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Interaction Among Social, Cultural and Environmental Factors in Vernacular Settlements. The Case of Korogonianika, in Lakonia, Greece

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The article presents the main findings of a research focusing on the unique attributes of vernacular architectural heritage of Southern Greece. The analysis of the interaction between social, cultural and environmental factors, is based on literature review and field work. This interaction is portrayed through the use of a pilot case study, the village Korogonianika which is a typical and representative example for all vernacular settlements of eastern Mani. Field work involves original cartographic depiction, photos, drawings as well as participant observation and interviews.

Keywords: Greek vernacular settlements, environmental assessment, socio-spatial interaction, sustainability.

Introduction

According to literature, the term vernacular architecture describes the type of architecture that is aligned with local environmental, socio-economic and cultural circumstances, constructed during the pre-industrial era (Petronotis, 1980). In most of the cases, vernacular architecture involves structures made by local residents. The usage of local materials and the adjustment to the local climate conditions are the two main factors that contribute to the sustainability of vernacular settlements (Lejeune, 2010). In most of the cases, vernacular settlements reflect an ongoing interaction among socio-economic, cultural and environmental factors.

The selected case study, a village in the Prefecture of Eastern Mani, belongs to the regional administrative area of Peloponnese. It could be described as a typical case study of the vernacular settlements of southern Greece. This Peninsula includes 40 dispersed vernacular settlements protected by national legislation Law ΦΕΚ 594/Δ/78. This law enforces specific morphological rules and regulations. Archaeological findings in the area reveal settlements that date back to the Paleolithic and Neolithic Era (Chapin, et.al. 2014). Moreover, pertinent literature stresses the



nodal role of the area during the Mycenaean Era and the Bronze Age (Cavanagh et.al., 2009). Findings around 330 A.D. give prominence to the correlation between spatial and socio-economic parameters. Thus, the production of space reflects not only the principles of an introverted local community but also the limitations of the natural surroundings (Saitas, 2001).

The residential patterns met at this early stage of organized settlements are based on local resources and materials as well as small scale socio-spatial networks. In particular, the rough, barren and anhydrous natural scenery determined the production of space and the social physiognomy of the area. The precarious living conditions because of the pirates' incursions combined with the lack of natural resources, led to the creation of armed patriarchal clans as the basic pattern of socio-spatial structure in the area (ibid). These clans struggled for survival and independence. The rigid codex of principles that affected the organization of vernacular settlements in Mani has been documented since the period 330-1453 A.D. (ibid).

The Christianization procedure of 10th -12th century and the period of Frankish Occupation (1249-1262) contributed to the formation of the cultural identity of the area. In particular, most of the vernacular settlements of the area constructed between the years 1263-1453, had been established by members of the Despotate of Mystras, a semi-autonomous province of the Byzantine Empire, flourishing between 14th and 15th century A.D. Most of them kept the name of the prominent member of the Despotate of Mystras that establish them, as in the case of Korogonianika (*Village of Korogona*, Koutsilieris, 1993). Despite the slight differences between northern and southern vernacular settlements of Mani, there are common spatial and social patterns that characterize the construction of buildings, the spatial organization of each settlement and the materials used. This research explores, through the pilot case study, the interaction among socio-economic, cultural and environmental factors. The article attempts to provide interpretations for the physiognomy of the settlement as a whole and the type of buildings met in the area.

The research comprises field work and literature review on the issue of vernacular settlements in the area of study. The author has visited numerous vernacular settlements in Mani, Lakonia with the view to organize their main features as far as environmental and socio-economic factors are concerned, focusing on their interaction. Furthermore, the author conducted participant observation in the selected pilot case study, the village of Korogonianika. The author studied the socio-spatial patterns of the contemporary inhabitants during the summer period and collected information, emphasizing on the use of buildings during the winter period. The author tried to interpret the contemporary physiognomy of the village as far as its location and spatial organization is concerned, as well as the underlying reasons for the construction of the specific architectural forms met in the village. Observation and cartographic depiction combined with literature review, offered useful information about the forms and structures. Interviews with the owners of the vernacular houses were necessary so as to collect information about the current use of the houses. Qualitative research is based on purposive sampling, which is organized in the context of pre-selected criteria, relevant to particular research questions. Fifteen owners took part in the research. The research started in 2015 during author's attendance in the post-graduate program "Environmental Design of Cities and Buildings" at Hellenic Open University and was enriched and updated during 2019. Field work includes surveying and original cartographic depiction of the selected case study, original architectural drawings of the main housing types and semi-structured interviews with residents.

Spatial expressions of socio-economic and cultural factors

The village of Korogonianika, as the majority of vernacular settlements in Mani, could be described as an undivided unit consisting of the main core and its' extensions. According to National Census data of the year 1856, the wider area of Lagia District, where the village Korogonianika belongs,

Methods

Results and Discussion

had 1776 inhabitants. The population rate was on the increase until the mid-20th century. After the World War II and the Civil War, the majority of the inhabitants of the wider area, migrated to urban areas, mostly in the urban agglomeration of Athens -Piraeus (Leontidou, 2001). Since then, there have been recorded only a few permanent citizens. Census data of 2001, present only 29 permanent citizens while field work has revealed that today there are only 4 permanent citizens. The village has 32 building complexes. Fifteen of them are abandoned and fifteen of them are occupied only during the summer period. Only two houses are occupied during the whole year. Today, the majority of vernacular settlements of eastern Mani, have only few permanent residents.

All the constructions had defensive character in order to avoid intruders. This character was expressed through structural elements on the outer side of each building. Some examples are the niche-standpoints and the loopholes in the wall. Another interesting architectural feature is a type of special construction that could be used from the inside so as to pour hot water or oil on the enemies. Another attribute of the vernacular settlements of Mani, is the proximity of each housing unit to the other. This is observed only for residences belonging to members of the same clan, as recorded during field work in the village Korogonianika (see map 1). The ulterior motive was to found shielding enclaves that could protect the clan in case of an invasion. According to field work the settlement took its complete form during the 19th century. Korogonianika had been gradually expanding, keeping as a point of reference Bofos' tower (see map 1). It is until today the only high-rise structure of the village (Fig.2).

Map 1

The main core of the vernacular settlement and the two phases of expansion, Bofos' Tower within the circle, field work, author's work

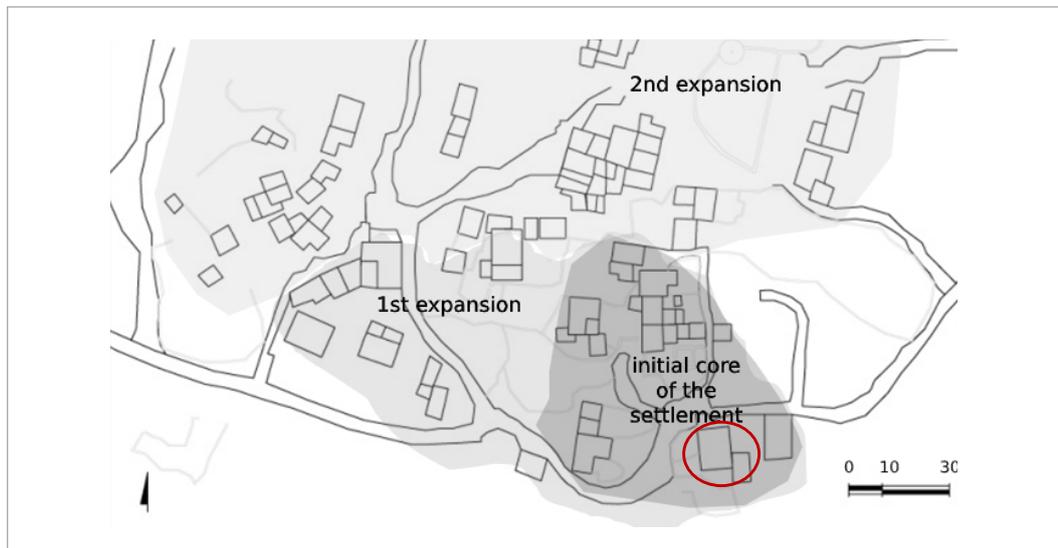


Fig. 2

The southern side of the settlement of Korogonianika, author's photograph 2019. On the right is the tower that belongs to Bofos' Family



This difference among constructions reflects discrepancies on social level. Taking into account local cultural values, male-ruled, blood related clans were supposed to be powerful. They had the privilege to build high rise stone-made buildings, while all the others had been forced to keep a low height for their constructions. As a result, two main types of architectural synthesis are observed in Mani's vernacular agglomerations, as in the case of Korogonianika. The first type is the rectangle-shaped tower (Fig.3) and the other includes ground floor constructions with mezzanine in Γ-like shape (Fig.4). Transoms are rather low in all constructions, at about 1.5 meters as measured from the upper side of the floor. This short height of doors is owed to the defensive character of the house. Since it did not facilitate a convenient entrance, it was considered to be a suitable strategy so as to repel invaders, as stated by the owners of the houses during the interviews. Nuclear families and extended families with plenty of sons and grad-sons were allowed to use higher quality materials for the construction of their houses (Kassis, 1980). Privileged members of the patriarchic clans, forced families with daughters to use lower quality materials. This fact made the constructions vulnerable and easy to demolish. This issue could be perceived as an explicit spatial depiction of gender discrimination (ibid).

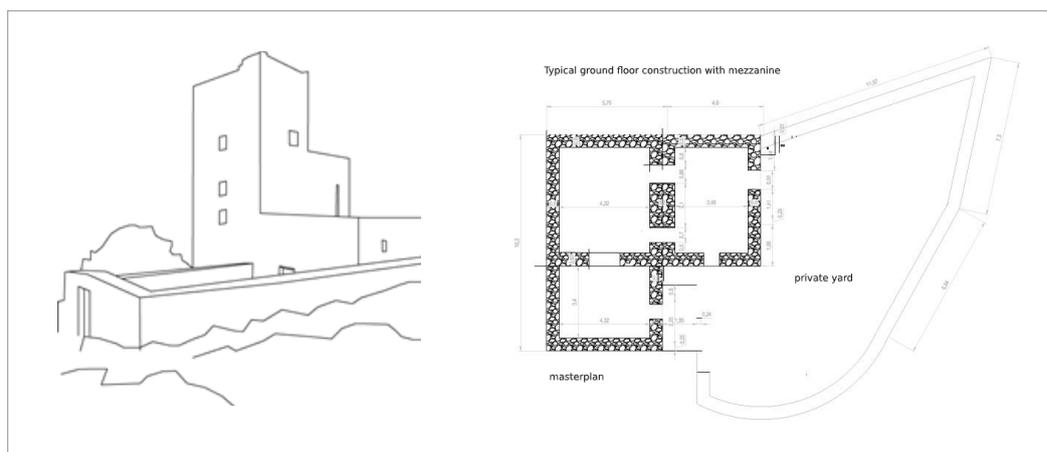


Fig. 3, 4

3d View of Bofos' Tower and Γ-shape plan of a ground floor construction. The two typical housing types met in the village, author's drawings, field work

In any case, all the constructions and land properties were bestowed only to the male descendants. As for the housing facilities, all houses high rise or not, have until today tanks so as to store rainwater for household use. Field work has revealed that the village was connected to the national electricity supply network in 1987. The connection to the national fixed telecommunication network was not fulfilled before the mid-90s. In account of all these, all houses had until recently poor facilities.

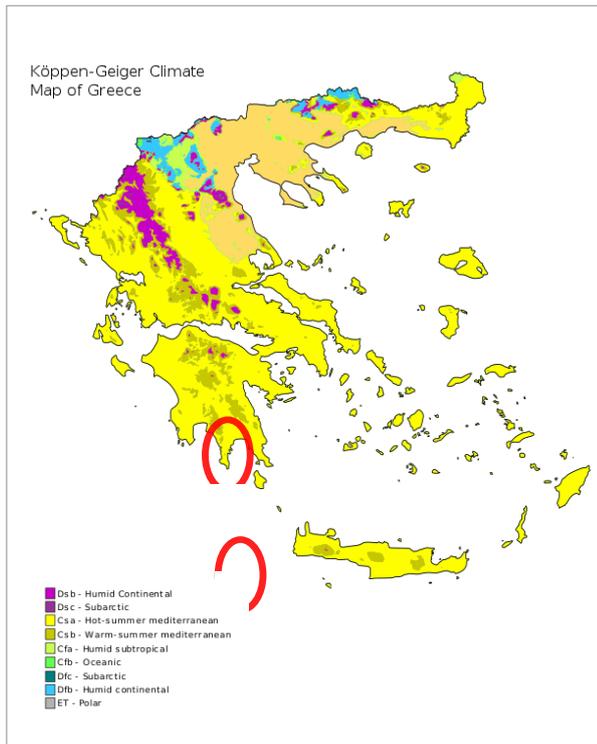
Environmental assessment

Location and spatial organization of the settlement

Apart from the socio-economic and cultural factors, environmental parameters played a predominant role in the production of living space. Basic elements of the natural environment as the mountain range of Taygetos transfuse semi-mountainous characteristics to the majority of the vernacular settlements of the area of Mani, as in the case of Korogonianika. The length of the mountain range is 75 Km and the width varies between 10 and 20 Km., its height varies from 300 to 1214 m. There is also a plateau where the selected case study is located, at about 350m height. All the settlements were located far from the coastal zone, in the mainland. Taking into consideration the morphology of the scenery, these settlements were geographically isolated from other rural areas of Peloponnese. Thus, all settlements were secluded and difficult to connect with each

Map 5

Greece map of Köppen climate classification



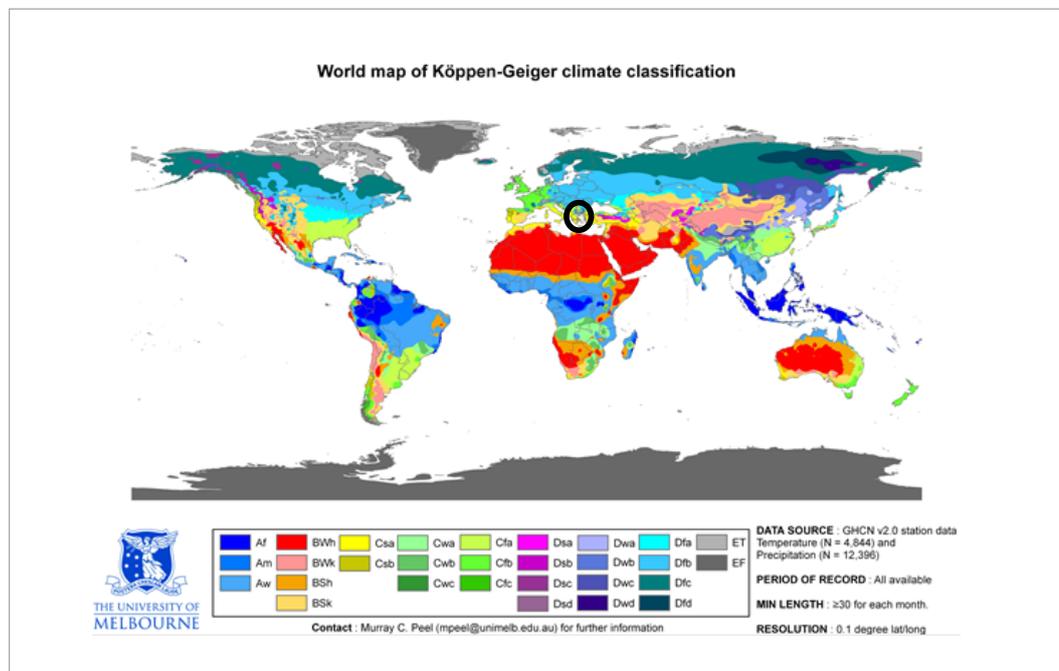
Available at [https://el.wikipedia.org/wiki/%CE%91%CF%81%CF%87%CE%B5%CE%AF%CE%BF:Greece_map_of_K%C3%B6ppen_climate_classification_\(new\).svg](https://el.wikipedia.org/wiki/%CE%91%CF%81%CF%87%CE%B5%CE%AF%CE%BF:Greece_map_of_K%C3%B6ppen_climate_classification_(new).svg). The described area, the District of Mani, Lakonia, is indicated with the red circle

other. In these introverted communities, the regime of patriarchic clans, as described before, was the norm that ruled every aspect of daily life.

As for the climate conditions, according to the Koeppen-Geiger Map of Greece (Map 5,6), the area of study is characterized as "hot summer Mediterranean". It is an area with high temperatures during the summer period, low level of humidity during the whole year and moderate temperatures during the winter. It is important to mention that during the winter, high winds are recorded. This climatological feature was estimated by traditional craftsmen that chose favorable locations for each and every settlement. The selected positions provided shelter from the wind. Another important characteristic is the kind of vegetation met in the area and the available local natural resources. To be more specific, this type of arid climate is associated with indigenous low height flora, mostly bushes and shreds as thyme

Map 6

Greece as depicted in the Köppen climate classification



«File:World!Koppen!Map!.png" by Murray C. Peel is licensed under CC BY-SA 4.0, available at <https://search.creativecommons.org/photos/1b973098-fa0b-4ff8-b204-0fce08a7938>

and prickly pears. The only indigenous trees are olive trees. Fertile enclaves are only rare. The area they cover is usually small. From this point of view, the lack of soil fertility was a crucial factor that affected the socio-economic structure of these settlements until the 50s, when massive internal migration was documented.

As for the orientation of each settlement two types have been documented in the area of Mani (Saitas, 2001). The first type is met in cases where the whole settlement is constructed along a hillside. In such cases, the long side of each house is placed vertical to the contour lines while the narrow one is facing the slope, which has usually view to the sea. The second type is met when the settlement is placed on a plateau, like the selected case study. The main core of the settlement was aligned with the downwind side of the slope, so as to protect all constructions from the high wind (Map 1).

Each settlement has various public and private open spaces, usually oriented south or south east, so as to reap the maximum benefits of sunlight. The most popular one is a type of plateau, called in the local dialect "Rouga". It could be described as the precursor of the square, during the late medieval era in Greece. In most cases, vernacular settlements have at least two of them, the lower and the upper. Having a nodal role (Lynch, 1960 "nodes"), they organized neighborhood networks, accommodating social interaction in the micro-scale of the settlement, offering as well thermal comfort because of their favorable location. Another important element in terms of environmental assessment, is associated with the analogies between the width of each path and the height of surrounding buildings. This varies from 1:1 to 1:1.5 as estimated during field work. This analogy offers sufficient sunlight for a latitude of 36°. This type of spatial organization eliminates the phenomenon of overlapping shadows met in modern metropolitan areas. Thus, all public parts of the settlement support not only social interaction but also improve microclimate conditions inside the settlement.

Buildings: Materials, construction methods and architectural elements

As far as the buildings are concerned, the axis of the long side is aligned to the east-west direction so as to place the main entrance at the southern side (see map 1). Another typical feature of the vernacular architecture of Mani is the small size of doors and windows. This feature is associated with the effort to minimize thermal exchange between the interior and the exterior. This means that, besides socio-cultural reasons, environmental conditions affected the size and location of windows and doors. In most of the cases, the windows are placed on the southern or southeastern façade which is usually the long one. There are no windows on the northern side of the house. Other small openings along the south or the southeast façade have been documented so as to enrich the amount of natural light entering the house during the winter period. As for the natural ventilation, most of the vernacular houses of Mani, have a special opening above kitchen's ceiling that functions as a cooling tower. Despite all the effort, houses constructed before the 20th century do not offer cross-ventilation. Inefficient ventilation and poor natural daylight are the main disadvantages of this type of vernacular architecture.

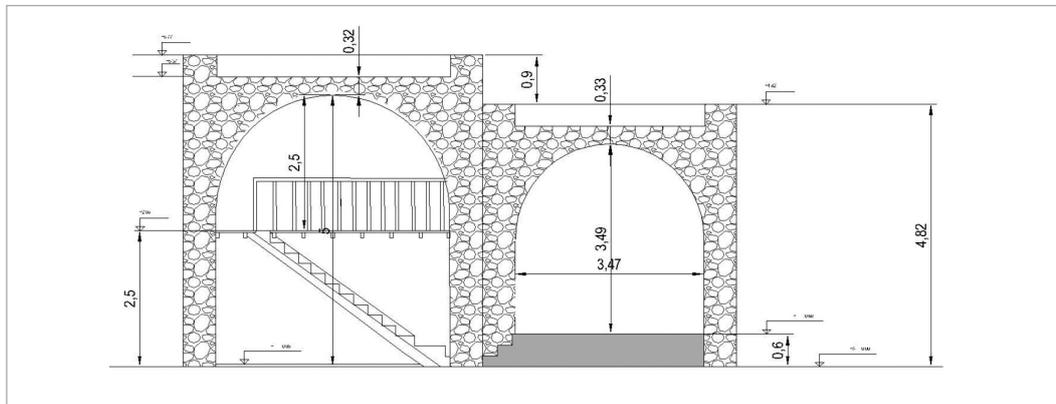
Describing the issue of thermal comfort, the interviews revealed that these vernacular constructions exercise high environmental performance during summer and winter mostly because of the high thermal inertia of stone. The majority of the owners reported only limited use of artificial means for cooling during the summer period, mostly fans. As for the winter, a central heating system is rarely documented. When the houses are used during the winter period, the owners prefer gas heaters.

As far as materials are concerned, all constructions are built with load-bearing masonry from local limestone. Documentation of these settlements has highlighted the phenomenon of consecutive

constructions, using architectural parts of antecedent periods (Saitas,2001). Traditional craftsmen seemed to be aware of the perilous seismic activity in the area. Earthquakes had long been a potentially hazardous environmental factor, that all constructions had to take into account. From this point of view, the year 1850 is considered to be a milestone for the evolution of local constructions because of the use of lime plaster in internal and external stone-made masonry. This element reinforced the stability of each construction, reducing the width of masonry. Moreover, this new material contributed to the creation of load-bearing arches at the upper part of the internal masonry. The load-bearing arches, visible only from the inside facilitated the creation of rooms with larger width. This innovation of the mid-19th century, improved the prevailing living conditions in the vernacular settlements of Mani. The higher point of each arch is calculated at about 3.5 meters, according to field work. For houses with a mezzanine, the higher point of the arch is at about 5 meters as calculated from the inside (fig.7). These architectural elements are found at the village of Korogonianika as well as in the majority of the vernacular settlements of Mani.

Fig. 7

Section depicting a typical ground floor construction with load-bearing arches, in the village Korogonianika, authors work



Nonetheless, Mediterranean vernacular architecture is an example for seismic protection, presenting numerous solutions that could help contemporary constructions (Correia, et.al, 2015). Following its general principles, these buildings present stable connections among all structural parts. Another important feature is associated with the reduction of construction weight in accordance with the height of construction. Thus, smaller and lighter stones were chosen for the upper part of the masonry. Field work has revealed that most of these constructions have provision for horizontal seismic stresses. The use of horizontal wooden beams is an indicator for this assumption. Taking into account all these, these vernacular building shells are well adjusted to the environmental conditions offering solutions for a variety of issues, despite the previously mentioned flaws.

Conclusions

The production of space in vernacular settlements of Southern Greece has followed environmental principles affected by socio-economic parameters and cultural values. The interaction between them has led to specific socio-spatial patterns. The once isolated areas of Mani, ruled by blood-related clans, offered poor local resources. These stone-made constructions were the only available option. The effort to achieve maximum thermal comfort both the summer and winter period, has contributed to numerous sustainable architectural solutions. The selection of south or south east orientation and the downwind locations are just a few of them. In addition, the thermal inertial of stone combined with the small windows and doors limited the heat exchange between the internal and external environment. There are though some disadvantages related to the choice of small openings on the façades. The main problem is associated with the inefficient sunlight that penetrates inside the house while also the lack of cross ventilation is considered to be significant. Today mechanical interventions have ameliorated the former difficult living conditions. However, in most of the cases, these houses do not achieve to reach the facilities that contemporary constructions offer. From this point of view, there are numerous challenges, despite their significance in

terms of cultural heritage. Apart from the building shell itself, the lack of facilities and services combined with the limited employment opportunities make these communities far less competent than the nearby towns and metropolitan areas. Numbers of permanent citizens decline year after year, leading to absolute desolation. Side effects of this situation are associated with the poor preservation of vernacular building shells, which are in many cases left in despair. From this point of view, the lack of permanent population in such communities should be considered as a major factor that hinders sustainability in terms of social and spatial cohesion.

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