
Guest editorial: Vernacular architecture: sustainability and risks

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All over the world, vernacular architecture is characteristically the result of centuries of trial and error using locally available materials. It is the cumulative result of many years of experience, providing optimal solutions for individual locations with specific climate, resources and conditioning factors. As these traditional techniques and materials often require little transformation and given that the almost untouched raw materials are obtained locally, the resulting vernacular architecture can be said to have struck a balance with the environment, blending in with ease. Equally, this architecture is the result of collective participation and collaboration from local inhabitants, whose identity is thus reflected in material culture. For the most part, these buildings are magnificent examples of environmental, socio-economic and socio-cultural sustainability as currently understood. The lessons to be learnt from this vernacular architecture for the design of a more sustainable and resilient vernacular architecture have been and continue to be researched in European programmes, such as VerSus – Vernacular Heritage for Sustainable Architecture (<https://www.esg.pt/versus/>) and Versus Plus – Heritage for People (<https://versus-people.webs.upv.es>), which is directed by the editors of this special issue.

Vernacular architecture in the 21st century faces different risks and threats: social (abandonment, social discredit, demographic pressure, tourist development [...]), anthropic (carelessness and neglect, lack of protection and maintenance [...]), and natural (floods, landslides, earthquakes, winds, rising temperatures [...]). Furthermore, as vernacular architecture was not designed for these extreme conditions, current climate change intensifies some of these natural threats. However, there is still much to be learnt from vernacular architecture, which represents the identity of the peoples who built it and still preserves some of the best examples of sustainability and resilience ever seen. Its conservation is an unavoidable and pressing task.

The special issue *Vernacular architecture: sustainability and risks* presents a selection of six articles based on the ideas submitted by authors to the *HERITAGE2020 International Conference on Vernacular Architecture in World Heritage Sites, Risks and New Technologies*. These contributions are specifically linked to two of the general topics analysed at the conference: the study of vernacular architecture from the perspective of sustainability and the assessment of the risks which threaten this cultural heritage. The articles presented in this issue focus on two topics – the selected case studies and the specific topics they examine – and have been chosen as the most representative sample possible from this wide-ranging international conference.

As regards the first topic, all the articles in this special issue focus on the subject of built cultural heritage and traditional know-how, mainly concentrating on building culture. Within this culture, there are different representations: vernacular heritage, World Heritage, earthen architecture and archaeological sites. As these are not rigid categories, this issue includes cases which fall within several of these. Thus, the articles by Asencio, López-Orsorio and Rosa, by Dipasquale, Montoni, Montacchini and Mecca, and by Songel examine case studies or knowledge of vernacular architecture. The first of these articles focuses specifically on an example of earthen vernacular built heritage while the second concentrates on studying this case from the point of view of World Heritage. The articles by Caballero, Viñals and Tormo,



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and Nakhaei and Correia list the effects of climate change on two archaeological sites. Moreover, the earthen archaeological site examined by Nakhaei and Correia is also a World Heritage Site. Finally, together with the specific case study of Asencio, López-Orsorio and Rosa, the article by Mileto and Vegas provides an in-depth review of the values and strategies of the conservation of earthen architecture in general.

As regards the second topic, the issues studied revolve around the two concepts guiding this special issue: sustainability and risk. Sustainability is linked to the study and recovery of traditional knowledge and to the conservation of cultural heritage as an essential tool for combatting the effects of climate change (texts by Asencio, López-Orsorio and Rosa; Nakhaei and Correia, Dipasquale, Montoni, Montacchini and Mecca, Songel, Mileto and Vegas). Risks are examined from the perspective of the vulnerability and fragility of vernacular heritage as well as from that of its resilience and capacity for adaptation (Asencio, López-Orsorio and Rosa; Caballero, Viñals and Tormo; Nakhaei and Correia; Dipasquale, Montoni, Montacchini and Mecca). A common thread in all these articles is the need for the conservation and management of heritage facing a future panorama dominated by climate change.

Caballero, Viñals and Tormo analyse the archaeological remains of the Roman *piscinae* in several parts of the western Mediterranean basin (Spain, France and Italy). The most striking aspect of this study is the interpretation of heritage as a tool for studying variations in sea level, that is, as an indicator for the effects of climate change. Research on locations meeting the requirements for this type of assessment is also a wake-up call about their state of conservation and an initial step in documenting and cataloguing this underwater heritage.

As stated, the article by Nakhaei and Correia also focuses on an archaeological site, Tchogha Zanbil in Iran. This case is particularly important as it is an earthen archaeological site, listed as World Heritage and highly exposed to extreme climate conditions. The authors have used this case to illustrate the assessment of the vulnerability of earthen architecture to the adverse effects of climate change. Despite the fact that the physical parameters of exposure and sensitivity do indeed endanger the conservation of the site, an assessment of the capacity for adaptation identified in ancient construction systems demonstrates their great resilience. Thus, future plans for adaptation to climate change and for the conservation and management of earthen heritage must be based on both scientific and traditional knowledge.

The next two articles also examine the theme of the assessment of the risk to vernacular earthen heritage in one case and World Heritage in the other.

Asencio, López-Orsorio and Rosa focus on the study of the dynamics of the environmental, social and economic transformation endangering the Aït Mraou oasis in the Mgoun Valley of the High Atlas (Morocco). This article showcases earthen vernacular heritage as an integral part of a cultural landscape defined by social structures, water management and types of land use. The research evaluates the changes which are affecting these three aspects and which are caused by natural factors, such as periodic floods and depletion of water deposits, as well as by anthropic factors linked to changes in ways of life, construction and occupation of the territory. The authors show how these changes alter the balance of the ecosystem, affecting resilience and threatening heritage values.

As regards the possible risks posed by development plans to heritage conservation, Dipasquale, Montoni, Montacchini and Mecca emphasize the importance of applying a common assessment methodology in order to ascertain the impact of the transformations. This article shows the application of the Heritage Impact Assessment (HIA) methodology developed by ICOMOS in the case study of the Patmos Chora (Greece), also a World Heritage Site. Unlike other current environmental assessment tools, this methodology takes into consideration the multidimensional nature of sustainability and cultural heritage, specifically including the characteristic Outstanding Universal Values (OUVs) of World Heritage cultural sites. In this research, the methodology is applied to a case study on vernacular architecture,

described by the authors as the type of built heritage most sensitive and vulnerable to change. The article warns of the need to find new strategies to protect vernacular architecture, ones able to balance conservation and the need for adaptation. Thus, it is an original approach establishing a correlation between the use of HIA in vernacular architecture and the sustainable management of World Heritage Sites.

Focusing specifically on the sustainability values of vernacular architecture, Songel shows the link between the work of modern architect Frei Otto and the construction solutions of traditional tents and yurts. The article highlights the inspiration taken from vernacular architecture, one born not simply as formal imitation, but arising from a deep understanding and knowledge of structural behaviour, optimization of resources and mechanical limitations of materials. The study shows the acquired knowledge and modern application of traditional solutions based on the assimilation of the logical processes derived from the creation of this form.

Finally, the article by Mileto and Vegas extensively reviews the values of earthen architecture as well as identifying potential threats, drawing up the most advisable conservation strategies from an international perspective. Based on the study of the literature and international documents, the authors have compiled a series of general and specific recommendations. The analysis of the interventions carried out in the selected case studies contrasts theory and practice, identifying examples of application of these recommendations with varying degrees of suitability. All this is of use in proposing conservation strategies that can be applied at local and global level.

All these articles focus on the need to pay attention to the increasingly rapid and intense transformations undergone by society, and in turn, by built heritage. In short, this special issue on the conservation of cultural heritage focuses on the approaches adopted to study the nature of these changes, risk and vulnerability assessment and identifies the capacity for adaptation and sustainability values found in traditional know-how.

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