

A COMPARATIVE ANALYSIS OF SUSTAINABLE MANAGEMENT STRATEGIES FOR THE CONSERVATION OF VERNACULAR SETTLEMENTS

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Resume:

The present paper aims to compare management strategies for the sustainable conservation of rural settlements and vernacular architecture. It addresses the difficulties that arise when analyzing this type of heritage and discusses the considerations that must be taken into account for its proper management. The process of management itself can be complex, as it requires understanding the social, cultural, environmental and economic features of each site. The present article seeks to compare selected case studies in which sustainable management strategies have been considered for the conservation of rural settlements with an important vernacular heritage. The comparative analysis presented, identifies common strategies that can be replicated in sites with similar characteristics. The paper also provides a reflection and analysis on the potential of implementing these approaches in the conservation and management of the natural and cultural heritage of the Montesinho Natural Park, in Portugal.

1 INTRODUCTION

Vernacular settlements are a result of the communities' socio-economic interactions with the land and its natural conditions, forming a living cultural heritage. The local expressions and people's identities are revealed through the evidence of their social engagements, economic production, and the architectural constructions they build. However, obsolescence and abandonment pose serious problems to these settlements. Because of a fast-developing modern society, these settlements are facing distinct threats that jeopardize their existence, namely: losing ancestral knowledge, abandonment of the territory and disaster risks because of climate change. These threats not only entail the material loss of the tangible values of the territory but also its most intangible ones, as their values are not only related to the natural and built environment but also to the tradition, spirit and feeling of the place [1].

Nowadays, the current consumption model has put in risk the sustainability of the planet. The United Nations Environment Programme has called the 2022 Emission Gap report "climate crisis calls for a rapid transformation of societies" [2]. The study of vernacular settlements is becoming more vital in the present times, as they can help to overcome the contemporary challenges associate to climate change. They are a reminder that humankind can develop their economic activities sustainably. Not surprisingly, UNESCO has identified the rehabilitation of vernacular settlements as an activity that can contribute to 9 of the 17 sustainable development goals proposed for the 2030 Agenda for sustainable development [3].

Implementing management strategies that facilitate the rehabilitation of vernacular settlements is a crucial way to maintain an environmentally conscious production capacity without compromising the planet's habitability

2 SUSTAINABLE HERITAGE MANAGEMENT

The concept of sustainability is related to the capacity of a system for being maintained over time without compromising the resources of the future generations [4]. The process of management in heritage is conceived as a mechanism to guide change in the cultural heritage while retaining the most significant values [5]. It involves the participation of the different actors that take part in the management process, such as scientific, technical, political, financial, and the community inhabitants.

By putting these two concepts together, Sustainable Heritage Management can be related to the actions necessary to adapt the Cultural Heritage to the modern needs of society, while retaining its cultural significance. The strategies adopted for the transformation of the Cultural Heritage must generate an economically profitable process that improves the living conditions of its inhabitants while being respectful with the environment. This can be a complex process, as it involves the participation of many actors with different interests.

3 DIFFICULTIES OF MANAGING VERNACULAR HERITAGE

Formulating effective management strategies of vernacular settlements needs a comprehensive and integrated approach that maintains a balance between conservation, development, stakeholder engagement, sustainability, and adaptability to changing conditions. The following outlines some of the difficulties encountered in this process and propose solutions to address them.

3.1 Definition of Vernacular

One of the first issues that arises when approaching the study of vernacular architecture is its own definition [6]. ICOMOS has defined vernacular architecture as:

“... the traditional and natural way by which communities house themselves. It is a continuing process including necessary changes and continuous adaptation as a response to social and environmental constraints [7].”

According to this definition, vernacular architecture is the results of a dynamic and evolving process, shaped by the needs of those who inhabit it, rather than a static product. This position has made some scholars to argue that the use of modern materials in vernacular constructions is a natural response to this dynamic process, so its use does not compromise the significance value of a settlement as long as the intangible values of the community are preserved [8,9]. Some others suggest that the use of this type of materials an authenticity loss of the vernacular character, hence, recommend not to use them [10]. In the Encyclopedia of Vernacular Architecture of the world, Oliver states that these two concepts must be separated, and refers that some authors make use of the term neo-vernacular to refer to the modern expressions of the vernacular [11].

Although these perspectives may be difficult to understand theoretically, from the management standpoint these are better handled by understanding the significance of the vernacular architecture such as the historical layers, the constructive traditions associated and the socio-economic dynamics of the settlement. This allows to recognize the values of the site and to identify its significance in relation to the natural processes of the community.

3.2 Understanding the site's intangible values

A vernacular settlement must be understood in relation to its natural environment and the socio-economic activities of the community. Nature provides the materials for building the houses and the means of subsistence in terms of agricultural and livestock production: The social interaction of the communities shapes the configuration of the villages setting, creating a link between the socio-economic activities of the people with the ecological properties of the environment. This constant interaction with the environment also creates unique associations to the territory that are manifested through cultural activities like celebrations, gastronomy, spiritual bonds, etc., that have an own understanding only by the inhabitants themselves. It is these interactions that give the settlements their own identity, hence they must be understood as a group of connected elements, not as isolated building units.

One of the most important aspects in a management program should be to recover this dynamic relationship between the inhabitants and their territory. Someone from outside the community may find it challenging to understand the values of this economic, social, and environmental relationship, yet is something intrinsic for those who inhabit it. This explains why communities are increasingly being given an important role in the whole management development process, as they are the most important stakeholders during the strategy implementation phase.

3.3 Depopulation

At present, desertification and abandonment of vernacular settlements is a normal process; it is very difficult to persuade people to move or to stay in rural areas [12].

Depopulation is commonly caused by economic factors, such as the low rentability of traditional agricultural production or employment opportunities being scarce. While some rural areas have managed to adapt to contemporary needs -like tourism- or adopt modern systems of agriculture, some are completely in ruins as a result of a progressive abandonment [13]. This impacts negatively the social relationships within the community, and results in losing of their cultural and social values.

To generate sustainable solutions and promote the regeneration of vernacular settlements, a holistic management strategy must be implemented by jointing the efforts of the different stakeholders: local communities, government organizations, NGO, and private companies.

3.4 Standards of comfort

Comfort has become increasingly important in twenty-first century society, leading to the opinion that anything which is out of date is no longer useful. This applies to vernacular settlements, which are usually perceived as obsolete places because the living standards do not meet modern standards of quality. At the local level, this arises from the deficiency of availability to public transportation, hospitals, grocery stores, entertainment activities, etc. At the building level, this includes absence of electricity, small living areas, accessibility issues, lack of thermal comfort and luxurious items, and so on. Therefore, vernacular settlements experience several issues of obsolescence and degradation.

Generally, the solution adopted by the inhabitants to this problematic is to abandon the village or to introduce alterations in the buildings that compromise the authenticity and integrity of the villages, thus, the settlements heritage values. Adjusting to modern standards of comfort is one of the biggest challenges faced by vernacular settlements. Management strategies can be put forward to direct the transformation required to enhance the lifestyle of the people, without compromising the heritage values of properties and settlement.

3.5 Assessing heritage values

A fundamental aspect of heritage management is establishing the site's values. They are formulated by a multidisciplinary team and with the cooperation of the different stakeholders involved in the management process. These values can be subjective and difficult to assess, as different perspectives and interests are introduced by the different stakeholder that takes part in this formulation process. Therefore, it is important to understand the expectations and aspirations from the different actors, so this multiple vision can be addressed when formulating the management strategies for the safeguarding of the settlement values.

3.6 Sustainable value

Many specialists acknowledge the natural sustainable value of vernacular settlements [14-16]. These are manifested through their adaptation to the climatic conditions of the environment, the use of naturally available materials, low CO2 emission produced, etc. It has been noticed that the settlements setting considers the geomorphological properties of the surrounding environment to improve the climate adaptation of the villages. To highlight this value, Guillaud proposes to adopt a statement of significance for sustainable development [17]. For management purposes, it implies that these values must be considered while assessing a settlement's cultural significance to retain and preserve the sustainability values. The adoption of this statement in the management of vernacular settlements would require the performance of research studies to get a more

comprehensive knowledge of the sustainable capacities of vernacular constructions. This would assist in the conservation of these values, and the acquired knowledge could be employed to address the sustainability problems of modern constructions.

4 MANAGEMENT STRATEGIES

Several management strategies adopted in large natural areas with existing vernacular settlements have already been proposed throughout the world. The present section identifies and analyzes three management plans implemented in the Iberian Peninsula that are part of the network of protected areas in Spain and Portugal. The existing settlements are found within mountainous landscapes, displaying the existing connection between man and nature.

4.1 Use and management plan of the *Picos de Europa* national park

The *Picos de Europa* National Park is located in the Northwest of Spain. The area is an exponent of the traditional culture linked to shepherding. Human activity shaped the landscape man activity in the form of sheepfolds (groups of huts) and meadows. Man's interaction is also evidenced in the abundance of domestic animals (cows, goats and sheep) that make up the rich local livestock and the basis for the production of the highly appreciated local cheeses [18]. The natural characteristics of the park qualified it to be designated as UNESCO Biosphere reserve in 2003[19].

The park's management principal objective is the maintenance of the integrity of its landscape [20]. Management strategies are guided by the criteria of minimal intervention, primarily aiming at: (i) preservation of natural values and landscape; (ii) restoration of natural ecosystem; (iii) preservation of cultural values, intangible heritage and traditional activities and uses associated with the area; and (iv) ensuring safety or repair of infrastructure.

More specifically, the management strategies should guide:

- Adaptation of the territory to climate change and its mitigation.
- Safeguarding the territory from pollutants.
- Environmental education.
- Conservation of ecological diversity.
- Promotion of traditional activities.
- Conservation of the landscape and cultural heritage.
- Support socio-economic growth.
- Formulation of public-use policies.
- Promotion of scientific activities.
- Creation of guidelines for monitoring, evaluation, and control.

4.2 Co-management plan of the *Peneda-Gerês* national park

The *Peneda-Gerês* national park is located in the northwest of Portugal, bordering Spain. It is the only national park in Portugal. It holds a wealth of historical and cultural heritage that includes megalithic necropolis, traces of Romanization and castles. Many vernacular settlements remain in a well-preserved condition. The landscape is characterized by different man-made constructions that have been built to withstand the challenges of mountainous regions. These structures (wolf traps, granaries, mills, communal ovens, canals, pavements, and shepherds' shelters) reflect the collective

mentality of the inhabitants in the past. This collective sense is still present today and is manifested through agricultural activities related to farming and livestock breeding [21].

The park's management strategies focus on three key objectives: enhancing the value of the region, fostering socio-economic development and protecting nature [22]. Through the involvement of the community, the aim is to generate more value and potential in the region, thus instituting a collaborative and participative management system. The following are the strategies applied to the territory management:

- Communicating and promoting the park's territory.
- Dissemination and sensitization of the park's natural and cultural values.
- Raising awareness and promoting training to accomplish the 2030 objectives of sustainable development.
- Encouraging sustainable economic activities, traditional products elaboration, and entrepreneurship by incorporating technological, economic and social innovations.
- Enhancing the village's values and promoting social development.
- Regenerate the settlements.
- Recovery and conservation of the cultural and natural heritage.
- Promote efficient resource management
- Resilience and protection of natural habitats.

4.3 Alto Douro Wine Region

The Alto Douro Wine Region is inscribed on the UNESCO World Heritage List [23]. It is a representative area of the landscape that characterizes the Douro Region, the oldest regulated wine region in the world. The Alto Douro region brings together the natural environment of the Douro River Valley and the ongoing influence of humankind, altering the area to meet the Mediterranean-style agricultural requirements of the region. The land topography has been used in an exemplary manner, with the landscape being shaped into terraces that prevent erosion and facilitate the cultivation of vines [24].

The region's management strategies center on the conservation of the landscape values. The management plan identifies the modern landscape affections because of human activities and provides proposals to mitigate and counteract the visual impact. It emphasizes the safeguarding of the elements that are of utmost importance to the landscape's formation, such as agricultural production, terrace patterns, vernacular settlements and natural biodiversity. The strategies adopted for the territory management are:

- Land planning and management
- Sustainable agricultural development
- Landscape qualification and enhancement
- Qualification and valorization of the settlements and the built heritage
- Promotion and regeneration of the Territory
- Monitoring the implementation of the Plan strategies

4.4 Comparison analysis

Comparison between management strategies of different sites can lead to the recognition of similar actions. These can be divided into different categories based on their scope of application. The following categories are suggested for its classification: (1) nature conservation; (2) landscape conservation; (3) culture conservation; (4) socio-economic development; (5) external networking; (6) promotion; and (7) monitoring.

Table 1 shows a comparison of the management strategies from the different parks that have been grouped into these categories.

Comparing the different sites' management strategies highlights the key features each plan was focused on. For example, the management strategies used in the *Picos de Europa* National Park are focused towards the conservation of the natural setting. The *Peneda-Gerês* National Park has a priority of improving the socio-economic development of its inhabitants. The goals of the Douro Wine Region are oriented towards the conservation of the landscape features.

Evaluating this comparison will help to identify any potential shortcomings in certain management processes. In the *Peneda-Gerês* park, the strategies for landscape conservation are not directly emphasized, but still are assessed indirectly through the other categories involved, like nature conservation and culture conservation. There are deficiencies in the promotion strategies of the Douro Wine Region. The inscription of the site in the UNESCO World Heritage List simplifies its recognition around the world, resulting in less effort regarding its promotion. The *Picos de Europa* natural park has implemented a more balanced management approach.

The comparison also reveals a satisfactory balance between the different strategies adopted; they complement each other in the overall management plan.

Table 1. Management strategies of three protected areas with vernacular settlements.

| Site | Nature Conservation | Landscape Conservation | Culture Conservation | Socio-economical development | External involvement | Promotion | Monitoring |
|--------------------------|--|---|--|--|--|---|--|
| <i>Picos de Europa</i> | Adaptation of the territory to climate change and its mitigation | Conservation of the landscape and cultural heritage | Promotion of traditional activities | Support socio-economic growth | Environmental education | Formulation of public-use policies | Creation of guidelines for monitoring, evaluation, and control |
| | Safeguarding the territory from pollutants | | | | | Promotion of scientific activities | |
| | Conservation of ecological diversity | | | | | | |
| <i>Peneda-Gerês</i> | Promote efficient resource management | | Recovery and conservation of the cultural and natural heritage | Encouraging sustainable economic activities and traditional products elaboration | Raising awareness to accomplish the 2030 objectives of sustainable development | Communicating and promoting the park's territory | |
| | Resilience and protection of natural habitats | | | Enhancing the village's values and promoting social development. | | Dissemination and sensitization of the park's natural and cultural values | |
| | | | | Regenerate the settlements. | | | |
| Douro Wine Region | Land planning and management | Landscape qualification and enhancement | Qualification and valorization of the settlements and the built heritage | Sustainable agricultural development | | Promotion and regeneration of the Territory | Monitoring the implementation of the Plan strategies |

5 CASE STUDY: MONTESINHO NATURAL PARK

5.1 Description

The *Montesinho* Natural Park (MNP) encompasses the northern region of Portugal. The park is bordered to the north and east by Spain and covers an area of 750 km² with approximately 8,000 occupants inhabiting 88 different villages. It hosts many important species of flora and fauna. The park's geomorphology is composed of gentle reliefs, with valleys dispersed throughout the mountainous area. Wise utilization of the terrain's geomorphology has resulted in a specific vernacular architectural heritage. These structures are mainly composed of rural dwellings and small buildings which were used in agricultural and livestock activities. The villages in the park were shaped by the

subsistence activities that were practiced in the past. These activities arose from the community's collaborative culture and the collective use of resources like ovens, presses, mills, forges, dovecotes and lime kilns.

The environment of the park favors the growth of chestnut trees; chestnuts have been a key source of sustenance for its inhabitants. These trees have a prominent presence within the park and are the most significant natural elements of the park's landscape.

5.2 Strategies formulated

Through the comparative analysis, it is possible to develop management strategies for the conservation of the Montesinho Natural Park (MNP). Having considered the categories previously mentioned and the current state of the park, Table 2 outlines the strategies proposed for the conservation of the park's intrinsic values. The resulting strategies encompass the most important aspects of the site's management and can be used as a preliminary framework for a wider management program.

The analysis of the three case studies also revealed that their management strategies were mainly directed towards the conservation of the landscape, nature, and promoting the socio-cultural aspects of the inhabitants. They are lacking in establishing proper management policies for the conservation of the built heritage. To fill this gap, a specific category is proposed in the overall management strategy for the MNP. This strategy is incorporated in the last column of Table 2.

Table 2. Management Strategies for the Montesinho Natural Park

| Site | Nature Conservation | Landscape Conservation | Culture Conservation | Socio-economical development | External involvement | Promotion | Monitoring | Built Heritage |
|--------------------------------|---|---|---|--|---|--|---|---|
| <i>Montesinho Natural Park</i> | Asses the Impact of climate change | Encourage chestnut traditional production practices | Promote grazing activities | Consolidate the communities relations with the different stakeholders | Promote Sustainable Tourism. Avoid mass tourisms strategies | Dissemination of quality brands linked to the park's production | Easily measurable indicators in monitoring programs | Study of forms, materials and construction techniques |
| | Environmental restoration in areas degraded by human action or natural causes | New projects developed under the criterion of minimum visual impact | Promote native livestock-breeding | Develop agricultural production by incorporating technological, economic and social innovations. | Consolidate a network of hiking routes | Information and dissemination campaigns aimed at gaining international recognition | Implement GIS tools | Recovery of the vernacular heritage |
| | Endangered species management | Intervene unnecessary and abandoned artificial structures | Valuing and promoting intangible heritage | Training activities for the local population on sustainable tourism and responsible use of natural resources | Carrying actions for the environmental education of visitors | Promote the dissemination and knowledge of the park's natural and cultural values | Inventory and monitoring of natural values | Define standards for new implantations and buildings |
| | Maintenance of natural vegetation areas | Valorize the geological and geomorphological heritage | | Promotion of local arts and handicrafts elaboration. Commercialization of local products | Promote collaborative research activities within the park through scientific entities | | | |
| | Control of invasive introduced species | Adapt existing infrastructure to the Park's traditional typologies | | Improve living quality of the populations. Encourage their permanence and dignity | Construction of infrastructure and collective equipments. Enhance the general public visit experience | | | |

6 CONCLUSIONS

At present, the tangible and intangible values of vernacular settlements are being threatened by mischaracterization and abandonment. A proper management strategy can

offer solutions to face contemporary challenges of vernacular heritage, by guiding their transformation while retaining its most intrinsic values. Defining a strategy can be complex, as it requires a multiple perspective to comprehend the dynamic processes of these settlements.

A comparative analysis of the management strategies employed at various protected sites with vernacular settlements was conducted. The results highlighted the categories on which management strategies are prioritized on each site. This analysis can be used to detect any deficiencies in the management approach, so its application at the initial stage of management could assist in the enhancement of the strategies required to manage change at vernacular settlements. The analysis also highlighted the need to improve the strategies necessary to enhance the vernacular heritage of large natural areas.

Comparable management strategies can be observed at sites with similar characteristics containing vernacular settlements. Both national parks and UNESCO sites, although different in complexity, share considerable similarities in their management plans. The detailed study of the UNESCO site is what makes it distinct from the analyzed natural parks; this results in proposals that prioritize the protection of the World Heritage site most important values.

The application of management strategies from other sites, akin to the Montesinho Natural Park, enabled the acquisition of primary assessments that serve as a guide for the formulation of specific comprehensive strategies. These strategies should be addressed to the specificities of the site's vernacular settlements.

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