

Regeneration of abandoned rural landscapes: the case of underground settlements in Molise

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Summary

Hypogean settlements are characterised by a very strong relationship between man and the surrounding environment. In many Italian areas this relationship is clearly visible and has created landscapes scattered with cavities. The presence of these settlements in some Molise villages left a mark on the history and culture of the place, as well as on the landscape. This research aims to understand and catalogue this heritage which is evidence of the peasant culture which has characterised the region. The research also aims to create a Geographical Information System. The hypogean landscape GIS will support the management, protection and ideas for re-use of the structures in order to set up the sustainable development of the rural territory.

Introduction

The rural landscape of Molise is distinguished by a typical rural architecture. Little research has been undertaken regarding the underground structures, mainly linked to agricultural use, present in some areas of Molise. This underground heritage, which extends throughout the Mediterranean basin, is characterised by a very strong relationship between people and the landscape. This relationship, sometimes very complex, led to the development of strategies for survival and adaptation to the environment. These strategies, in turn, led man to modify the environment and territory and so as to benefit from the physical and environmental characteristics of the area.

This intense relationship has also led man to exploit the subsoil, a great resource for the inhabitants.

Many Italian centres, which grew up during the Middle Ages, have not yet been carefully studied by researchers as regards signs of a hidden civilisation that is not very visible, constituted by poor people.

The term “cave” has often been associated with a type of primitive troglodyte civilization and, probably, *“for us, accustomed as we are to regarding the city as the natural place in which social life forms, it is not easy to think that in ravines, swamps, gullies, that is those more or less deep rifts which characterise the landscape in a large part of the Mediterranean area, and therefore of southern Italy, could have produced living conditions such as to form actual rock-cut villages”*¹.

These hypogean structures have been ignored for many years, perhaps because they were not considered a subject worthy study but today they are considered very important elements of rural architecture, even though of rudimentary form.

It is certain that, if these underground structures were ever used, they were made and used over the years by poor people who could not afford to buy construction material to build a house or shed for agricultural tools. This settlement type has always been considered unhealthy and a symbol of degradation, but many hypogean settlements, especially during the Middle Ages, expanded as a model in contrast to the city and its rigid rules. Poorer people could certainly find refuge here in the medieval period when the population moved into the towns with the consequent depopulation of the countryside. But not all country dwellers arriving in town, found work and somewhere to live. It is also true, on the other hand, that not all caves were created in the medieval period. Probably many of these caves were created before this period, others ones were created by enlarging natural caves.

Another important factor, giving, in the Mediterranean area, an incentive to this phenomenon, was the spread of Benedictine Monasticism: several hypogean structures arose as the first structures of a Benedictine monastery. These monasteries, like the cities, attracted the country dwellers to come in from surrounding areas and they became the centre of new settlements. In many areas, as there was still no money for building, excavations were undertaken instead. Slowly the centre grew and the monks realised that the monasteries were the focus of life in the surrounding countryside and

¹ **Fonseca Cosimo Damiano**, *Il popolamento rupestre dell'area Mediterranea: la tipologia delle fonti. Gli insediamenti rupestri della Sardegna*, Galatina, Congedo Editore, 1988, p. IX.

they became a very powerful reality. The Molise region is an example of these fringe realities, where there are many traces of hypogean settlements, as yet unstudied by researchers. The biggest problem is that by continuing to leave these important traces of the landscape and history of local populations unexplored and at the limits of scientific research there is the risk of losing the considerable hypogeal heritage in the region. This research topic grows out of a passion for the marks that man, over the time, has left on the territory, especially as a result of interaction with the surrounding environment. As man built, leaving marks on the territory, he also made underground structures which left an indelible mark on the landscape, especially on the rural landscape. Since Molise is essentially a rural region the question which started the discussion and research was that regarding the possibility of identifying these signs of human activity within the region. The awareness, that the whole of Italy is crossed by an intense network of underground structures, led to the question as to whether the territory of Molise is part of this network. One of the starting points for this line of thought comes from the words of Gianluca Padoan, one of leading experts on the underground world: *“Italy is a casket of historical, architectural, archaeological evidence and there is an underground world made of negative architecture, the result of economic and social activities, of daily life and culture, that generations of quarry workers and builders have left in their passing. As man built on the surface, over time he has perforated the subsoil creating ‘spaces’ and leaving substantially intact architecture, legible and therefore studiable, recoverable and sometimes exploitable too. The types of our hypogeal structures, and the variety of shapes created, are among the most varied to be found in Europe”*².

Subsequently, a comparison with other neighbouring regions led to the acceptance of an apparently difficult challenge, that is the study of hypogean landscapes in Molise. The importance of defining the hypogean reality in Molise arises from the belief that the territory greatly influences the settlement choices of different cultures and peoples. Man, over the centuries, has exploited an area’s resources or has adapted the territory to his needs. Man has always had to live with nature. Therefore, the landscape has evolved over time in tandem with the human changes and the creation of settlements and infrastructures.

The use of subsoil for civil and residential use by the man was, first, a consequence of the type of environment in which he was living, and on the other hand, was the cause of

² **Federazione Nazionale Cavità Artificiali**, Padoan Gianluca (edited by), *Metodologia d’indagine*, www.fnca.teses.net

several changes to the original environmental, although that change is not visible at a first glance. Human history is closely linked to hypogean structures and the exploitation of the subsoil. Man, in fact, has always had a privileged relationship with the underground, since the dawn of civilization. Several causes led man to take shelter in the womb of the earth, such as the need for a protected shelter, cult use, the need to bury the deceased, the exploitation of subsoil resources, the need for suitable environments for food conservation, the need for suitable environments for water conservation and water supply. The geology is a determining factor in the development of these settlements: the areas, affected by the presence of this type of settlement, are characterized by rocks that are soft and compact and easy to excavate. Man soon realized that excavating a city was cheaper than building one, especially where raw materials like wood were scarce. This type of settlement was camouflaged by nature and insured greater protection from enemies and from atmospheric conditions. In this way man did not occupy valuable land for agriculture. This hypogean heritage extends throughout the Mediterranean area from Algeria, to Morocco and Tunisia, from Cappadocia to Macedonia, from the Iberian peninsula to Southern Italy. Most populations, from the Etruscans, to the Romans and early Christians, who inhabited the lands of the Mediterranean basin soon learned to exploit such an important resource as the subsoil.

In many Italian areas, the relationship between man and subsoil is very clear and it created landscapes studded with voids and cavities such as the famous site of Matera. A lot of less important areas are nowadays affected by the presence of much evidence of the intense relationship between man and earth. The presence of these settlements in some Molise villages has marked not only the place's history and culture but also the agricultural landscape; in this landscape, these signs are still legible and it is necessary to analyze them.

Hidden and too often forgotten landscapes need careful attention. At a first glance, these landscapes appear to be of little interest, they are not exceptional landscapes and sometimes no longer even part of daily life as they have been abandoned for a long time. These hypogean landscapes can be classified as *degraded landscapes*³; they are not only the periphery of urban landscape but also landscapes related to rural and

³ The **European Landscape Convention** (ratified in Italy by the law No. 14 dated 2 January 2006 published in the GU No. 16 dated 20 January 2006, Suppl. Ord. No. 16), in the article No. 2, "*concerns landscapes that might be considered outstanding as well as everyday or degraded landscapes*", apart from their aesthetic value.

agricultural use that no longer occurs. Perhaps, they have a very little economic value and sometimes they are not worth recovering, but they represent important evidence of a culture and country that has characterized the South of Italy. The awareness that this type of settlement is strongly linked to the culture of poor farmers and shepherds has stimulated this work in a rural area such as the Molise region.

The Molise region and its rural characteristics

The Molise is characterized by well defined features, even if it is a small region which occupies approximately 4,500 km sq and is mostly mountainous and hilly with a coastline that extends for only 36 km.

The region slopes gently from the Matese mountains and the Mainarde mountains down to the sea to the east. The river courses follow this path from the mountains to the sea, creating parallel valleys that are the main communication routes through the region. Other marks written on the territory of the Molise, are the drove roads and their smaller branches. For centuries social and territorial networks were organised around the drove roads and transhumance in Molise. All peoples, who inhabited the Molise territory, were part of this transhumant civilization: from the Samnite settlements to the Roman city, from medieval castles to the villages of Croatian and Albanian origin, all settlements developed along these major socio-economic routes. Transhumance is another phenomenon, such as the development of hypogean settlements, that is typical of the Mediterranean basin, particularly in Southern Italy and Spain, but also in the Balkans, the Carpathians and France. In Southern Italy, the regions involved in this phenomenon were Abruzzo, Molise, Puglia, and also Basilicata and Calabria. Molise is between the regions that were the starting point and destination of the transhumance routes (Abruzzo and Puglia), it was a through-route: hence the name “*land of transit*”⁴. This title, created by the phenomenon of transhumance, gives the idea of a territory that was little known and explored because it was only a through route and not a territory of particular interest. Ignored by most travellers, also because of difficult accessibility, the region always had problems of cultural identity because it was not recognized as a Region until 1961 when it was finally separated from Abruzzo. The difficult and varied topography and geomorphological conditions in the region have meant that the Molise, unlike other regions of central Italy, is a region characterized by low population density

⁴ Cialdea D. (edited by) (2007), *Il Molise terra di transito. I tratturi come modello di sviluppo del territorio*, Ripalimosani (CB), Arti Grafiche La Regione.

and that only a small percentage of the area is urbanized. The distribution of urban centres has always been influenced by the difficult conformation of the region so that today, of 136 municipalities in Molise, 123 are mountain villages. This distribution has also been influenced also by the passage of the smaller branches of the drove roads.

The low population density that characterizes the region (around 72 inhabitants / sq km), together with the difficult geological features, have spared strong forms of urbanization which have developed in surrounding regions. Only the Molise's coast is more heavily urbanized than the rest, but still retains very marked rural characteristics. The region is therefore characterized by an economy predominantly related to agricultural activity, in which the population has been involved since the pre-Roman period. The towns are located mainly on hilltops, overlooking the river valleys below, and the surrounding countryside is dominated by a series of scattered rural settlements. Therefore, they are built on rocky spurs - for most of the region this is clay-limestones (commonly named tufa).

Very soon man learned that it was possible to excavate this material, which is easily eroded, using basic techniques in order to build shelters and refuges.

The interaction between man and the natural environment over time, even in Molise, gave rise to hypogeal structures that survive today, providing evidence of the heritage and identity of the people who inhabited this land. Through careful reading of this architecture, it is possible to read and interpret the history of the territory and population, from primitive man to the Pentrian peoples, from the Romans to the present day. Many regional caves are linked to the passage of one of the major drove roads or the smaller branches. Among these caves, there are not only temporary shelters, but also caves linked to peasant religion. So not only the drove roads, but also hypogean structures in some villages of the region, have left a mark on history, culture and landscape. Other underground structures, however, were made for agriculture use and were used as a farm sheds. The use of others, initially used as shelters by primitive man, evolved depending on socio-economic change.

Aims and methodology

This research aims to gain an understanding of the hypogean phenomenon, to gather traces of history that have been impressed in the walls, to search for evidence of the rock-cut civilization that characterized urban and rural areas around the Mediterranean basin. After defining the field of investigation, the next objective is to list the hypogean

structures, a historical heritage of peasant culture that characterized the region and eventually at least to create a Geographical Information System for the underground landscape. The investigation methodology is divided into the following phases:

- Preliminary investigation;
- Field work;
- Definition of homogeneous territorial areas;
- Analysis;
- Census and list of hypogean structures;
- Database application;
- Data processing;

Preliminary investigation was conducted through the analysis of historical, archival and bibliographic sources. The main difficulty in this phase was the almost complete lack of literature on this subject but research was undertaken on specific texts regarding the villages that could be of interest for the presence of hypogean structures. This stage gathered information regarding the presence of hypogean structures in these places. The next stage was, therefore, to verify *in situ* the information obtained from the previous stage and to collect data on the presence of hypogean structures. Most of these structures found during these two stages are located in the province of Campobasso. Within this territory there are three areas (Figure 1):

1. Upper Molise with the villages of Gambatesa, Macchia Valfortore, Jelsi, Tufara and Pietracatella;
2. Lower Molise, with the villages of Montenero di Bisaccia, Guglionesi and Palata;
3. Central Molise with the villages Pietracupa, Trivento and Salcito in the Valle del Trigno.

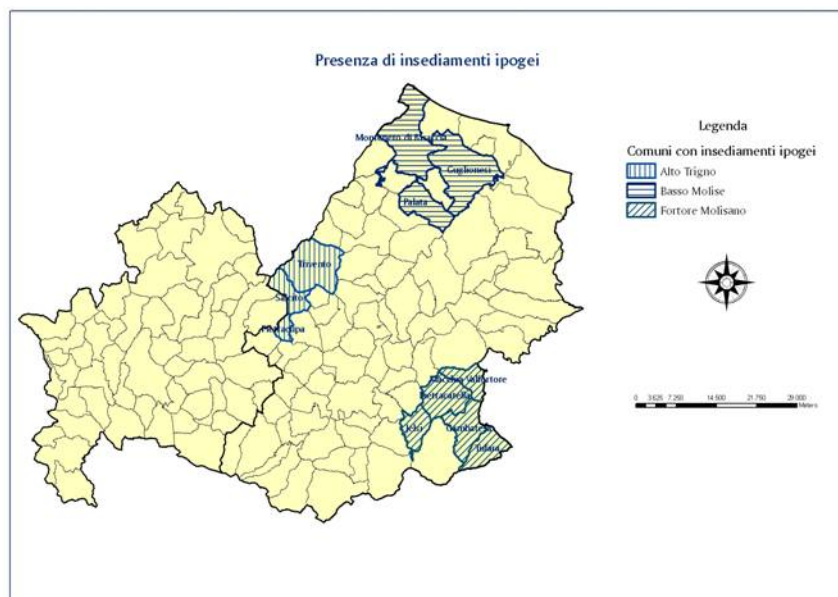


Figure 1 The villages in this study.

These three areas are characterized by different geological, historical, cultural and socio-economic characteristics.

It was thought necessary to identify case studies for the implementation of the work so as to consider the different territorial realities of the Molise region affected by this phenomenon. Three municipalities were identified as optimal choices for the implementation of such research for several reasons that will be explained later.

For each case study, an analysis was conducted divided into the following fields (described in detail below):

1. Spatial analysis;
2. Historical analysis;
3. Socio-demographic analysis;
4. Analysis of the territorial resources;
5. Analysis of urban planning and territorial norms.

The next stage was the making of a census and catalogue of all underground structures within the territories of the case studies using a previously prepared datasheet catalogue. The final stage of the research foresees the construction of a geodatabase of the hypogean structures that were previously catalogued and georeferenced using a Geographical Information Systems. The Geographical Information System will also aid the compilation of a recovery plan from the point of view of sustainable development in rural Molise.

The fundamental criterion for the choice of the case studies is based on their representativeness within the territory of Campobasso Province in order to select the villages including those identified in Figure 1, which can clearly represent all of the characteristics of the regional territory and can test a methodology of study that could later be expanded to other territories. Using this criterion, the choice fell on the villages of Montenero di Bisaccia, Gambatesa and Pietracupa that are representative in the following respects:

- Territorial survey: the three municipalities show the coastal, mountainous and hilly areas typical of Molise; there territories are of large, medium and small extension and thus represent all types of municipality within the Molise;
- Geological survey: the three municipalities take into account the three most common geological types within the Molise. Montenero di Bisaccia is characterized by the predominantly clay soil with some multicolour clay with the presence of geological phenomena such as badlands, Gambatesa is characterized by an alternation of whitish clay, sand, yellow sandstone and limestone conglomerates; Pietracupa is characterised by Flysch clay from which large limestone agglomerates often project;
- Demographic survey: the three towns have a resident population that is respectively, high, medium and low;
- Economic survey: Montenero, representing the coastal and pre-coastal towns, it is a very lively town and leads in terms of the economy and industrial production; Gambatesa is in typical hilly country with a medium population primarily devoted to agriculture; Pietracupa represents a typical mountain town, difficult to reach, with a small and poor population;
- Planning survey⁵: Montenero is one of the few municipalities (9) of Campobasso Province to be equipped with a P.R.G. Gambatesa and Pietracupa represent the

⁵The planning situation in Italy is designed by three principal tools at different levels. At municipality level there is the **P.R.G.** (Piano Regolatore Generale) and later the **P.d.F.** (Programma di Fabbricazione). The P.R.G. is the General Urban Plan, a tool to plan the urban growth of the Italian cities and was introduced in Italy by the Urban Law No. 1150 of 1942. The P.d.F. is the Building's Plan, a simplified Urban Plan for the smaller Italian towns and villages. At Province level there is the **P.T.C.P.** (Piano Territoriale di Coordinamento Provinciale). This tool is the General Plan of the Provincial Territory. At regional level there is the **P.T.P.A.A.V.** (Piano Territoriale Paesistico Ambientale di Area Vasta). This is the Vast Area Landscape Environmental Plan, a planning tool introduced in Italy by the Galasso Law (No. 431/1985). This plan in Molise is the only planning tool above the municipal level because the General Plan of Provincial Territory is still being compiled. In this research we have considered the studies for the implementation of the P.T.C.P. of Campobasso Province. These studies consist of preliminary analysis maps of the provincial territory.

remaining 75 municipalities of the province that are equipped with P.d.F. Montenero also is included in the area of one of the 8 P.T.P.A.A.V. of the Molise region, whilst Pietracupa and Gambatesa are not included in the areas of this plan like most of the Central municipalities. The P.T.C.P. for Campobasso Province included all the three municipalities.

Following the identification of case studies an analysis was prepared for each of territories in the manner described above.

The territorial survey looked at the overall territorial and geographic situation: the case studies involved the territory of Lower Molise and Upper Molise which respectively represent the coastal area, the mountainous area and the hilly area of the region.

The socio-demographic survey was conducted using data of the P.T.C.P. and the census data of the ISTAT⁶. The three cases are included in the area of Campobasso Province, a territory that, for the most part, is classified as mountainous. Almost all the villages are of medieval origin and stand on a ridge, and have, over the last two centuries (XIX and XX), seen the growth of construction and the development of urban settlements around the original nucleus, which, almost always led to the depopulation of the original centre. The territory of Campobasso Province is characterised by a large number of small or very small towns, badly connected and suffering progressive depopulation and the consequent ageing of the population. This phenomenon inevitably leads to lack of employment and, therefore, a no income generation. Many centres are linked to activities of traditional agriculture and sheep farming. The emptying of the smaller towns, in favour of the few larger urbanized centres, leads inevitably to the degradation of the housing system and the risk of ruin, through negligence, of an essential part of the historical, cultural and architectural heritage.

For the demographic survey, parameters such as demographic trends (population trends over the years), the employment rate (the number of resident persons employed of total residents in the municipality) and index of old age (the ratio between the resident population aged greater than or equal to 65 years and with less than 14 years) were analysed. The economy of most towns in Campobasso Province is essentially agricultural based and the tourism sector has been rather neglected.

For the industrial sector it is known that the largest concentration of population employed is in towns such as Termoli, Campobasso and Montenero di Bisaccia. As for

⁶ **ISTAT** (Istituto Nazionale di Statistica) is the Italian National Institute of Statistics and is a corporate body of Italian public research.

the tertiary sector mainly employs people in the towns of Campobasso, Termoli and Bojano, followed by Campomarino, Montenero di Bisaccia, Larino and Riccia.

The agricultural sector in the province is important, indeed it occupies approximately 12.13% of total people employed. ISTAT data shows that Campobasso Province manifests a high level of agricultural activities⁷, for a total of 205,082.77 hectares of agricultural area (grain, wheat, vegetables, grass, vines, olives, fruits); this represents 70.50% of the province's surface area. What tourism is able to offer is insufficient for the ambitions for the development of this sector. Under present conditions tourism cannot be attributed a leading role in the development of the local economy. The majority of hotels (66) are three star (41.2% of those present in the territory) and are concentrated on the coastline. The remainder are located in the hinterland of the Matese area, with some exceptional presences in the remaining part of the province. Another important feature is the availability of structures for farm holidays (32), these structures are uniformly distributed throughout Campobasso Province.

The resource analysis was conducted through field work, not only in order to sample the hypogean structures but also to place the focus on a landscape characterized by numerous historical, environmental and cultural factors. The study and correlation of different factors such as the presence of SIC (Sites of Community Importance), the presence of distinctive characteristics of rural land like the drove roads and the rural housing linked to them, the presence of historical sites of importance for the memory of the population, have enriched this research. Thus the landscape came to be considered as a single entity and not the sum of many characteristics that sometimes cannot even be very clearly distinguished.

The analysis of planning tools began by studying the urban planning instruments in force in each municipality and then by the regional and provincial plans. This analysis shows whether or not the legislator has considered the presence of hypogean structures in planning and urban design. The first step was to procure the existing urban planning tools.

Next the existing planning instruments of a higher level in the province of Campobasso and the Molise region were studied.

⁷ The farms in Molise are numbered 25609 by the V Agriculture Census data (ISTAT 2000).

As shown in Table 1 all the case studies were included within the areas of competence of the General Plan of the Provincial Territory of Campobasso. Only the municipality of Montenero di Bisaccia is included within the competence area of one of the eight Vast Area Landscape Environmental Plans in force in the regional territory.

Municipalities territory	Urban Plan	P.T.C.P.	P.T.P.A.A.V.
Montenero di Bisaccia	P.R.G.	yes	No. 1
Gambatesa	P.d.F.	yes	no
Pietracupa	P.d.F.	yes	no

Table 1: The planning tools of the Municipality case studies.

The datasheet catalogue

The phase of the census and list of existing hypogean structures in the municipalities covered by this study was supported by a previously prepared datasheet catalogue, which allowed the collection of similar information for the various caves which could be compared and entered into a geo-database. The datasheet catalogue was prepared taking into account the most significant data for this type of study. The datasheet is composed of different parts but can be grouped into three different types of data:

1. *Identification and location data*, this first part shows the geographical information about the cave such as its location. The province, the municipality and the geographic location of the cave with the geographic reference coordinates are noted in this box. Another important parameter for understanding the hypogeum phenomenon is the orientation of the cave; this is a useful element for understanding the structure's function in the past;
2. *Typological and technical data*: in this second part the classification of artificial cavities produced by the National Commission for Artificial Cavities⁸ is given. Based on the evidence, on literature and morphology the typology of the cavity was obtained.

Another important piece of information is the function of the cavity: the original function, which in some cases can still be deduced, and the current function and the information on the ownership structure. The box regarding the technical characteristics

⁸ **Società Speleologica Italiana**, Commissione Nazionale delle Cavità Artificiali, Suddivisione Tipologica, 1999, http://www.ssi.speleo.it/it/index_ita.htm

aims to highlight the type of material excavated and used for the construction of support structures; the characteristics of entrance to the cavity (in some cases closed by gates, in others completely walled up); the existence or absence of other openings, decorated and/or architectural elements added. Finally an attempt was made to define the possibility of carrying out a study of the internal structure in order to define the state of conservation. The value for the state of conservation is given by the combination of several factors, including accessibility to the external area of caves and the accessibility into the interior. Only if it is possible to undertake a survey of the interior, can the state of conservation be defined on the basis of the evaluation of parameters such as the presence of additional and removable structures inside or outside the cave, the presence within the structure of wall support, wall partitions or walls that shut off the back of the cavity. Where access to the cavity is not possible then it is only possible to define a probable state of conservation, defined by the evaluation of parameters such as the insertion of additional structures or external structures that are not compatible with the surrounding environment;

3. *Issue of datasheet data*, the sources and bibliographic tools and the existing urban plans.

A case study: the hypogean settlement in Montenero di Bisaccia

This section describes a case study: the hypogean settlement in Montenero di Bisaccia. Montenero di Bisaccia stands on the lower right side of the Trigno river, in the area of the Tecchio torrent. The town is situated on a sandy hill at the bottom of the Frentani Mountains. A typical hilltop town overlooking the Adriatic sea, the territory of Montenero di Bisaccia ranges between 273 m a.s.l. in the town centre down to sea level. Its territory spreads over 93.01 km sq and marks the border between Molise and Abruzzo.

The climate is characterized by quite mild winters, with low and sporadic snowfall, and by hot and dry summers.

The old town's urban layout, of very ancient origin, was influenced by the presence of Centurelle-Montesecco drove road that passed through the town. This town is characterized, due to the lithological substrata, by numerous tufa caves in the western part of the hill and by a landscape marked by badlands.

Montenero di Bisaccia has ancient origins: the name derived from the combination of two nearby villages: Montenero and Bisaccia.

The town originally developed from the village of Bisaccia, which has retained its name and whose ruins are still visible about a kilometre outside the new town. This village was abandoned because the territory was invaded by barbarians. At that moment the inhabitants took refuge first in the sandstone caves located in the hill's west side and then they began to settle on the hilltop, known as "black mountain" for the thick forest that covered it.

Traces of human settlements, dating to the Neolithic Age, have been found in some of the sandstone caves that are along the hill ridge and prove that the territory of Montenero has been inhabited for a very long time. Documentary evidence for existence of this village dates back to 872 A.D. when Riccardo Borrello, known as "Riccardo of Montenero" an adviser to Emperor Frederick II, was the first feudal lord. The village, perhaps for its strategic position, was subject to raids by the Saracens (842-851) and Turks (1712).

The area of Montenero di Bisaccia is part of the Lower Molise. This part of the region is characterised by the presence of three major river valleys created by the Trigno, Biferno and Fortore rivers that, with their tributaries, create a dense network of valleys that have created the characteristic ridges of the area over the centuries. The summits of these hills have been used for building urban centres while the valley bottoms have been used to build scattered rural houses and structures using water such as water mills and power stations. This area is characterized by the presence of predominantly clay soils with a sandy-gravel cover. The clays in this part of the territory are Pliocene clays, Montesecco clays and multicolour clays. The principal covers are Serracapriola sands⁹ and Campomarino conglomerates.

The Montesecco clays lie above a mix of clays and sands which give rise to yellowish or reddish sands with different levels of hardening, the Serracapriola sands. This geological formation is a clear dominance of yellow quartz sand interspersed with well-cemented sandstone and clay of white or light green colour. By contrast, the Campomarino conglomerates, overlie the Serracapriola sands and are more extensive in the territories of Termoli and Campomarino at the mouth of the river Biferno. But they are also found in inland areas such as Guglionesi where, however, they are often covered with sediments of lacustral origin. The geological formation of scaly clays (or multicolour) is found along the outer face of the Apennines and mainly characterizes the

⁹ **Lanzafame Gianni, Tortorici Luigi**, *Osservazioni geologiche sul Medio e basso bacino del Biferno: Molise, Italia Meridionale*, Roma, 1976.

area of Montenero di Bisaccia. This formation is intensely mixed and consists of a tectonic melange of blocks of different origin and size. On the left side of the Biferno river there are also characteristic phenomena such as badlands. The territory of Montenero di Bisaccia is characterised by the presence of such badlands. The area of the Montenero badlands is one of the SIC (Nature 2000) in the municipality (IT7222213). This site has an area of 121 ha and an average altitude of 195 m above sea level and consists of compact marls and marly, sometimes leaved, clays. The ecological value of this area lies in its geomorphological configuration that provides a suitable environment for particular flora and vegetal species. The environmental quality of the site is remarkable for the degree of overall conservation and its naturalistic value, but badland areas, by their nature, are subject to erosion and landslides. The area of Montenero is affected by the presence of other sites within the SIC municipality (Figure 2).

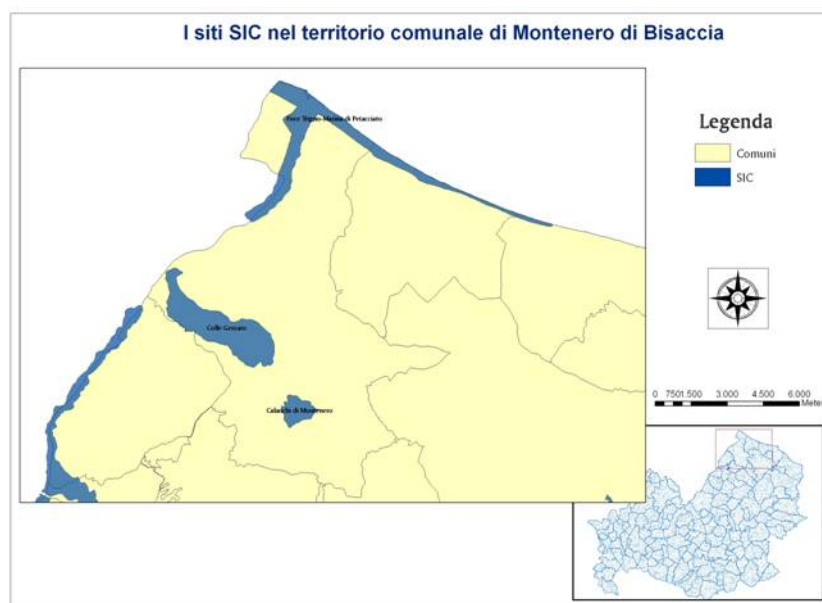


Figure 2 Spatial analysis: the SIC map in the municipality of Montenero di Bisaccia.

As regards demographic analysis, it is known from the town's population census data from 1871 to 1951, that its population almost doubled from 4103 to 8151 units, an increase of 98.6%. Subsequently, however, as a consequence of the war migration began. This phenomenon led many Italians to emigrate abroad in search of work. From 1951 to 2001 the population of the municipality decreased from 8151 to 6698 units, a decrease of 17.8% (Figure 3).

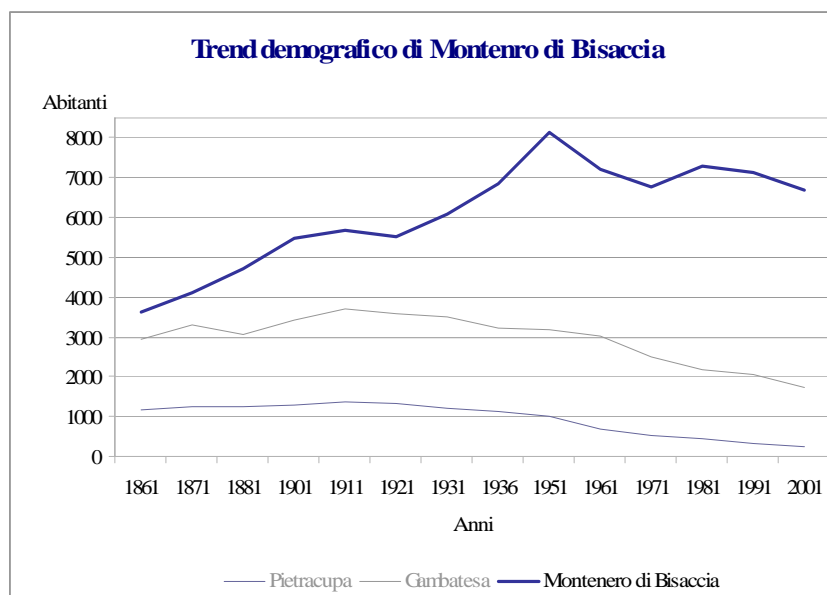


Figure 3 Demographic trends in the municipality of Montenero di Bisaccia from 1861 to 2001 (Source: ISTAT, Population Censuses).

The socio-economic analysis, based on data collected from P.T.C.P. of Campobasso shows how the town of Montenero di Bisaccia is one of the more active municipalities in the province in terms of agricultural production and trade. The favourable geographical position, it is in fact a coastal town equipped with many infrastructure, makes the area of Montenero one of the most productive in the region.

This is a very lively town with a index of old age which is considerably below the regional and inland average value. The analysis maps of the P.T.C.P. show the index of old age percentage is in a range between 130% - 150%. In the productive sector Montenero di Bisaccia is known as one of the major industrial districts in the province of Campobasso and this district includes the municipalities of Montenero, Mafalda, San Felice del Molise and Tavenna consisting of a area of 262 km sq. The district area comprises 700 local units mainly located in the municipality of Montenero (511 units, 73% of the total). The report on the provincial population engaged in industry (data ISTAT 2001) shows the largest concentration in the municipalities of Termoli, Campobasso and Montenero with more than 1,100 units. The employers in the trade sector (data ISTAT 2001) are mainly concentrated in Montenero. So it is possible to declare that Montenero is one of the main forces for the provincial economy.

The south-western hill slopes of Montenero are characterised by the presence of numerous caves excavated into the tufa. Due to the archaeological finds found in the

caves, it is possible to argue that these were inhabited middle Palaeolithic age onwards¹⁰ and they can therefore be designated as troglodytic dwellings. These cavities are frequently mentioned by a scholar of Montenero's history as part of the territory and culture of the inhabitants. Emilio Paterno, in the 1960s, described the caves as excavations of troglodyte origin but also as a tradition handed down to his day: *"The crypts or caves - with which the cliff on southwest of the hill appears perforated- are not all recent. There still excavated today and are what is left of the troglodyte tradition passed down to us from generation to generation. There are many, filled long ago, which – it does not seem strange to assert - date back to almost the prehistoric age."*¹¹ Located on the slopes of the tufa hill, the caves develop below the more recent historical centre of the municipality (Figure 4).



Figure 4 The artificial caves at Montenero di Bisaccia. It is clear that these caves are excavated in the hill slope and are often excavated on several levels (Photo: A. Maccarone, 2006).

The geology of the area has greatly influenced the development of the caves: the easily eroded tufa rock and the presence of water suggests that, probably, in origin these cavities were natural formations. Then primitive man, ignorant of excavation techniques, found refuge from the weather and animals here. Subsequently, however, these caves were also used by other peoples who settled in this place because of the

¹⁰ **Paterno Emilio Ambrogio**, *Storia di Montenero di Bisaccia – dalle origini ai nostri giorni*, Cooperativa Editoriale Tipografica Lanciano, 1969.

¹¹ Idem.

combination of factors including the presence of tufa rock and water, essential factors in the choice of settlement location. Probably the route of the drove road that passed through the territory of Montenero near the caves, was influenced by these two important environmental characteristics. Thus, caves were long used by the shepherds as temporary shelters in their long journey towards Puglia. A documentary source, such as the *Catasto onciario*, shows the presence in Montenero of 15 caves, described as “*1 cave in the old countryside, in the contrada of the road above the Fonte Cassù, 1 cave located in the Fonte Cassù that Stephen Gregory, 48 years old, (who lives on his own) uses as an animal shelter; 8 caves that have always been used as animal shelters in the same locality, 5 caves owned by the Duke for sheltering his pigs*”¹².

It is said that at the end of the 1800s, the largest cave was home to the Town Hall of Montenero di Bisaccia. Perhaps the last people that inhabited the caves were gypsies in the 1950s. In the 1970s, when the economy and way of life of the peasants changed, the remaining cave was used as stables and / or cellars, “*it seems that the most widespread use of caves was for animal shelter, especially black pigs or for wine and oil storage. The presence of the caves seems to replace the straw-built structures that are common in other places in Abruzzo and Molise*”¹³. These changes led to a gradual abandonment of the area and, therefore, neglect and weather caused the collapse and the loss of many ancient hypogean structures. But today we can still admire numerous caves, some of which overlapping each other. The actual status of these structures is, however, very degraded. Some were shut down to avoid the danger of hill collapse, others were entirely or partly cemented and are still used as a garage or sheds for storing agricultural tools. These caves are valorised and used by the community of Montenero in the Christmas period because some of these caves are used for the creation of a living nativity scene.

The caves are present in an area generally indicated by the population as the **caves area**. Probably the entire slope below the historical town was affected by the presence of these caves. The cave area is located in the south-west part of the town. This is the best for exposure artificial cavities used for housing. Therefore, it can be assumed that they really were inhabited in the past. Today, however, it is possible to see three distinct

¹² **Comune di Montenero di Bisaccia, Centro Italiano di Studi e di Documentazione sugli Abeti Mediterranei, Il sistema delle risorse ambientali e territoriali del comprensorio di Montenero di Bisaccia, quali possibili fattori di sviluppo locale. analisi ricognitiva ed azioni di tutela e valorizzazione**, Montenero di Bisaccia, 10 December 2001, pp. 42-43.

¹³ Idem.

groups of caves because of great deal of consolidating work undertaken on the hillside which has created gaps over the hill slope and at the same time removed many caves. From historical photos it can be seen that the hillside had a much greater density of caves than it does today. For the census the underground structures were divided into three groups located in three different areas.

These areas cannot be distinguished by names on maps, therefore they were described as the *nativity scene zone* used every year for the representation of the Christ's nativity; the *Fonte Cassù zone* where the caves are located in front of the spring; the *amphitheatre zone* where there are the caves left after a large intervention to consolidate the tufa wall, in the shape of an amphitheatre.

Twenty-nine (29) caves were found from the census of these three areas subdivided as follows:

- 11 caves in the nativity scene zone;
- 14 caves in the Fonte Cassù zone;
- 4 caves in the amphitheatre zone.

The territory of Montenero di Bisaccia, around these artificial cavities, is also marked by other environmental, historical and cultural emergencies such as the badlands of Montenero SIC, Fonte Cassù, the Sanctuary of the Madonna di Bisaccia and the Centurelle – Montesecco drove road (Figure 5).

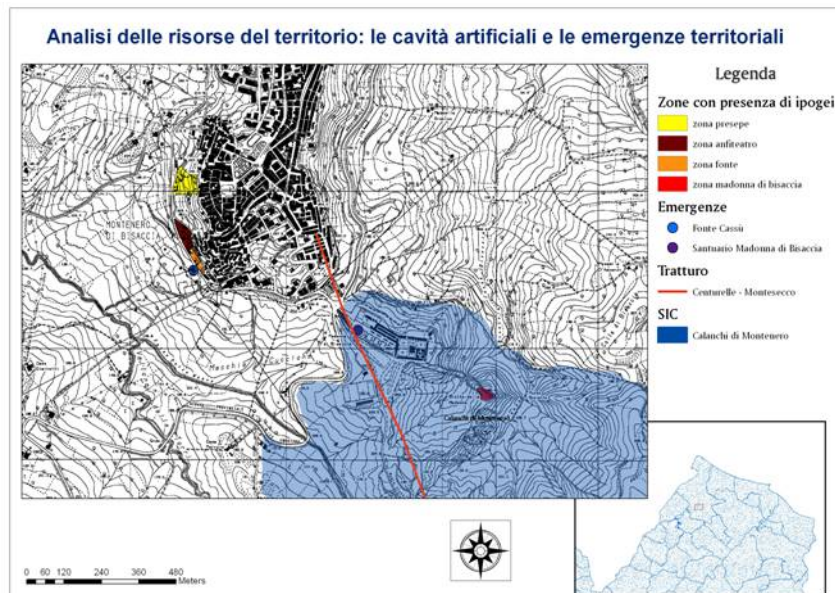


Figure 5 Analysis of the resources of the territory: the artificial caves subdivided into homogeneous zones and environmental, historical and cultural emergencies in Montenero.

The caves in the *nativity scene zone* are not accessible because they are enclosed by an external structures of wood and reeds. For this reason, the study of the cave complex was made from the ground below and from a road that climbs along the ridge from which one can see the complex below.

This complex consists of a series of overlapping cavities up to a level of three caves. The caves are the property of the municipality of Montenero and are well kept because they are used annually for nativity scene, while for the rest of the year they remain closed to the public.



Figure 6 The artificial cavities in the Creche zone of Montenero di Bisaccia. It is clear that they are excavated on several levels and are closed to visitors. (Photo: A. Maccarone, 2008).

The underground area of the this zone, like the other caves, has undergone restoration interventions and adjustment to better adapt it to the current use. Straw and wood structures and covers were built, which extended the useable space to the outside of the caves. Other extensions, however, were made of cement and tufa bricks, as seen in Figure 6. This enlargement on the ground floor was also used as a terrace for the upper level. Stairs and walkways were also created to link the different levels of caves.

The *Fonte Cassù zone* is so-called because it is near the spring named Cassù. This spring was an important place and also indicated by Paterno as the spring where Hannibal could have stopped when he was in Italy. In this zone there are many caves

that probably in the past formed a single complex with the nearby *amphitheatre zone* (Figure 7).



Figure 7 The artificial caves in the spring zone of Montenero di Bisaccia. The largest cave at Montenero can clearly be seen (Photo: A. Maccarone, 2008).

These caves were abandoned over time and today there are gaps in the rock often used as rubbish tips. Other gaps have been walled to prevent the wall above from collapsing and others have been reinforced by concrete walls to stabilise the slope. This area is the largest area of caves that found in the territory which, as mentioned earlier, may have been used in the 1800s as the Town Hall. In this area a historical comparison was attempted using a vintage postcard, probably dating to the late 1950s, and recent photos. The postcard shows the caves present along the ridge in front of the Cassù spring. As can be seen from diachronic comparison in Figure 8, the current situation presents a reduced number of caves and more negligence. Because of that the area is covered by natural vegetation that sometimes covers the entry to some caves. Some caves in the highest part of the hill are no longer visible but it is unclear whether they have been closed or are only hidden by vegetation. On the right the photo shows a supporting wall that was built along the road and has taken the place of various underground structures. In the 1950s, the caves were used as chicken runs and today, as seen from the structures

that were built behind the supporting wall, they are used as storage for agricultural machinery and tools.



Figure 8 The artificial caves in the spring zone of Montenero di Bisaccia. Diachronic comparison between the 1950s and 2000 (Source: Archivio Storico Fotografico Antonio Assogna, Photo Giorgio Pezzetta, anni '50; Photo: A. Maccarone, 2008).

In the *amphitheatre zone* there are only four caves but it is thought that they were many more and in spatial continuity with the Fonte Cassù complex but, due to the consolidation of the hillside, they were demolished with consequent loss of much of the memory of the place. Only the upper hypogean structures remain, as can be seen from the picture, that have also been extended with external structures. Today these caves are difficult to reach because they are covered by dense vegetation and there is no access road.

An example of a catalogue card for the caves is shown in Figure 9.

Finally, an underground cult site was found in the zone of Madonna di Bisaccia. This cave is named the Grotto of Madonna di Bisaccia. So in the municipality of Montenero 30 artificial caves were found.

This cult cavity is situated below a tufa boulder shown in Figure 10.



1. IDENTIFICAZIONE			
PROVINCIA	Campanha	COORDINATE	41°45'00"
COMUNE	Montenero di Bisaccia	GEOMETRICHE	147°29'2"
LOCALITÀ	Zona Rotta	ORIENTAMENTO	OVEST
		CODICE	0222M
2. POSIZIONE			
Nel centro abitato		<input type="checkbox"/> In territorio agricolo	
In insediamento spoglio		<input type="checkbox"/> Vicina ad altre valenze ambientali	
Cavità isolata		<input type="checkbox"/> Vicina ad altre valenze storico-culturali	
3. TIPOLOGIA			
Opere di estrazione	<input type="checkbox"/>	FUNZIONE	
Opere idrauliche	<input type="checkbox"/>	ORIGINARIA	
Opere di culto	<input type="checkbox"/>	FUNZIONE	Abbandonata
Opere di uso funerario	<input type="checkbox"/>	ATTUALE	
Opere di uso civile	<input type="checkbox"/>	PROPRIETÀ	
Opere di uso militare	<input type="checkbox"/>		
Opere non identificate	<input type="checkbox"/>		
4. CARATTERISTICHE TECNICHE			
MATERIE	Tufo calcareo, cemento	DESCRIZIONE DELLA CAVITÀ	
INGRESSO	Aperto e molto grande	La cavità è molto grande. È scavata interamente nel tufo ed è profonda almeno 3 metri. La parete esterna rivela chiosa laterale da blocchi di calcare che sorreggono una trave in cemento. Internamente sono stati realizzati muri di sostegno in blocchi di laterizio, anche la parete di fondo è stata chiusa con muratura in laterizio.	
ALTRE APERTURE	Finestre		
DECORAZIONI	No		
ALTRI ELEMENTI ARCHITETTONICI	No		
Possibilità di rilievo interno	No		
Stato di conservazione	Buono	Sopra la porta c'è una finestra e altre due più piccole. Questa risulta essere la cavità più grande dell'intero insediamento spoglio.	
5. CARTOGRAFIA DI RIFERIMENTO		6. RILIEVO FOTO	
7. FONTI			
LETTERATURA E DOCUMENTI STORICI			
Paterno Emilio Ambrogio, Montenero di Bisaccia, Pescara: Casa Editrice Acta della Stampa, 1963.			
Paterno Emilio Ambrogio, Storia di Montenero di Bisaccia - dalle origini ai nostri giorni, Lanciano: Cooperativa Editoriale Tipografica Lanciano, 1969.			
8. STRUMENTI DI PIANIFICAZIONE			
PRG	<input type="checkbox"/>	PTCP	<input type="checkbox"/>
PRG	<input checked="" type="checkbox"/>	PTPAVV	<input checked="" type="checkbox"/>
		COMPLESSIVITÀ	
		Alessandra Maccarone	

Figure 9 The compiled datasheet for a cave in the Creche zone. On the right a photo of the cave in the middle of the historical centre of Montenero di Bisaccia (Photo: A. Maccarone, 2008).



Figure 10 A tufa boulder below which is the Grotto of Madonna di Bisaccia. This boulder is on the top of the badlands area of Montenero. It was a sacred area for the early Christians; then, it was used by monks, who kept a picture of the Madonna there (Photo: A. Maccarone, 2006).

This rock is of marine origin and stands out in the badlands zone of Montenero. The cave, cut into the tufa walls, is about two meters high, almost square in shape (two sides measuring four meters, the other just below), and has a number of niches in its walls. The floor is covered with over one meter of alluvial deposits and straw because, until recently, it was used as sheepfold (illegally). This was where early Christians gathered to escape persecution. It is believed that the typical karstic erosion of area has led to the loss of all traces of paintings and frescoes on the walls of the cult cave. The cave was used by Basilian monks who kept a picture of Madonna here.

This picture was hidden in the cave, for fear of iconoclastic persecution which aimed to destroy all the sacred images, especially the ones of the Madonna. Today the cave is of no artistic value because it was stripped of everything, even the picture of the Madonna di Bisaccia that is now guarded in the Sanctuary built on the hill in front of the rock.

As regards territorial management an analysis was made of the urban planning tools and their attention to these emergencies.

Currently the Urban Tool is the P.R.G. variant approved by Resolution No. 181 in date of 30 April 2002. This instrument, illustrated in Figure 11, classified the zone examined in this research as a *“buffer zone with sandstone caves. Within this zone any action which may arise to change the status of sites is prohibited. In particular, works which may damage the stability of existing caves and land in general are prohibited. The cave environment must be returned to its natural state by removing added elements”*¹⁴.

¹⁴ Article No. 38 of the Norme Tecniche di Attuazione of the P.R.G variant of the Municipalità of Montenero di Bisaccia dated 2002.

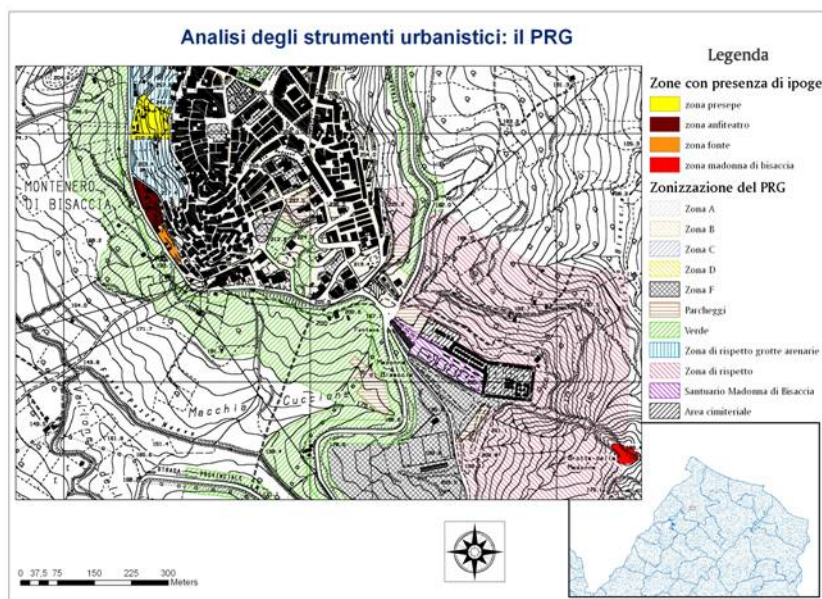


Figure 11 Zoning at Montenero di Bisaccia PRG. This shows how all the zones characterised by the caves are in a buffer zone.

The local administration has paid attention to the cave area but has not implemented actions to prevent the abandonment of the area and urban decay.

The P.R.G. is not the only planning tool because the territory of Montenero di Bisaccia is included in area of P.T.P.A.A.V. No. 1 of the Molise Region and in the area of the P.T.C.P. of Campobasso Province. Therefore, there are also plans on a higher level that could put into practice terms of protection for such emergencies.

The P.T.C.P. tools do not mention this type of emergency in all the three case studies. There are no traces of these hypogean settlements in the document and, consequently, no type of protection.

The map analysis of the P.T.P.A.A.V. No 1, approved by the Regional Council Resolution No. 253 dated 01-10-97 does not report any feedback regarding the artificial caves.

Conclusions and future prospects

This work helped to identify, catalogue and georeference all hypogean structures in the territories of the three case studies. It has also begun to implement a Geographical Information System to manage all the information derived from surveys and research conducted.

This Geographical Information System for the hypogean landscape of the Molise will aim to prepare thematic maps such as the Map of the presence of artificial cavities in Molise, the map of hypogean density, the map of the probability to find caves in land with the similar characteristics. This Geographical Information System will also be a tool to support the implementation of some proposals for management of underground settlement and to valorise this areas. This tools will be implemented also the comparison with other national and foreign realties of the Mediterranean basin such as the case of Matera (Basilicata, Italy) and the hypogean settlements of Guadix (Andalusia, Spain), especially in terms of management and conservation of these history heritages.

In the Montenero case study, it is clear as only the P.R.G. considers the caves area below the historical centre. As for the other two case studies, it can be argued that none of the planning tools in force in the territory will consider this type of landscape or historical and cultural asset to be safeguarded. The main problem therefore is the lack of attention in the region towards structures linked to the rural vocation and tell about the intense relationship between environment and men which is an important part of the history of Molise populations.

This paper will attempt, in conclusion, to indicate the guidelines for the conservation, enhancement and enjoyment for the hypogean heritage of the Molise so that it can be witness to a way of life that has always placed the man in correlation with the environment and that has changed the landscape. The conservation of landscapes that bear witness to the history of our country has a considerable importance in this period when many of us have lost their roots and their origins.

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