

GIS for the enhancement of the farms in the territory of Oria (Puglia, Southern-Italy)

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Abstract – The GIS for the systematic filing of the farms in the territory of Oria (province of Brindisi) has been organized in such a way that the common characteristics of the buildings can be detected immediately: in this perspective, appropriate tables have been drawn up, converted into special formats, to be dynamically connected to the artefacts and vector themes being analyzed. These tables, beyond the peculiar typological, structural, constructive and architectural characteristics, offer fundamental technical data and results so that an orderly and efficient recovery plan for the farms present in the territory of Oria can be first conceived and then planned.

I. INTRODUCTION

The introduction of the GIS (Geographical Information System) in the field of science and technology for the conservation of Cultural Heritage is a relatively recent acquisition, despite this there has been a rapid development of applications in this sector. The reason is substantially linked to the multidisciplinary character of this research area which makes it essential to use a tool capable of correlating and integrating the most varied information and the results deriving from the various cognitive analyzes: from historical research to archaeological surveys and prospecting, from chemical and physical analyzes aimed at the knowledge of the state of decay to the historical-artistic and architectural study. From the survey on the farms of particular historical, landscape and typological value that can be used for the purpose of recovery and enhancement, the existence of an important building heritage emerged: restoring functionality to the ancient agricultural settlements, primarily the farms, means saving them. many from a

definitive deterioration and recover a not indifferent part of our culture and our history.

II. THE FARM IN ORIA

There is no farm in Puglia that does not bear on its walls the story of an ancient relationship, of love and respect between man and the surrounding nature. They were, in fact, built in a certain way, because they had to be functional first to the feudal lord, then to the farmer, but at the same time they could also be a place of production, work, and storage. The name derives from "massae", a set of rural buildings with large estates, real autarchic citadels, with defensive possibilities, where we still see sighting towers and mighty walls. They are isolated as small autonomous villages and have different origins and functions, such as those of breeding, agriculture or, as for the royal farms of the 15th century, the function of controlling transhumance. Structurally and economically speaking, heir to the Roman villa of the lower empire, with a closed-circle society and production, over time it will become an intelligent use of the territory, which will eventually determine housing, economic and also cultural forms of the nearby city (Fig. 1). In many of them you can find frescoes and chapels, and not infrequently there are churches with inside the characteristic frescoes of the time. Many, located a few kilometres from the coast, with a tower structure, served as a fortification constituting a second defensive chain. Historians have wanted to see, in fact, in the Roman "villae rusticae" the premises of these complex peasant factories; on the other hand, it is possible to read the signs of this centuries-old

history also in the constructive stratification, which allows us to hypothesize a very long period of life for many complexes. In the planimetric development it is also possible to grasp the passage, induced by the need for security typical of the medieval period, from the Roman "villae rusticae" to the Castrense dwelling, that is fortified or at least fenced, as was used by the Lombards. It was precisely the latter who proceeded, here and there, to a division into mansi and to the affirmation of the small landed property, which declined only around the ninth century, replaced by large landed property. The reasons why the farms had a great development in the Middle Ages are better known and intuitive; in fact, in this period, a political-military crisis hit the entire West and this caused an intense phenomenon of ruralization of social and economic life. In southern Italy, the farms became centers of aggregation, defense and secure survival. These "centers" were all the more vital the more the cities became depopulated and gradually took the form of real agricultural factories, with a highly articulated work organization and with the presence of highly specialized operators. As for the location of these settlements, it must be said that the farms were built and developed along the roads already existing in the Middle Ages; these were largely Roman if not even older. In the most important farms there is no shortage of chapels which probably represented a necessary accessory of the most important villages. As for the work environments, which were the most conspicuous part of the entire settlement, it is useful to draw a concise profile. The stables were generally

located under the houses. The deposits were placed in the most inaccessible and internal places, not only for safety reasons, but also to have cool and dry rooms (therefore far from the cisterns). The shelters for herds were generally arranged along the perimeter walls and were covered with trusses with sometimes very low tiles. The cisterns played a very important role in the farms as they were an essential resource and the water was used very sparingly. In them the rainwater from the upper terraces was collected with a canalization system. The cisterns were generally dug into the tuff or built in ashlar and then plastered with the lower floor in watertight earthenware. Being reserved exclusively for domestic needs, they were almost always allocated under the residential nucleus, so that they could comfortably and directly draw water. The aquariums, also very important, on whose reserves the good annual results of both the cultivation and the breeding of sheep generally depended, were maintained with care and were generally placed in the natural hollows of the land towards which the waters could be channeled more easily. rain. They were almost always of considerable size. The ovens were always close to the residential areas and had sufficient capacity for the weekly needs of the inhabitants of the farm (Fig. 2,3).



Fig. 1 – The Terra d'Otranto in a view of 1649.



Fig. 2 – Masseria Palombara in the countryside of Oria.



Fig. 3 – Masseria San Domenico in the countryside of Oria.

III. THE GIS STRUCTURE

In the analysis conducted using GIS, a mere geometric representation of the artifacts or objects is not achieved: what stands out are rather the direct spatial relationships between the different elements, such as connection, adjacency or inclusion. From the aforementioned reports, the GIS system will allow - through the structuring of different but complete data - to define complex space monitoring analyzes, outlining the specific features of the topos from time to time. In practice, the data model, in a perspective of effective interaction, must provide for the insertion, within it, of descriptive data of the individual real objects, which can be defined as attributes of the space. These three sets of information (geometry, topology, attributes) are then effectively implemented in a GIS by means of a specific physical model, which today is based on relational data structures, typical of the most

advanced databases and on hardware and software architectures of the type client / server, typically in local computer networks. More generally, the essential steps to produce a geographical data processing are:

1. data input;
2. data management;
3. data analysis;
4. presentation of data.

However, it will be necessary to distinguish the type of data. They are usually divided into two categories:

1. spatial data (ie the positioning of the geographical elements: in our case the farms in the territory of Oria);
2. attribute data (i.e. the whole of the monument, location of the same, name, century of construction, state of conservation, etc.), associated with spatial data.

The spatial data (maps, surveys, etc.) have been implemented by manual digitization, scanning and graphic files in vector format; the attribute data, on the other hand, were introduced via computer keyboard scripts. In general, all the information entered in the GIS comes from paper supports, attribute tables or databases inside the software. We remind you, in fact, that the attribute data are valid as results of the historical-urbanistic research, of the historical-artistic studies and of other analyzes carried out at the same ISPC-CNR. The implemented spatial data consist of suitably georeferenced vector-type cartography. Briefly, it is reported that the identification of the monuments, on the relative basic cartography, was performed according to the specific typology: the option of a typology to refer to the geotype, that is to the class of graphic object, depends not only on its extension in the space, but also by the intended or foreseeable use to be made of each element in the data management phases. After the process described, attribute-tables were appropriately drawn up interactively linked to the farms, so as to determine, upon request for data by pointing, a class of detailed information on the site of interest. The attribute data have been entered in an internal database (Fig. 4): each table is linked to the geotype through the link ID, which is automatically managed by the GIS software. The complex management of data, that is the procedures for archiving and searching for the information introduced in a GIS, are then entrusted to a database that manages the information relations. The path to identify the information is divided into "search keys" defined with a unique target and a differentiated demand hierarchy: for example, it will be possible to search for the individual artistic-architectural emergencies of the farms or the structural and morphological characteristics of the same (Fig. 5). The management of the various cartographic themes associated with a cultural asset has been entrusted to the overlay technique, that is, the coding of basic information for different layers (Fig. 6).

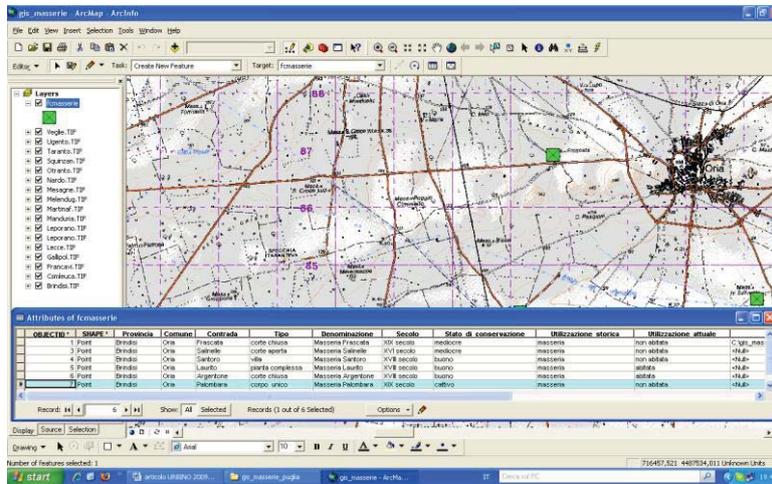


Fig. 4 – Screenshot during a work session: the database associated with spatial data (farms) is highlighted.

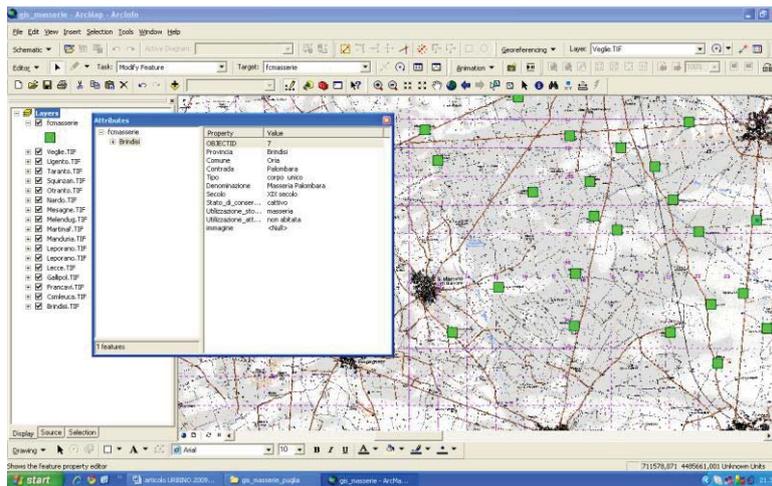


Fig. 5 – Screenshot during a work session: the database associated with spatial data (farms) is highlighted.

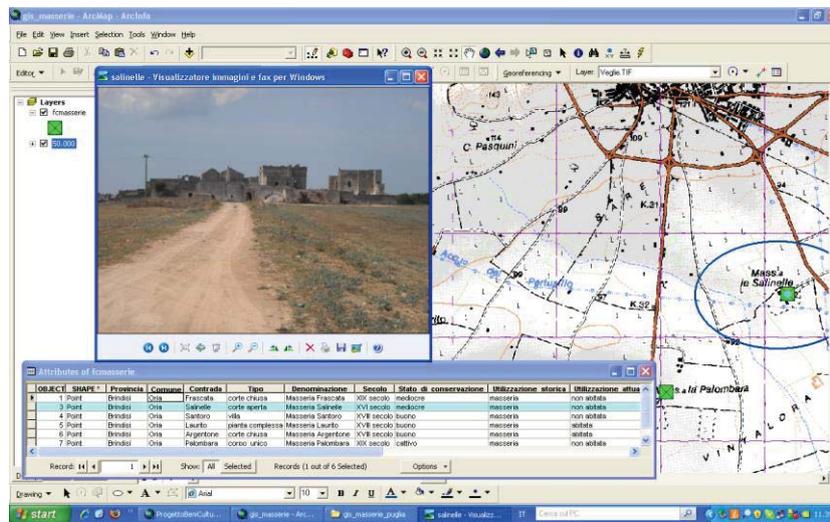


Fig. 6 – Screenshot during a work session: the photo associated with the spatial data (farms) is highlighted.

IV. CONCLUSIONS

From the survey on the farms of particular historical, landscape and typological value that can be used for the purpose of recovery and enhancement, the existence of an important building heritage emerged: restoring functionality to the ancient agricultural settlements, primarily the farms, means saving them. Many from a definitive deterioration and recover a not indifferent part of our culture and our history. Thus, we want to make the farm product usable to the fullest by identifying a series of itineraries that highlight the area and its natural, landscape and historical resources.

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