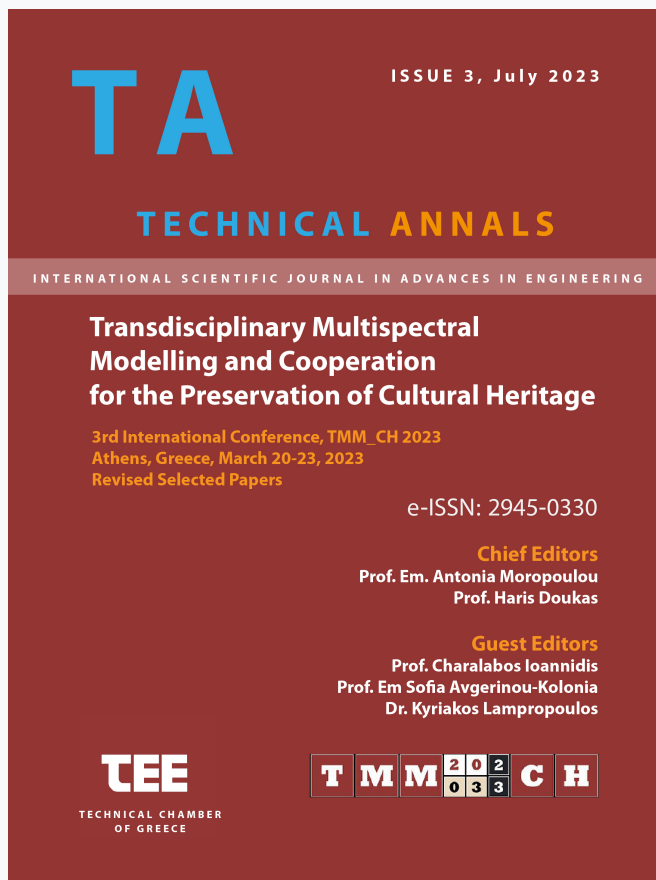


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Redefinition of Rural Spaces: A Methodological Tool

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Abstract. The desolation of rural areas and historic settlements is a particularly intense phenomenon in recent decades. Gradually, the tradition and history of these places are being worn away leading to the alteration of their identity. The economy is monopolized by the service and tourism sectors and quite often, this converts them into a seasonal touristic product.

The "redefinition" of the rural space is a necessary condition in order to formulate a sustainable strategic plan which will respond to contemporary needs and at the same time, respect the uniqueness of the place and preserve its cultural identity. This paper attempts to highlight a methodological tool for the planning of the rural areas, in terms of protecting and promoting them, on the occasion of the research carried out for the broader region of Fodele village, in northern Heraklion (Crete).

A key element for the research is the utilization of endogenous resources and their correlation with extraneous trends. Using this tool, conceptual networks of different resource types are created. By projecting these networks onto the space, and taking into consideration geospatial criteria (proximity, topography, type of resource), spatial units of particular identity are being formed. Resources- networks of social type - and stakeholders co-act to implement a strategic plan for the revitalization and promotion of the spatial units (anthropogenic and physical environment).

The procedure relates to a system of successive space readings and interpretative mapping at multiple scales. The conclusions derived from each stage lead to the next. Ultimately, this interdisciplinary process forms the essential background and design principles, for the articulation of a comprehensive strategic plan, aiming at the revitalization of the rural space and its sustainable development/enhancement (cultural, heritage, economic, environmental, etc.) in contemporary terms.

Keywords: Rural space, planning, endogenous resources, interdisciplinary, documentation, interpretative mapping, strategic plan, sustainable development.

1 Introduction

Nowadays alteration in the character of the traditional settlements of the greek countryside, which is related to the transition from the primary and secondary to the tertiary sector of the economy is observed. This economic change has led the local, working population to abandon the rural settlements and move into large urban centers for studies and employment. This results in the gradual dereliction or transformation of the rural and pastoral settlements that once formed the core of the Greek economy and culture.

A particular case is that of areas of outstanding natural beauty, where the focus is on the exploitation of the area by the tourism sector. As a rule, in Greece this category includes coastal areas and islands. The major problem lies in the fact that the massive influx of tourists tends to turn settlements and entire areas into a touristic product - a theme park for seasonal use. The ephemeral, consumerist nature of mass tourism, and the obsessive reliance on it as a key pillar of the economy, brings temporary economic relief while causing significant degradation of the natural and man-made environment with negative effects on culture and society. The motive is to prevent the deterioration of the character of the settlements, their degradation and their total or seasonal abandonment. The social and economic regeneration of rural areas with cultural and natural richness requires their redefinition in terms of sustainability and long-term resilience.

The methodological tool for analyzing and planning rural areas described in this paper attempts to provide a solution to the above-mentioned problem and involves the formulation of a strategic plan of action that responds to the contemporary needs of society, respects the uniqueness of the place and unveils its particular culture. This research was carried out in the context of a diploma project for the broader region of Fodele village, in northern Heraklion (Crete) [1].

The identification of the area of study involves primary and secondary research, and interpretative mapping at different scales, focusing on the qualitative characteristics identified at each level that can attract old and new users, capable of utilizing the place as a whole and in the long-term. The conclusions reached after the completion of each phase of the design methodology are the starting point for the next level of site identification.

The systematic detection and classification of these intrinsic spatial and social characteristics throughout the successive focusing stages is one of the most important tools in the identification of a locale. By linking similar qualitative characteristics, called endogenous resources, networks of activities of common interest are created. The spatial footprint of different resources in combination with constraints or facilitations imposed by the existing environment define unique spatial units. The qualitative or quantitative predominance of similar resources in the mix of spatial and social characteristics identified reveals the identity of each spatial unit. Finally, based on this identity, the users' profile and the directions of activities and interventions proposed to be implemented, in order to achieve the regeneration of the area under new conditions, are defined.

2 Broader Study Area

Heraklion, Crete, is chosen as a study area, specifically a part of the northern side of the district of Malevizi, which is defined based on geomorphological and qualitative factors. To the north and east, its boundary is defined by the coastline of the island, to the south by the Gorge of Almyros and the wildlife refuge that interrupts the possibility of human activity, and to the west by the valley of Fodele crossed by the Pantomatrix River.[2]

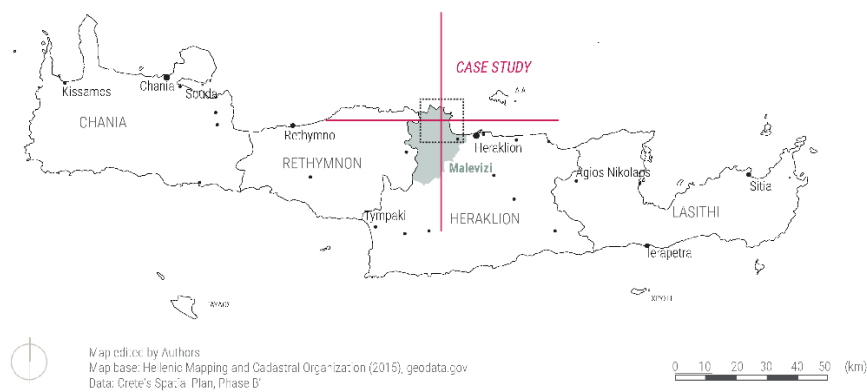


Fig. 1. Case study area [3]

As shown in Fig. 1, the area is located ~30 kilometers away from Heraklion city. Access to the area is provided primarily by the Northern Highway of Crete in the coastal part of the municipality, and secondarily by the regional road network in the highlands. The inland parts of the municipality are inaccessible and rarely visited. The Earth cover map [4] shows large areas of olive groves, vineyards and sclerophyll vegetation, revealing the predominantly agricultural and stockbreeding occupation of the local population until a few decades ago. [5]

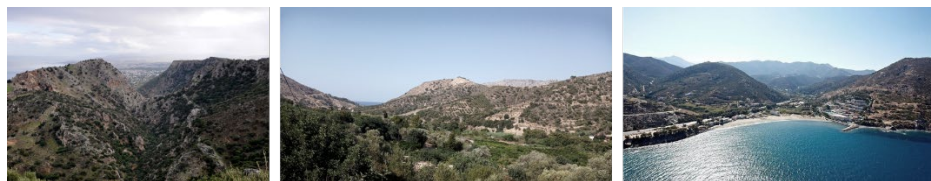


Fig. 2. Almyros gorge, Fodele valley, Coastal front respectively

Of particular interest, are the spatial contradictions of the study area as shown in Fig. 2. On the one hand there is the inland with the protected areas of natural beauty and

wildlife, such as part of the international geopark of Psiloritis mountain¹, and on the other hand the coastal front with the huge hotel units and the zones of degraded landscape due to mass tourism.

The mapping and statistical analysis (Fig. 3.) of the settlements are in the stage of economic transition from the primary to the tertiary sector. The spatial footprint of this phenomenon is the desertification of the lowland and mountain settlements in the inland areas and the significant distortion of the cultural and natural heritage of the coastal settlements. These observations have led to the selection of the specific study area, which is a suitable ground for the application of the proposed methodological tool.

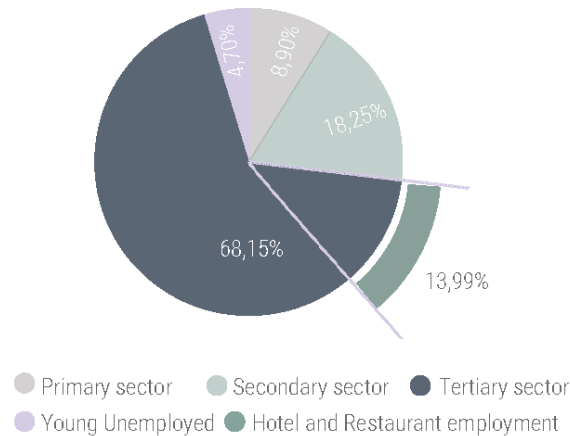


Fig. 3. Statistical data of employment divided by sectors

3 Stage 1: Spatial Unit Formation

The first phase of identification of the broader study area aims to understand its unique characteristics and is carried out by mapping endogenous resources, which are national and international landmarks.

The resources of the study area, which are initially identified over an area of 85.500 km², have similarities that allow them to be classified into seven categories: historical, religious, natural, geological, aquatic, residential and social. These categories relate to intrinsic qualitative characteristics of both the natural and man-made environment and

¹Psiloritis Geopark belongs to the UNESCO International Network of Geoparks, and is characterized as an area of particular geological importance, uniqueness and beauty, in order to preserve its geological heritage. Within and outside the geopark, the territory is also covered by Natura 2000 sites and wildlife refuges for the protection of endemic fauna and flora. As a whole, they constitute endogenous resources of national and international importance, defining the specific identity of the natural landscape of Heraklion County.

the social practices that have developed over the centuries. Religious resources include local monasteries and churches; natural, forests and gorges; geological, rocks and caves; historical, ancient monuments, Venetian, Ottoman, modern history and museums; residential resources relate to accommodation, aquatic resources include beaches, waterfalls, wetlands and rivers and finally social resources include administrative authorities, associations, cooperatives, educational structures and other initiatives for organizing the social life of the area.

The first level of processing involves the creation of cognitive networks, that results from linearly connecting the points of interest that belong to the same category. This process, although still abstract, shows the tendency to unify and strengthen common qualitative characteristics, which could lead to the promotion of these characteristics, and the attraction of the appropriate users to whom each network is relevant to. At the same time, the projection of these coexisting network sin the area, reveals the rich, multi-layered facet of the endogenous characteristics, on which the area's revitalization can be based on. The categories of the identified networks define the general axes of intrinsic activities that can be strengthened, while the density of the endogenous resources of each network reveals the qualitative and quantitative predominance of each characteristic.

In the next stage of this phase, the spatial footprint of endogenous resources is recognised. In particular, the point-endogenous resources identified, are projected on the ground and then a radius of influence is defined for each one. The length of the radius is determined by the area occupied by the resource and the scope of influence. Then, the area of influence created is adjusted according to geospatial constraints and qualitative factors. Thus, the initial circular range of influence of each resource takes on an irregular shape as shown in Fig. 4. Similar resources tend to be attracted, conflicting uses tend to be repelled, while spatial links or barriers affecting communication between resources are considered. The deformation factors are briefly three: proximity, topography and accessibility.

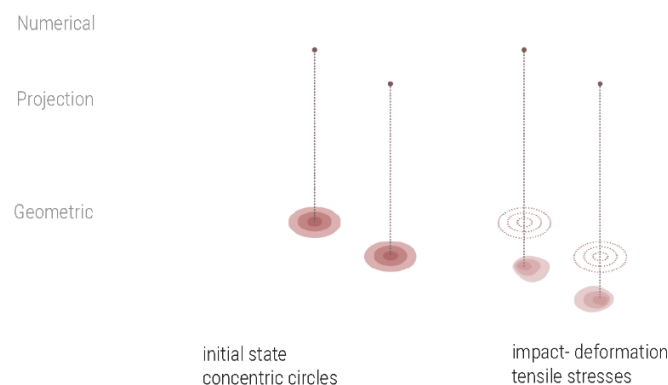


Fig. 4. Diagram presenting the deformation of the initial range of influence

The new, processed spatial footprint of the resources produces discrete densities and dilutions of the mix of endogenous site features recorded earlier. The mix of different resources highlights the multidimensional identity of the place. The identification of the densities indicates the coexistence of separate spatial units within the study area. The appropriate delineation of the resulting units forms the basis for the continuation of the method being developed (Fig. 5).

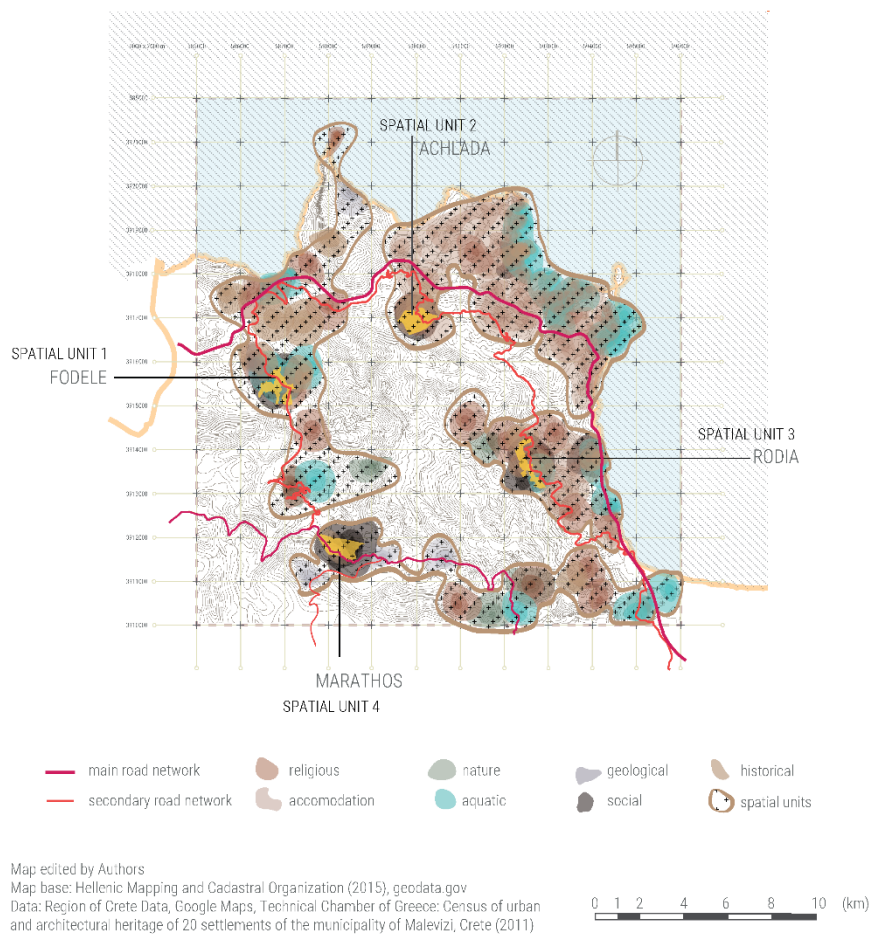


Fig. 5. The spatial units identified in the area

Despite the multitude of different categories of resources found in each unit, some seem to predominate either quantitatively or qualitatively, revealing a unit's identity. The so-called 'identity' of a spatial unit indicates the main axis on which its activation initiatives will be based on. The scope of influence of the resources enclosed within a

unit determines their qualitative advantage over other resources. As the scale of identification of the place becomes larger, the mix of endogenous resources is inducted into four levels in order to simplify the process. The classification operates by condensing the original categories that were defined. The levels are: culture, natural environment, economy and administration. The identity of the spatial units is classified on the basis of these new axes.

The ultimate goal of economic and social revitalization of the study area can be divided into the activation of each distinct spatial unit created. An action plan for each spatial unit shall be formed, and it should be based on the identified potential of the endogenous resources. Every predominant level out of the four, either tangible or intangible, constitutes the comparative advantage of each spatial unit. The action plan also incorporates strategic tools to overcome the obstacles observed and utilize the opportunities appearing due to extraneous trends.

The action plan proposed in the study area aims to reverse the trends that have led to the depopulation or the degradation of the rural area. Within the spectrum of these trends, the action plan could incorporate plans coming from institutional bodies and international, national, regional and municipal administration [6], “bottom-up” actions initiated from associations, cooperatives, collectives and the professional expertise. Most importantly, the driving force behind the activation of each spatial unit is its human capital, that uses it and initiates actions that revolve around its resources.

As stated above, the driving force behind each spatial unit is its human capital. It is therefore necessary to define the users’ profile in order to identify activities that correspond to the interests of these users. The direction of these activities corresponds with the identity of the spatial unit determined above.

The users of the space belong to diverse groups and can be classified into subcategories based on the time frame of their stay in the spatial unit. Categories of users with a long-term, medium-term or short-term stay are foreseen, i.e., locals, new residents, visitors etc. The activity scenarios to be integrated into the site should focus on attracting permanent and semi-permanent residents or temporal visitors at different times of the year so that the spatial units remain lively throughout the year (365-day approach), in a balanced manner.

Concluding, during the “spatial unit formation” stage that is described above, the endogenous resources of the study area are recorded and classified into categories of qualitative and spatial characteristics, which then form cognitive networks of similar resources. In this way, the multi-layered richness of the area and its potential are highlighted, and the direction to which sustainable activities can be developed is identified. Taking the spatial footprint of the mix of resources as a starting point, spatial units are created and their identity is determined. This identity defines the main axis of activities and the users’ profile for the corresponding unit. The next stage focuses on each spatial unit individually, mainly on identifying means of activation based on its special characteristics. The tools of endogenous resources, external trends, networks, spatial units and users, are repeated and adapted to the needs of each scale.

In the study area described, four spatial units were identified and named after the settlements they enclose. These are the spatial units of Fodele, Achlada, Rodia and

Marathos. Each one's identity, based on the comparative advantages it has, falls into one of the four categories. The research continues with the spatial unit of Fodele.

4 Stage 2: Spatial Subunit

The spatial unit of Fodele has been created predominantly by the concentration of natural and cultural resources. It was chosen as a case study as it differs from the other units because the primary sector is still of a major importance (Fig. 6). It is in a transitional phase, as on the one hand roughly one third of its population [7] is still engaged with agricultural activities, on the other hand preoccupation with touristic activities gradually gains popularity amongst locals. Nevertheless, any spatial unit could be approached in a similar way.

Fodele is a settlement located in Crete, with a rich agricultural ecosystem, - especially orange groves - nourished by the Pantomatrís River, but also naturalistic points of interest that extend from the mountainous part all the way to the sea. Fodele represents a typical example of a unit, which economy was primarily based on the primary and secondary sectors, but as mentioned today it is transitioning towards the tourism sector. The transition gets mainly represented by hotel units on the coastal part, airbnb within the settlement, retail stores and restaurants (taverna, cafe) addressing tourists and visitors. The settlement's most important landmarks are El Greco museum and the Monastery of St. Panteleimon (cultural) and Fodele Park (natural).

In winter, as recorded during interviews with locals, the settlement becomes desolated as residents move to urban centres, while the ones who stay have to commute frequently in order to access basic services such as supplies, education and leisure activities.

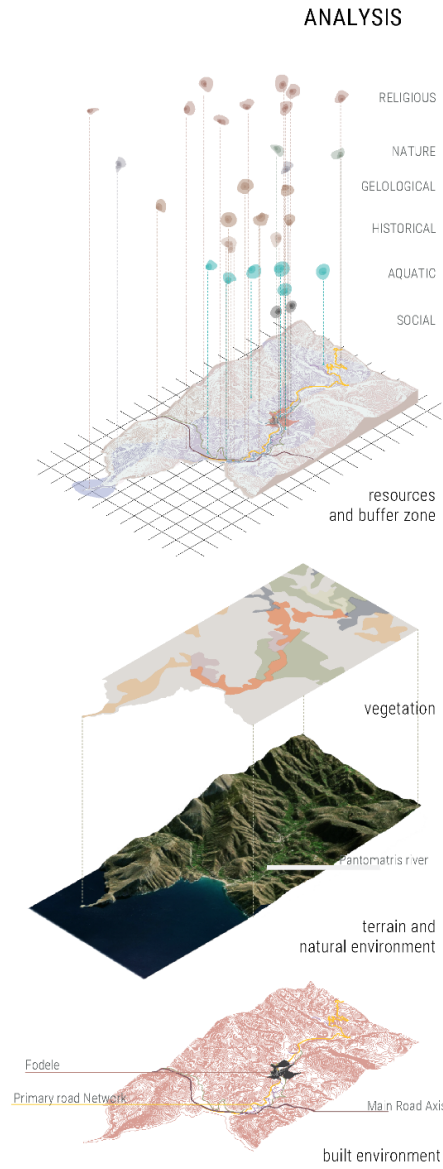
Access to the settlement is provided by the Northern Highway of Crete and the local road network. Visiting neighboring cities and settlements today requires the exclusive use of private cars. The coastal section, and river's mouth, has been extensively deployed, as a hotel complex has completely appropriated the beach and the habitat.

4.1 The Procedure

In the Fodele spatial unit, the repetition of the proposed procedure (the generation of the spatial units by mapping resources) creates new spatial sub-units. Each sub-unit is evaluated according to the category it belongs to (culture, natural environment, economy, administration). The numerical superiority of concentrated resources of similar type inherits its identity to the newly formed spatial subunits. In this way, the goal of activating the whole unit of Fodele is distributed over the gradual activation of the individual subunits. When the majority of the subunits is activated, the whole spatial unit also is.

In consecutive successive focuses carried out on the site, the endogenous resources are enriched in accordance with the cartographic scale. With the enlargement of the

map scale resources of local range are being added that could not be recorded at smaller scales, highlighting new spatial and social qualities.



Maps edited by Authors
Map base: Hellenic Mapping and Cadastral Organization (2015), geodata.gov, Google Maps
Data: Corine Land Cover 2000, psiloritisgeopark.gr, General Urban Plan of Malevizi Municipality (Phase A), Technical Chamber of Greece: Census of urban and architectural heritage of 20 settlements of the municipality of Malevizi, Crete (2011)

Fig. 6. Attraction of appropriate that defined Fodele's identity

Up until this point, the resources could be mapped and identified by off-situ research. This particular stage requires mapping of endogenous resources in-situ, as the resources may have not been significant enough to be recorded officially. These resources are of local importance and influence. This case study includes archaeological, folklore, naturalistic, religious and geological sites. Many are retrieved by oral history and spatial fragments, such as old paths and routes, abandoned or disdained buildings and abstract landscape formations. Non-existing resources were integrated as well, for they are plans for new buildings or uses of local administration.

What becomes apparent at this point is that endogenous resources differ, not only in terms of type, but also in terms of significance. New criteria arise as some resources prove to be crucial for the survival and daily life of the local population, while others attract residents and visitors for a number of reasons (recreation, interest, promotion), and some are in complete disuse.

It's also important to highlight the complex correlation between the endogenous resources and the attracted users. Specifically, each resource category attracts certain groups of users, and different resources attract users and activities for different durations and with varying intensity. For example, the annual Orange Festival organized by the cultural association (social resource) in the settlement attracts a large number of visitors for one night (short-term use, users: visitors, and residents), while the El Greco Museum attracts short-term visitors mainly in the summer months. Also, the abandoned laundry-building attracts no one, -although it was once the major meeting place for the women of the settlement-and the prospective sports center will attract the local population (residents) for almost daily use.

The aforementioned examples relate the factor of time to the scope of influence and use of each resource. Some resources have been important in the past, but not anymore, while others are expected to become an area of interest in the future. Therefore, assessing the status of the resources, according to their importance to specific user groups, is considered a necessary process for the activation of the spatial unit. Points of interest that attract user groups actively and on a recurring basis are categorized as active resources, (Fig. 7) while resources in a dilapidated state that are unable to attract interest at the present time are classified as inactive. Finally, resources that are valuable to some user groups but inaccessible or underutilized are classified as dormant resources. By reversing or leveraging the current state of endogenous resources, and with the driving force being stakeholders, who are also active, dormant or inactive, a dynamic way of approaching a spatial unit emerges.

As discussed, the activation of the entire spatial unit requires the activation of each spatial subunit and most importantly a strong connection between them. To achieve the first condition, the utilization of active resources is chosen. However, not all spatial subunits have active resources. In this case, it is proposed to strategically utilize dormant or even inactive resources in a way that leverages the endogenous characteristics of the site. In order to achieve the second condition, complementary uses between the spatial sub-units are needed to establish self-sufficient and sustainable spatial units. Architectural interventions are critical for resources' activation, including re-use or repurposing of existing buildings or open-spaces, restoration and place-specific design.

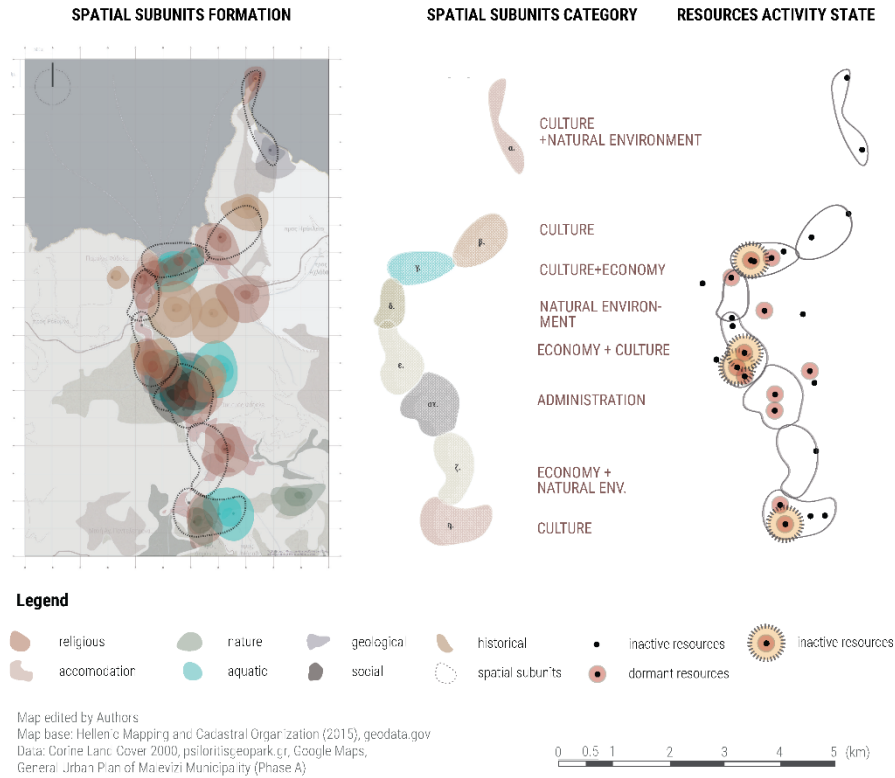


Fig. 7. The sub-units of Fodele spatial unit and resources classification

In addition, the resources should be easily accessible by various means and in close proximity to residential areas in order to be utilized. Thus, accessibility and interconnection between the resources is recognized as being of utmost importance. Subsequently, the creation of primary and secondary connections is prioritized and the key design gesture is to highlight existing active resources and redesign inactive ones.

Summarizing, the methodological stage of "Fodele Spatial Unit" described above, begins with identifying spatial sub-units and their identity, which falls within the four categories specified in the previous stage. More endogenous resources are then detected based on new methods of in situ mapping and qualitative assessment, which are classified as active, dormant or inactive. Ultimately, the aim is to activate all resources in each sub-unit individually and link them together. Architectural design, repurposing of points and accessibility are highlighted as key factors in utilizing the endogenous characteristics of the site and therefore the route is defined as a key tool in the planning method presented.

5 Stage 3: The Route as a Key Tool

5.1 Case study

In the next stage of this methodology, focus turns to achieving the promotion and accessibility of the resources of each subunit both individually and as a whole. As mentioned, the design of the unit is place-specific, thus the existing spatial patterns should be mapped, in order to adapt to the place's unique qualities. What emerges at this stage, are points of interest and routes that can be utilized to spatially activate the subunit's resources. The activation requires accessibility which shall be based on existing paths and road networks or follow the traces of the historic ones. A network of single pathways, running through active resources, picking up new complementary uses (by restoring and repurposing existing resources) and addressing to a diverse group of users may contribute to unify the spatial unit. In this way, the existing trace of the paths is redefined and activated.

In the Fodele spatial unit, the subunits selected to be studied, reveal points that are identified as strategic parts for intervention. These are path intersections, i.e., hubs; path and street intersections, i.e., entrances to the route; and plazas, resources and other spatial forms, i.e., stops.

In the research carried out in the spatial subunit of the Museum, where the endogenous resource of the El Greco Museum (culture) and the church of Virgin Mary (culture) are located, there are dirt roads that were formerly used by the locals, and others that are currently used by farmers. Thus, this subunit whose identity category is culture, acts as a pole for visitors. In the adjoining spatial unit of the riverbed, no active resources are found, only cultivated areas of oranges, olive trees and greenhouses. Due to these endogenous characteristics, in this subunit, the focus of interest is on the primary and secondary sector. Existing abandoned greenhouses (inactive resources) are being restored and taking on agritourism uses (identity category: economy), which can be accessed via the central riverside route of a cultural character (see Museum pole), making use of the existing agricultural paths, and the rest strategic parts of intervention. Thus, an agritourism centre is proposed, which could be a new active resource, utilizing existing inactive assets, consistent with the identity of the sub-unit. The pathway that runs across all subunits, makes the new use accessible by foot, and the proximity to the settlement (proximity to accommodation) increases the potential of activating the resource. Finally, it appeals to people who use the site for different periods of time and purposes. Short-term; visitors and travelers; Mid-term; agricultural specialists, interns, agritourism, Long-term; local farmers, workers specialized in the operation of the centre, professionals etc.

In other districts, plateaus are proposed as recreation and rest areas. Inside the settlement a redesign of the public space and an info kiosk pointing the entrance to the riverside path -and welcoming the visitors- are proposed.

6 Discussion and Conclusions

The research described in this paper proves that systematic analysis and interpretative mapping of the rural space is a necessary tool for its redefinition and revitalization. Implicit characteristics are very important, in order to define a specific area's (spatial unit's) identity in an algorithmic manner. These characteristics involve endogenous resources and geomorphological features of a selected space.

However, the sole recording and analysis of endogenous resources cannot effectively achieve the goal of understanding and defining the identity of a place. It is essential to associate the data with qualitative characteristics. These are the place itself, memory, history, culture, tradition and context (time, external factors). This explains why certain resources tend to be concentrated or diluted, tend to influence more or less than other resources, and ultimately tend to be recognized and protected or destroyed. The identification of interconnections, between resources, outlines distinct spatial units with a unique identity.

Social resources are key for the revitalization of a place. Human resources act as an activating force for the operation of each spatial unit. Without people (local and new residents) and their activities, the place desolates, as well as every precious characteristic attributed to it. Planning for people, especially locals, and in collaboration with them, can prevent the trend of rural abandonment.

Another key component of the methodology described, is mapping resources in successive scales. The analysis that was formed in the smaller scale is used as feedback for the next one. By enlarging the scale, the records are enriched. For larger scales, in-situ research is indispensable. Specifically, experiencing and observing the place, as well as interacting with and interviewing residents of different social groups and stakeholders, helps to recognize and record new resources that are inactive or in dormant state, thus could not have been recorded in previous scales.

Finally, determining the users of the rural space specifies the directions of the strategic planning. Time poses an important factor in this process. As mentioned, an influx of users visiting a place for a limited period of time, tends to over-activate specific resources of this place for the aforementioned period. In contrast, when those seasonal users leave, the resources tend to deactivate. Hence, users living in the area for different lengths of time should be addressed. Simultaneously, a high demand from one group of users and for specific resources, leads to monopolization of uses, thus partial activation just for those particular resources. This leads to gradual degradation of some resources, and failure to address other groups of users. A sustainable planning approach should be inclusive and address to a multitude of users, of diverse background and occupation, and for various durations of using the place.

Choosing Crete, especially a degraded and understudied part of it in Northern Heraklion, provided a prolific ground for this methodology to flourish. Focusing in the Fodele spatial unit as a pilot study, also allowed the methodology to enrich. Researching more places using this methodology could possibly point out more factors, as planning directions are site-specific, not mass and homogenized, respectful of places unique identity and citizen's culture, needs and way of life.

Using the described methodology, a brief diagram of which is presented in Fig. 8, Fodele's case study resulted mainly in the formation of a riverside pathway and the (re)design of activation points along this axis. The path turned out to be the main design tool for the strategic management and planning of the spatial units, in order to create access to existing and new endogenous resources, and their activation, for the specific needs of a diverse range of users.

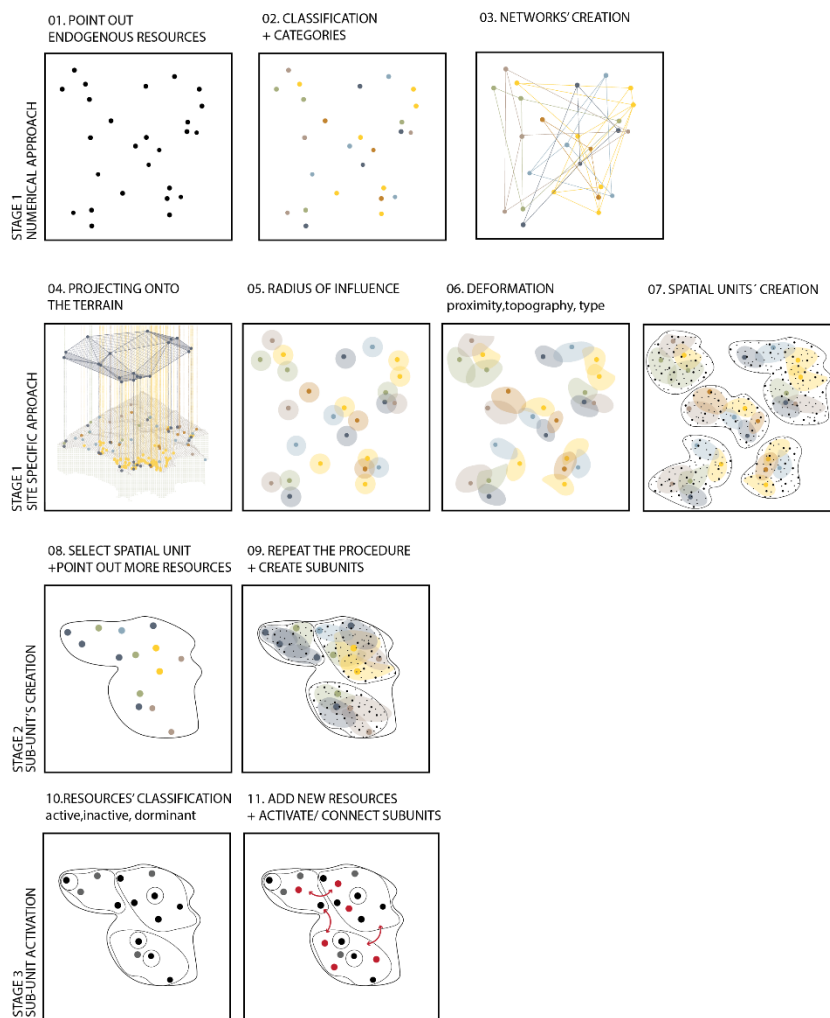


Fig. 8. Explanatory diagram briefly showcasing the consecutive stages of the methodology

The research proves that a comprehensive analysis of rural space and the determination of the appropriate plan to redefine and re-activate it, is a complex, multifaceted procedure that involves dynamic factors. Nevertheless, its importance and necessity are

indisputable, especially when it comes to respecting and protecting the culture, the nature, the unique physiognomy of the place, while at the same time addressing contemporary needs. Finally, the adaptation of this strategic planning to the intrinsic characteristics and comparative advantages of a place, can shape a sustainable, culturally rich future of traditional rural settlements that are bound to be degraded irreversibly.

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