exchange of ideas with the local people. The approach is made from the point of view of how the practiced agriculture characterizes the territory, not only its structure, because is also necessary to know the local typologies of drystone walls to allow to characterize them. Some characteristics of drystone walls were discovered in this investigation, which are directly related to the territory where they are inserted. The following limitations were found: the gradual replacement of drystone walls with masonry walls; changes in the type of agriculture; the difficulty of finding masters who have the know-how about drystone walls; the recognition of this heritage by the local population; and the gradual local population diminution. Practical implications are an improved sense of belonging and identity as the knowledge and appreciation of this heritage increases the pride of the population which was verified in the field surveys. The originality of this paper is the object of study, the Parish of Cernache do Bonjardim, Portugal, since there are very few works about it, also with added value to the dissemination of this type of heritage and its potential exploitation and protection by local population. It is possible to renew the territory of these walls and use it for touristic, educational and cultural purposes, encouraging the local economy.

1. INTRODUCTION

Drystone walls are walls made of stones that are fitted without any binder. Apparently, the stones appear randomly, however, the construction of these structures requires from the constructor a sense of balance and art in the laying of masonry, which is not straightforward [1]. In order to have some quality, the choice of stone type and the way the stone is placed on the wall is fundamental, forming a natural puzzle [2]. These walls - whether for partition of property or for support - are walls whose resistance relies on gravity, making it an ally; however, the way stones are interwoven with each other is of fundamental importance to their stability therefore the experience of the master is of prime importance.

The drystone buildings are part of the so-called “vernacular heritage”, still considered a “minor heritage”. However, this “minor heritage”, consisting of simple, seemingly unimportant elements, presents an inherent complexity from various points of view, which would not be expected in a “minor” heritage [2].

With the evolution of the concept of heritage, which is now based on the capacity of society to recognize the values of objects [3, 4], the vernacular heritage gradually emerges, taking its place and being recognized as such [5]. Therefore, heritage is now considered as a development resource, fostering identity, evidencing itself as a territorial legacy and becoming an economic good [6].

The object of study of this paper is the parish of Cernache do Bonjardim, defined according to CAOP2011 (Organizational Administrative Charter of Portugal of 2011), in the interior of Portugal, middle zone (NUTS II), *Pinhal Interior Sul* (NUTS III), municipality of Sertã. NUTS are the Territorial Units for Statistical Purposes, defined by the European Union. The municipality of Sertã is administratively constituted by several parishes, including Cernache do Bonjardim, with an extension of about 7000 Ha and approximately 3000 inhabitants (Census 2011).

2. METHODOLOGY

In order to understand, describe and characterize the object of study with the aim to create a new knowledge about it (qualitative method, empirical methods [7]), the adopted methodology was the one currently used in this type of work: bibliographic, iconographic, photographic and cartographic research, comparison with existing works in different geographies, exchange of experiences with locals and with other researchers, as well as field surveys.

3. THE WALLS AND THE TERRITORY OF CERNACHE DO BONJARDIM'S PARISH

3.1. Drystone walls

Agriculture has always been very important for mankind's survival, especially after Men became sedentary. Religion, agriculture and meteorology were considered to be interconnected, as it is shown by the Romanesque frescoes of the church of San Isidro in León, Spain, which served as agricultural calendar. When Man began to have the need to leave the lowlands, the slopes appear as an alternative. Thus, it was necessary to find a solution that diminished the slope's inclination, avoided superficial erosion and that would sustain the lands [8]. The solution was the terraces, built in drystone. Consequently, they “*play a decisive role in the configuration of the rural landscape, showing perfectly the interactions of man with the environment*” (*ibid.*), that is, walls and terraces are a way of “*taming the territory*” and “*arranging the stone*” [9].

Terraces are typical of the Mediterranean basin, with rainforest crops such as the olive tree, but there are also terraces outside this geographical area, namely in the Alto Douro Vinhateiro in Portugal, Laveaux in Switzerland, or Bali in Indonesia, which are World Heritage Sites.

Continental Portugal has three climatic influences: the Atlantic climate on most of the West coast, the Continental coinciding with the interior to the East, and the Mediterranean coinciding with the South, so that the walls, directly related to climate and geology, present distinct characteristics.

However, the main reason for the existence of terraces is agriculture; this forms the orography, the landscape and is characteristic of the territory, ruling over it. The terraces with drystone walls are a topographical, water and food support, introducing a new element conceptually alien to the surrounding landscape, since they contain more moisture than the rest of the soil, favoring new economies and the development of some species in the terraces, that are strange to the culture, incrementing biodiversity [10]. Simultaneously, these walls are also a territorial reference, in the sense of joining and consolidating a large part of the landscape structure, becoming a cultural reference, being another point of connection between the place and its inhabitant (*ibid.*). They increase the sense of identity and of belonging, and define the image and character [11, 12], strengthening the connections between the past, the present and the future [13].

Terraces have several advantages: they increase the arable land and the area for construction, making useful apparently unusable slopes [11]. They allow to accumulate arable soil, in slopes where it would normally be eroded, permitting agricultural activities. This erosion usually results from the entrainment of soil by the rainwater flow, therefore a special territorial distribution of terraces is often found in order to reduce the flow velocity, controlling the water's percolation and retention time on the terrace [2]. However, in fieldwork carried out in the Algarvian Barrocal, soil support walls were found only with the function of the reduction of water erosion, where agriculture was impossible due to the sharp slope (*ibid.*). Terrace walls also serve as a destination for the stones removed from the agricultural area, as a construction material, keeping the fields clean.

The landscape of terraces is not exclusively composed of these: there are numerous elements built to support the agricultural activity, such as corrals, threshing floors, water systems and oil presses [8]. Being its maintenance difficult and having lost its agricultural use, deterioration has been increasing over time. Those that are still used are located close to the villages for reasons of easy access, quicken their maintenance and having an agricultural and pastoral use (*ibid.*). Terraced farms also function as a defense of settlements against forest fires. In Fig.1 one can clearly see the terraced area surrounding a village, after a huge forest fire that occurred in 1988.



Figure 1: Serra do Açor, Portugal (source: authors).

Drystone walls constitute a landscape that must be preserved. However, their gradual degradation, resulting of successive events (abandonment of agriculture with the consequent uncontrolled growth of the forest, population exodus, aging of the population, reduced size of plots), make farming difficult [8, 10, 14], so that their conversion to different uses [2, 10] is urgent, generating other economies, making

possible their reuse and valorization. It is for these reasons that there have been several programs of rehabilitation and revitalization of these landscapes, along with social revitalization.

One of the initial actions and perhaps the most important is the appreciation and social recognition of these spaces, so that they become attractive for those who want to enjoy them, encouraging their maintenance. In this perspective, tourism in rural areas, being exploited in a sustainable way, seems to be one of the solutions, fostering at the same time the preservation of this heritage [2, 8], since there will only be a future for these landscapes if there is a financial advantage, otherwise, they will continue to be abandoned, with the risk of their total disappearance from certain territories [10].

3.2. Cernache do Bonjardim's parish

For those who visit the parish of Cernache do Bonjardim in a superficial or passing way, it seems, at first glance, not to have a heritage worth of mentioning. However, the work of Gonçalves [11] demonstrates the opposite.

In 1905, Teixeira [15] described the surrounding area of the village of Cernache, thus: *“The hills that delimit their wide horizon are covered in part by pine and chestnut trees forests, while on their steep slopes olive trees stand supported by terraces. Through the greenery of the meadows and the darkness of the pine forests, roads are like wide white ribbons rounding the hills and descending to the fields that they cross, uniting the villages”*. Although part of this landscape has been lost with the successive replacement of olive groves by pine forests, and these by eucalyptus trees, and also with the destruction by forest fires (mainly June 2017), this description refers to the existence of mountain ranges and already reveals the existence of terraces, being the landscape of this parish dominated by the orography, the fields of cultivation, terraces, the trellises (*latadas*) defining the limits of properties (Fig.2) and the water lines [11].



Figure 2: Example of a *latada* as the limitation of paths and properties (source: authors).

Parque Bom Jardim, already known in the fourteenth century, gave rise to the settlement of Cernache do Bonjardim [15]. Parish created on January 5, 1544; in 1725 it was the main parish of the Priory of Crato (*ibid.*) and, on August 20, 1955, its seat was elevated to the rank of village. This parish is the second most populous of the county of Sertã, according to the Census of 2011, having predominantly agricultural characteristics. The traditional economy of the population of this parish was of the agricultural-forest-pastoral type, having been replaced by agriculture for domestic use. With the economic crisis that has been felt for years, the traditional economy has taken a new breath, being the base of survival for many families, some of whom returned to this territory, after having been part of the exodus to the big cities, having been verified the re/construction of several buildings [11].

According to the 2011 Censuses, the municipality where the territory under study belongs has shown a clear tendency towards depopulation and an increase in the population aging index: this index in the Pinhal Interior Sul (325%) is substantially higher than the national average (128%) and that of the county of Sertã (222%) is higher than that of the parish of Cernache do Bonjardim (186%). The depopulation compromises the future of this parish and its heritage, losing the know-how of generations. This is one of the reasons why drystone walls are progressively replaced by masonry or concrete walls, and some of those that still exist, eventually collapse due to lack of maintenance.

3.3. Drystone walls and the territory under study

In the territory under study, there were found walls for property partition and walls for land support, as already mentioned. In order to study and investigate, there was a need to characterize and group them into typologies. These typologies and the relationship of the walls with the territory, as characteristic elements of the same, are explained in this article. For the study of the walls, the following typologies, based on Rebelo et al. [8] were adopted: structural disposal of terraced fields; types of rigging; crowning; access to terraces; water capture, storage and transportation systems; use of water as a driving force; other built heritage. Fig.3 shows only one example of each of the typologies adopted, recommending the consultation of the work of Gonçalves [11] for more details.

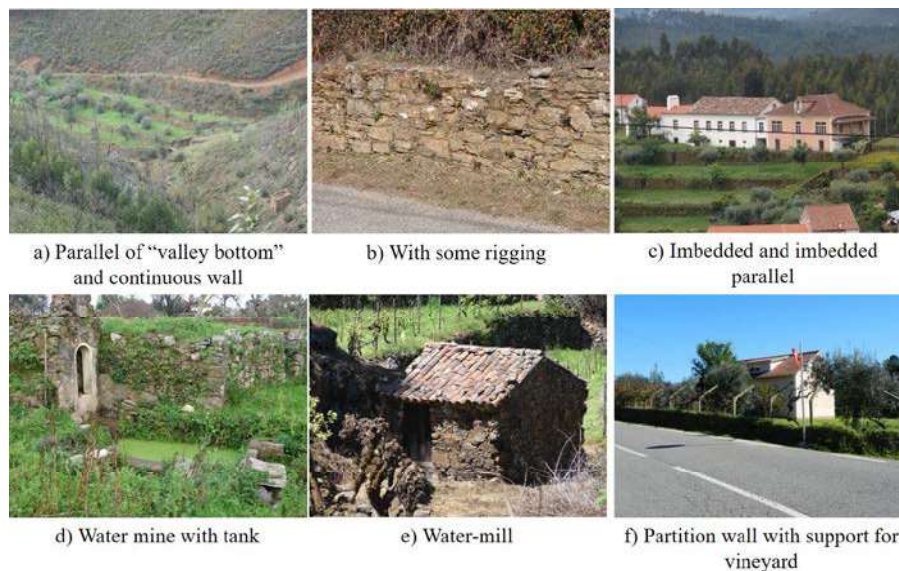


Figure 3: Some examples of the typologies found: a) structural disposal; b) rigging; c) access; d) water capture, storage and transportation systems; e) water as driving force; f) other built heritage (source: authors).

Structural disposal of terraced fields (Fig.3-a): Several typologies have been found, designated as “continuous wall”, “discontinuous wall” and “valley bottom parallel”. *Types of rigging* (Fig.3-b): The rigging found are mostly of the “with rigged or criss-crossed”, “with some rigging” and “polygonal” types. *Crowning of the walls* (Fig.3-b): The crowning of the walls is poorly elaborated, consisting only of an extension of the wall itself. *Access to the terraces* (Fig.3-c): The type of access to the terraces (or, as it is said in the local one, to the *botarés*), is usually made by stairs, of the type “imbedded” and “imbedded parallel”. *Water capture, storage and transport systems* (Fig.3-d): “Fountains”, “water mine”, “water mine with tank”, “tank” and “little dam” were found; some of these elements are currently plastered and heavily modified. *Water use as a driving force* (Fig. 3-e): Water-milling systems, called “mills” or water mills and “oil mills” were found, although most of them are in ruins. *Other built heritage* (Fig.3-f): “Houses”, simple buildings without interior divisions, buildings to overcome water lines such as “bridges” and “pontoons”, “partition walls of property” and “support for vineyard” were found. However, in this territory, partition walls can simultaneously have several functions, such as partition wall, support wall and vineyard support. As a general rule, the support elements for the

vineyard, which are called *latadas* (trellises), are currently made of concrete. As can be seen from the above, the heritage of dry stone walls is very vast in the territory under study.

If one of the reasons for the existence of terraces consists in the strong slopes, then one could expect that there would be more incidence of walls in the area with the highest mountain range in the West of this parish. Interestingly enough, it is the opposite that happens: the steepest area, due to the type of soil that occurs, is favorable to the forest, not requiring the construction of walls, while the rest of the area is more suitable for agriculture, requiring its construction (Fig. 4-a and b). Drystone walls, whether for partition of property or for support, constitute a structure of the territory, which characterizes it and allows, among other things, to identify the settlements, since the walls are located, mainly, next to them. As drystone walls have gradually been replaced by walls in masonry or concrete, the latter have been included in this analysis, since the construction of new drystone walls has not been verified. It can be seen, in Fig.4-c, how agriculture rules over the territory, being one of its identifying elements. It can also be verified that most of the walls are of masonry and not of drystone, confirming their progressive disappearance and/or substitution by other materials.

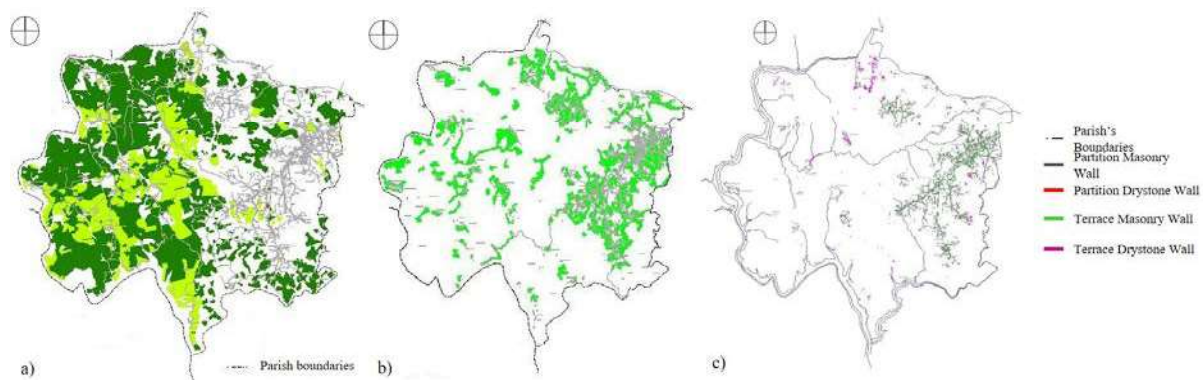


Figure 4: a) forest area; b) agricultural area; c) support and partition walls, in Cernache's parish (source: authors).

The majority of the soils in the territory under study, contain clay, which diminishes the water permeability of the substrate. Thus, a surface erosion on slopes by runoff water is increased. Terraces and walls slow down the flow velocity and consequently reduce the soil erosion and increment the water infiltration into the soil.

4. CONCLUSIONS

The first conclusion to be drawn is that, without stone, there are no walls and, although in Vilafranca del Cid, Spain, it is said "*tota pedra fa aplec*", which roughly means, in Catalan, that "all stone makes a wall", it is not always true because the stone has to be fit for this function. It is also concluded that without people, who knows how to select, to work the stone and to rig it, the walls wouldn't exist. Thus, in addition to all the material heritage that this art originates, there is also the immaterial heritage of know-how, which is being lost because these people are gradually disappearing without being able to pass this knowledge to future generations.

The spatial structure of the stone walls is one of the idiosyncratic factors of the territory, such as that of the parish of Cernache do Bonjardim, making possible, through the observation of this structure, to perfectly identify forest areas (due to their absence), agricultural areas and settlements (due to their higher incidence): agriculture rules over the territory.

Agriculture is the reason for this structure of walls' existence, since they are built and spatially distributed always with the function of allowing agriculture. Practically all life on the various continents depends on a layer of soil with a thickness of about 30 cm on average. It is understood, therefore, the

importance of retaining the soil and minimizing surface erosion. In the territory under study the soils contain clay, reason why the surface runoff causes erosion. This erosion is avoided by the existence of walls, which slow down the flow, allowing water infiltration into the soil.

The dissemination and explanation of the importance of this heritage is essential in Portugal, so that it is valued, demonstrating its potential as a form of territorial revitalization and making the populations protect and value it by increasing their sense of belonging, identity and pride.

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