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# Co-thinking the Language of Vernacular Heritage through a Transdisciplinary Approach: Mapping, Regenerating and Creating

**R. Lorusso[1], A. Mazza[2,*], A. Guida[3]**

[1] University of Campania Luigi Vanvitelli, Naples, Italy and University of Basilicata, Matera, Italy, rosa.lorusso@unibas.it; [2] University of Campania Luigi Vanvitelli, Naples, Italy and University of Basilicata, Matera, Italy, arianna.mazza@unicampania.it; [3] University of Basilicata, Matera, Italy, antonella.guida@unibas.it

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**Abstract**

*The research aims to analyse and valorise the material and immaterial heritage of vernacular architecture, with particular focus on Basilicata and its masserias as emblematic examples of deep-rooted and sustainable building knowledge. Through the mapping of traditional materials (such as raw earth, clay, wood and straw) and the study of construction and decorative elements, the work has developed a transdisciplinary methodology that combines architecture and design to support the creation of new design objects inspired by these elements. This approach interweaves digital innovation with the historical memory of techniques and traditions that define the identity of these places. The process was enriched by a comparison with similar contexts and realities, such as those in Spain, to explore parallels that contribute to a European perspective on the topic. In this vision, masserias, like other examples of vernacular architecture, are considered not only objects of physical restoration but also opportunities to narrate and enhance territorial identity through methodological strategies that combine design and architecture. These processes can activate dynamics of cultural, environmental, social and design sustainability, fostering new opportunities for interaction and promoting wide recognition.*

***Keywords:*** *cultural heritage; traditional materials; digital innovation; vernacular architecture; co-design; transdisciplinary approach*

## 1. Introduction: vernacular architecture as an expression of identity and sustainability

Vernacular architecture constitutes a pivotal element of cultural heritage, embodying local building knowledge, territorial identity, and the principles of building sustainability (Vellinga, 2021). This study explores the potential of Basilicata's masserias, emblematic examples of rural architecture stratified over time, to analyse their material and immaterial aspects and enhance their role in the contemporary context. The research stems from the need to fill a critical gap in studies on Lucanian vernacular heritage, often neglected in the international debate despite its relevance as a model of environmental and socioeconomic adaptation (Oliver, 2006; Mileto et al., 2015).

Through an analysis of construction techniques, traditional materials and the historical context in which these structures evolved, the study aims to

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define a methodology that can be transferred to the design field. The main objective is to demonstrate how vernacular architectural language can inspire contemporary design solutions, bridging tradition and innovation. This approach is part of an increasingly popular global transdisciplinary research trend that combines the hybridisation of architecture and design to combine sustainability and cultural identity (Awan et al., 2011). Experiences like those of the Formafantasma studio or the designer Fernando Laposse, cited here enigmatic cases show how traditional materials can generate new design narratives without renouncing experimentation.

The research questions, particularly, how vernacular heritage knowledge can be translated into operational strategies for sustainable design. How, for example, can the analysis of masserias guide the use of digital technologies for the conservation or creative reworking of these models? How can their technical and cultural heritage contribute to defining innovative objects while rooted in tradition? These questions guide the investigation, which aims to go beyond a purely conservative vision of heritage and instead propose a dynamic reading of it, capable of generating participation and circular innovation.

The research is therefore structured as a theoretical-practical contribution to demonstrate that the recovery of traditional architecture is not an exercise in nostalgia but an active process of regeneration. The synthesis between past and present can respond to our time's environmental and social challenges, provided that an adequate critical contextualisation supports the dialogue between disciplines.

## 2. State of the art: transdisciplinary perspectives in the conservation of vernacular architecture

In recent years, the increasing focus on environmental sustainability and preserving local identities has led to a critical reappraisal of vernacular architecture. No longer regarded as mere evidence of the past, it is now interpreted as a reservoir of technical and cultural solutions capable of responding to contemporary challenges, from energy efficiency to low-impact materials.

The most recent studies, such as those conducted by Correia et al. (2020), emphasise how traditional building techniques - linked to skilful use of local resources and a profound knowledge of the climatic context - still represent current models of environmental adaptation. However, some architectural typologies remain on the margins of academic research despite their recognised potential. This is the case of Lucanian masserias, rural complexes that, while embodying a balance between functionality, territorial identity and sustainability, have not yet received systematic analysis in the international debate.

A comparison with similar European experiences shows how the recovery of vernacular heritage can combine tradition and innovation. In Spain, for example, the reconversion of Valencian barracas-traditional structures made of wood and straw has shown how ancient techniques can be reinterpreted in a contemporary key. Projects like the one the Azalea team developed for the Solar Decathlon (2019) have redefined these buildings through passive solutions and bio-based materials, achieving energy performance comparable to that of modern constructions.

At the same time, a growing dialogue between architecture and design can be observed, resulting in the emergence of collaborative practices. Collectives such as Hypereden (Milan) or researchers such as Spanish architect Irene Roca Moracia demonstrate how the reuse of abandoned structures can generate new spaces and design objects capable of reinterpreting the material identity of places. Based on listening to the context and experimenting, these approaches lay the foundations for a circular regeneration of heritage, in which the past becomes a resource for the future.

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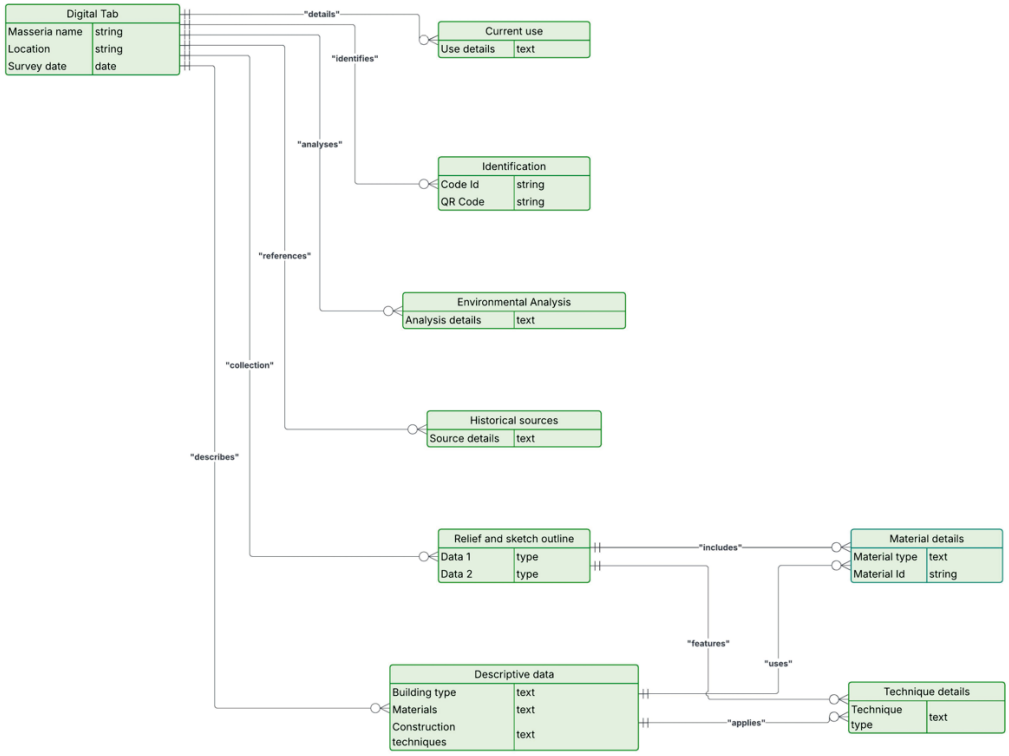


Fig. 1 – *Flowchart structure for the digital card in the mapping phase* (Authors, 2025).

Digitisation plays a key role in transforming architectural documentation from a simple archive into a dynamic design tool. Methodologies such as HBIM (Historic Building Information Modelling) or laser scanning make it possible to preserve accurate data and simulate conservation interventions and assess their impact. Platforms such as Europeana and Google Arts & Culture, moreover, widen the accessibility of heritage, promoting an informed enjoyment of it.

However, as Di Giulio (2024) points out, technology is not an end in itself: its effectiveness depends on its ability to integrate with a critical reflection on buildings' cultural value. It is precisely in this balance—between technological innovation and territorial roots—that the challenge of contemporary conservation lies.

## 3. Methodologies: an integrated approach between material analysis, digitisation and sustainability

### 3.1 Mapping

The methodological approach adopted is based on a transdisciplinary analysis, founded on the principles of Heritage Studies and sustainable design theories, with a particular focus on the interaction between material culture, environmental sustainability and design innovation.

The mapping phase consisted in the detailed mapping of the traditional materials used in the construction of Lucanian masserias, paying particular attention to their environmental impact and link with the historical identity of the area.

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This analysis involved an articulated and stratified data collection: through site visits, materials, construction techniques and architectural details were directly documented; in parallel, an archival and documentary analysis was carried out to reconstruct the historical evolution of technical and decorative solutions. This was accompanied by a preliminary survey of the area to identify good practices for the sustainable reuse and valorisation of materials already used in the tradition.

All the information collected is being systematised in digital files (Fig. 1), containing architectural descriptions, information on materials, analysis of construction techniques and historical backgrounds. Advanced digital tools, including photogrammetry, 3D modelling and geospatial technologies, were used to support the survey, with the aim of creating accurate, sharable and replicable documentation.

### 3.2 Regenerating

The second phase focuses on regenerating knowledge and practices related to traditional materials, reinterpreted in light of the challenges of sustainable architecture and the circular economy. Through a critical analysis of construction and decorative elements (Fig. 2), recurring technical solutions were identified and their evolution, adaptability, and durability understood. The theoretical framework draws on the studies of Dokter et al. (2021), which highlight the need to cross disciplinary boundaries between architecture and industrial design. Architects focus on building-scale reuse, while industrial designers favour circular business models: regeneration occurs when these perspectives meet. To support design choices, environmental assessments through LCA (Life Cycle Assessment) are necessary to estimate the ecological impact of local materials compared to industrial ones and highlight the environmental benefits of recovering and reusing vernacular resources.


Fig. 2 – *This scheme provides a detailed analysis of the masserias, highlighting its construction, decorative and material characteristics* (Authors, 2025).

These initial stages allow for an in-depth study of the link between historical identity and traditional materials and their adaptation to the local context. Initial case studies of the recovery and reuse of traditional materials were examined to highlight good practices and sustainable valorisation strategies.

### 3.3 Creating

The final phase, creating, corresponds to the design moment when architects and industrial designers work in synergy, translating the acquired knowledge into concrete, sustainable, and contextualised solutions. Starting from the data collected and the analyses carried out, a shared brainstorming process was activated to generate design ideas integrating traditional knowledge, innovation, and circularity. This phase is guided by the principle that 80 per cent of a product's environmental impact is determined in the design phase (European Commission, 2014). For this reason, interdisciplinarity is not only desirable but indispensable: it makes it possible to develop solutions that are rooted in the territory, but scalable, adaptable to other contexts, and compatible with contemporary needs (Fig. 3). The comparative comparison with Spanish realities, which explored European strategies for conserving and adapting rural architecture to the new paradigms of sustainable design, revealed a modus operandi oriented towards sustainability, the reuse of materials and the active involvement of local communities.

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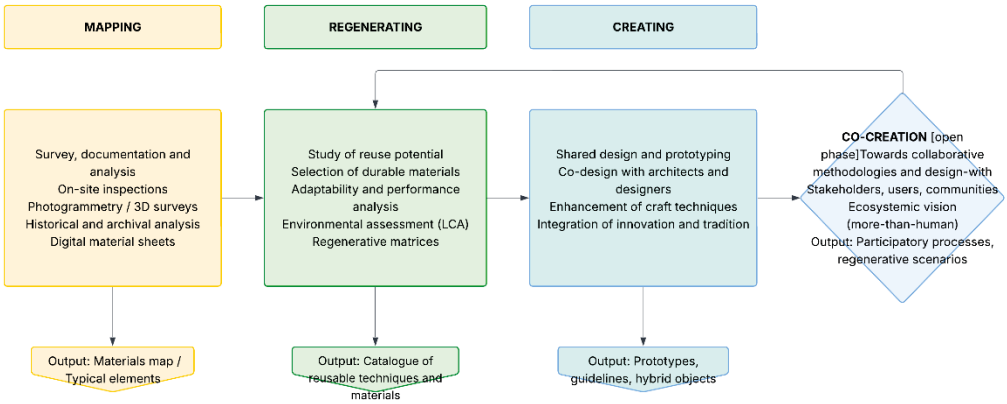


Fig. 3 – *Summary of the various phases adopted. These highlight not only the different outputs produced, but also the transdisciplinary approach that guided the entire process* (Author, 2025).

In many regions, the approach combines technical-digital surveying (such as laser scanning and photogrammetry), documentation of traditional building techniques and participatory design. Relevant examples are the case studies conducted within the framework of European projects such as RURITAGE or the regional experiences of rural regeneration in Catalonia, Andalusia and Galicia. Natural materials - such as unfired earth, lime, marsh cane and wood - are encouraged for environmental reasons and the valorisation of local identities.

Although there is a lack of dedicated national legislation, several European funds and regional programmes support restoration initiatives compatible with local landscapes and climates, thus promoting a rooted but adaptable model of architecture. This phase can, therefore, be further extended by opening up to broader collaborative practices: collaborative methodologies such as co-design, co-creation and participatory design, highlighting how such approaches can facilitate cultural and territorial reactivation through the active involvement of local communities (Di Bernardi et al., 2024), and generate sustainable solutions.

## 4. Results: an innovative model for preserving vernacular heritage

The survey highlighted a rich repertoire of traditional building techniques and practices that constitute the architectural identity of Lucanian masserias. This identity is strongly intertwined with local materials and vernacular building technologies in a relationship of interdependence: on the one hand, these techniques depend on available resources and environmental conditions, and on the other, they contribute to defining the cultural and architectural character of the territory. In Basilicata, this link is manifested in the analysis of the masserias, whose configuration changes over time and space: from rural residences in periods of urban decadence to defensive structures in the Middle Ages, to assuming religious functions.

The morphology of the land has profoundly influenced their architectural features, which are often equipped with defensive elements such as towers and loopholes (Guida et al., 2016). These rural buildings are built with local materials such as limestone and lime plaster, guaranteeing breathability and durability.

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Fig. 4 - *Exterior view of Masseria Mandola Lena (MT). Evident state of abandonment and degradation evidenced by textural erosion.* (Authors, photographic documentation collected during the field research, 2024).

The adoption of thick walls, small openings, and internal courtyards for natural ventilation and drainage systems to collect rainwater not only met climatic requirements but also represented a handed-down knowledge, which generated a coherent and recognisable aesthetic, now a source of inspiration for sustainable design approaches.

The digitisation and mapping of these architectures offer fundamental tools for their protection and valorisation, which are often neglected in planning and conservation processes (Fig. 4). In this context, integrating local materials with contemporary technologies is an effective strategy to promote sustainable building rooted in the territory. A first important aspect emerges from the analysis: the remarkable resilience of traditional structures concerning climate change, which highlights the adaptive value of historical building techniques. A second element concerns the need to classify digitisation levels applied to vernacular architecture. To this end, a grid was developed that distinguishes historical and archival documentation, survey and digital modelling (through HBIM, photogrammetry and laser scanning), valorisation through design and accessibility through open data platforms. An analysis of existing digital platforms, such as Europeana, the ICCD, Hispania Nostra's Lista Roja (Rubio Zorzano, 2022), Google Art & Culture, and tools for sharing HBIM models is underway. Urban Periscope offers an interactive inventory for heritage documentation and analysis. At the same time, Chimera represents an advanced integrated BIM-GIS system for the multi-scale management of 3D models, point clouds, maps and 2D images (Rechichi, 2020). These technologies open up important perspectives for innovation and accessibility in research and conservation.

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Finally, integration with contemporary co-design practices can stimulate the preservation of these assets and their reinterpretation in a design key, generating objects capable of narrating the territory through materials and forms.

These objects, intimately linked to their place of origin, absorb their essence and reflect their identity, counteracting phenomena of homologation and loss of cultural specificity. Masini and Galli (2023) emphasise the importance of recognising the value of the place where an object was born, highlighting how meaning is not assigned a posteriori but inherent in its origin.

If the dialogue with the social and economic disciplines is well established, the relationship with design, be it product, material or communication, opens up a still ongoing reflection. However, it is clear that both architecture and design, in their desire to work "with" and "for" the territory, recognise the value of the local dimension. Magnaghi (2000) observes that ignoring this relationship has led to a growing loss of awareness over time. Adopting shared methodologies, capable of highlighting the material and immaterial qualities of heritage, can generate new practices and strengthen the link between identity and design (Bevilacqua, 2007).

## 5. Conclusion

The lack of systematic research on these buildings limits understanding of their potential in integrating local materials, traditional building techniques and advanced technological solutions. A targeted investigation in this direction has made it possible to develop recovery and reuse strategies consistent with current environmental and social needs, contributing to sustainability models applicable in similar contexts. However, the detailed mapping of traditional materials and the study of the construction and decorative elements of masserias are excessively articulated and time-consuming: in-depth documentary and archival research and fieldwork are followed by reasoned cataloguing. Another limitation of the research concerns the conduct of the co-design tables between architects and designers, in which the objective may not appear clear, being accustomed to a more competitive and less collaborative system. To this end, clarifying the criteria that led to such collaboration can open up dialogue between the different parties. Finally, it may be difficult to objectively evaluate the outcomes of the co-design tables if evaluation parameters are not introduced over the medium to long term, which change according to the final product obtained. Greater comparison with global experiences is necessary to identify best practices and provide a more articulated picture of rural heritage valorisation methodologies.

In conclusion, the results of this research have highlighted the potential of an integrated approach combining historical memory and technological innovation to preserve vernacular architecture. Lucanian masserias have emerged as objects for restoration and narrative elements capable of strengthening territorial identity. Although they are often abandoned places, they have preserved traces, material or immaterial information, that highlight the relationships and networks involving the built and natural territory, productive economies, and signs of knowledge; these traces provide us with significant hints for future trajectories.

In addition, the application of digital tools and the adoption of advanced environmental analysis methodologies have opened up new perspectives for the valorisation and reuse of vernacular architecture, but also for a joint design that does not stop at construction elements but dialogues with the immateriality of the territory and traditions. In this context, the study, recovery and

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valorisation of these structures, and the materials and techniques associated with them, represent a key strategy for fostering cultural, environmental and social sustainability, encouraging new practices, both of reuse and urban regeneration (Dipasquale et al., 2021).

The research suggests that a conservation model based on a transdisciplinary approach can serve as a reference for other similar realities, helping to develop sustainable management strategies for vernacular architectural heritage in the long term. In this sense, this methodology may not only trigger new approaches to design, bringing different, complementary, but different disciplines into collaboration, but also improve the visibility and interest of these settlements and the materials used by a wider, international audience of designers.

## References


Bevilacqua, P. (2007). *The utility of history: The past and other possible worlds*. Donzelli Editore.

Clini, P., Mariotti, C., Angeloni, R., & Muñoz Cádiz, J. (2024). Architectural heritage digital representations for conservation strategies. *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, *XLVIII-2/W4-2024*, 111–118. https://doi.org/10.5194/isprs-archives-XLVIII-2-W4-2024-111-2024

Correia, M., Dipasquale, L., & Mecca, S. (Eds.). (2020). *Heritage for people: Sharing vernacular knowledge to build the future*. Florence University Press.

Cyprus Institute. (n.d.). *Urban Periscope Inventory*. Retrieved January 23, 2025, from https://uperiscope.hpcf.cyi.ac.cy/inventory/

Hadjadji, N., Toulan, N., & Dorra, M. (2024). Impact of digital architecture: The impact of digital technology on ecological formations and its effect on determinants of identity and culture in architectural design. *Journal of Engineering Research*, *12*(3), 285–293. https://doi.org/10.1016/j.jer.2023.09.004

Di Giulio, R. (2024). Digital transition strategies for architectural heritage. In A. Battisti & S. Baiani (Eds.), *ETHICS: Endorse technologies for heritage innovation* (pp. [insert page range]). Springer. https://doi.org/10.1007/978-3-031-50121-0_9

Dipasquale, L., Mecca, S., & Correia, M. (2021). *From vernacular to world heritage*. Florence University Press.

Dokter, G., Thuvander, L., & Rahe, U. (2021). How circular is current design practice? Investigating perspectives across industrial design and architecture in the transition toward a circular economy. *Sustainable Production and Consumption*, *26*, 692–708. https://doi.org/10.1016/j.spc.2020.12.032

European Commission. (2014). *Ecodesign your future: How ecodesign can help the environment by making products smarter*. https://op.europa.eu/en/publication-detail/-/publication/4d42d597-4f92-4498-8e1d-857cc157e6db

Guida, A., Mecca, I., Damone, G., & Scarano, V. (2016). Recupero e trasformazione della Masseria Giordano a Roccanova (Basilicata): Da azienda agricola a "Cattedrale del Vino". In *Convegno ReUSO 2016*.

Magnaghi, A. (2000). *The local project: Toward place consciousness*. Bollati Boringhieri.

Masini, P., & Galli, A. (2023). *The places of design in Italy*. Baldini & Castoldi.

Rechichi, F. (2020). CHIMERA: A BIM+GIS system for cultural heritage. *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, *XLIII-B4-2020*, 493–500. https://doi.org/10.5194/isprs-archives-XLIII-B4-2020-493-2020

Rubio Zorzano, A. (2022). *Análisis de la Lista Roja del Patrimonio de Hispania Nostra* [Undergraduate thesis, Universidad de Oviedo].

Vellinga, M. (Ed.). (2021). *Encyclopedia of vernacular architecture of the world* (2nd ed.). Bloomsbury Publishing.


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