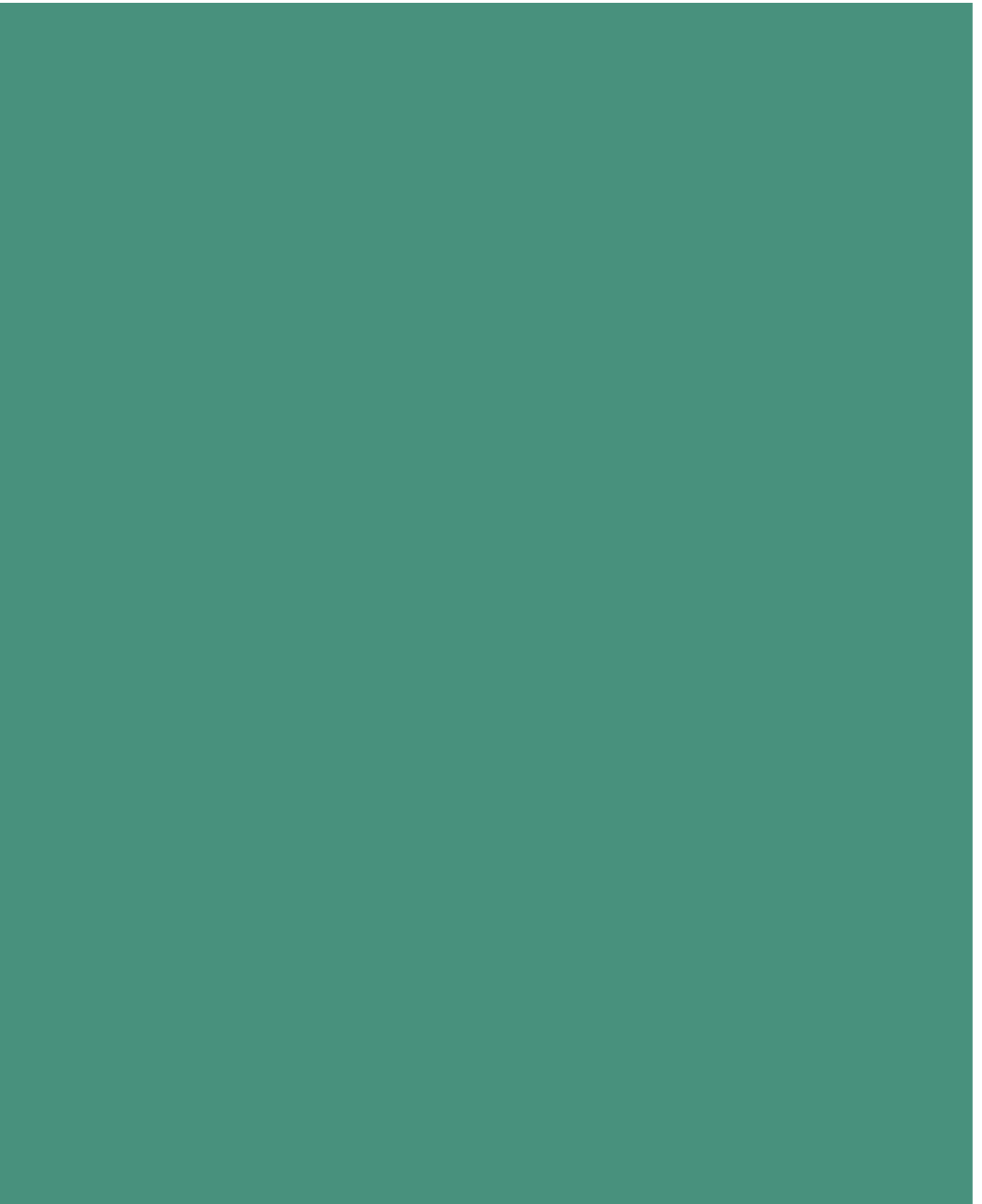


*a cura di*  
LETIZIA DIPASQUALE  
SAVERIO MECCA  
LUCIA MONTONI

## Heritage for people

*Sharing vernacular  
knowledge to build  
the future*







With the support of the  
Culture Programme  
of the European Union



With the support of the  
Culture Programme  
of the European Union



This publication is the result of the project **VerSus+ / Heritage for People** [Grant Agreement Ref. 607593-CREA-1-2019-1-ES-CULT-COOP1], co-funded by the European Union (2019-2023), under the Creative Europe Culture Programme.

The European Commission support for the production of this publication does not constitute endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

This collective work gathers five European university institutions and integrates contributions from the project leader and the project partners. In addition to the Editors, the main contributors are:

#### Project leader



UNIVERSITAT  
POLITÈCNICA  
DE VALÈNCIA

Universitat Politècnica de València, Escuela Técnica Superior de Arquitectura, Spain  
Camilla Mileto, Fernando Vegas (*Project leaders and Principal investigators*), Valentina Cristini, Lidia García-Soriano, Guillermo Guimaraens, Marina Elia, María Lidón de Miguel, Juan María Songel, Juan Bravo Bravo, Jose Luis Baró Zarzo

#### Partners



DICAAR  
DIPARTIMENTO DI INGEGNERIA CIVILE  
AMBIENTALE E ARCHITETTURA  
UNIVERSITÀ DI CAGLIARI

Università degli Studi di Cagliari, Italy  
Maddalena Achenza, Ivan Blečić, Amanda Rivera Vidal, Alice Agus



NS/E  
AG  
ÉCOLE NATIONALE SUPÉRIEURE  
D'ARCHITECTURE DE GRENOBLE

École Nationale Supérieure d'Architecture de Grenoble, France  
Bakonirina Rakotomamonjy (*Principal investigator*), Sebastien Moriset, Nuria Sánchez Muñoz, Manon Mabilille, Audrey Carboneille



UNIVERSITÀ  
DEGLI STUDI  
FIRENZE  
DIDA  
DIPARTIMENTO DI  
ARCHITETTURA

Università degli Studi di Firenze, DIDA Dipartimento di Architettura, Italy  
Letizia Dipasquale (*Principal investigator*), Alessandro Merlo, Saverio Mecca, Lucia Montoni, Edoardo Paolo Ferrari, Gaia Lavoratti, Giulia Lazzari, Matteo Zambelli



UNIVERSIDADE  
PORTUCALENSE

Universidade Portucalense, Portugal  
Mariana Correia (*Principal investigator*), Gilberto Duarte Carlos, Goreti Sousa, Mónica Alcindor, Rui Florentino, Emília Simão, Ana Lima, Telma Ribeiro, Bruno Andrade

#### With the Support of



ICOMOS - CIAV  
International Committee  
of Vernacular Architecture  
International Council on  
Monuments and Sites

International Committee of  
Vernacular Architecture  
ICOMOS-CIAV



ICOMOS - ISCEAH  
International Scientific Committee  
on Earthen Architectural Heritage

International Scientific Committee  
on Earthen Architectural Heritage  
ICOMOS-ISCEAH



UNESCO CHAIR  
earthen architecture,  
building cultures and  
sustainable development  
CRATERRE | AE&CC | ENSAG | UGA

Unesco Chaire *Earthen architecture,  
building cultures and sustainable development*  
CRATERRE | AE&CC | ENSAG | UGA

**Acknowledgments:** Municipality of Formentera and Municipality of Calasetta for the hospitality, European Heritage Volunteers for the valuable photos provided, all the authors for their cooperation and effort.

**English proofreading:** Luis Gatt

**LogoVersus + graphic design:** Teresa Correia, UPT

**Cover:** Kids playing with building materials at the “Grains d’Isère” festival (photo: PatriceDoat)

**Website:** [www.versus-people.webs.upv.es](http://www.versus-people.webs.upv.es) | **Instagram:** VerSus Heritage for PEOPLE | **App:** [www.heritageforpeople.unifi.it](http://www.heritageforpeople.unifi.it)

*a cura di*  
LETIZIA DIPASQUALE  
SAVERIO MECCA  
LUCIA MONTONI

**Heritage for  
people**  
*Sharing vernacular  
knowledge to build  
the future*

**authors**

Maddalena Achenza, Mónica Alcindor, Bruno Andrade, José Baganha, Stefan Balici, Julieta Barada, Sara Bartolini, José Luis Baró, Juan Bravo, Gisella Calcagno, Gilberto Duarte Carlos, Alicia Casals, Carlos Castillo Levicoy, Valentina Cristini, Mariana Correia, Edoardo Paolo Ferrari, Teresa Cunha Ferreira, Soraya Genin, Carmen Gómez Maestro, Borut Juvanac, Marwa Dabaieh, Letizia Dipasquale, Marina Elia, Rui Florentino, Lidia García-Soriano, Alejandro García Hermida, Debora Giorgi, Leticia Grappi, Kin Guerra, Hubert Guillaud, Gaia Lavoratti, Davide Leone, Ana Lima, Saverio Mecca, Alessandro Merlo, Camilla Mileto, Magda Minguzzi, Lucia Montoni, Sebastien Moriset, David Morocho, Cristian Muñoz Catalán, Alina Negru, Amalia Nuevo-Delaunay, Karl Nyqvist, Constanza Pérez Lira, Giacomo Pierucci, Bakonirina Rakotomamonjy, Telma Ribeiro, Amanda Rivera Vidal, Alba Rivero Olmos, Elena Rigano, Nathalie Sabatier, Nuria Sánchez Muñoz, Emilia Simão, Juan María Songel, Goreti Sousa, Angela Squassina, François Streiff, Birgitte Tanderup Eybye, Jorge Tomasi, Antonella Trombadore, Francesco Trovò, Fernando Vegas, Marzia Varaldo, Montserrat Villaverde, Matteo Zambelli.



UNIVERSITÀ  
DEGLI STUDI  
FIRENZE

**DIDA**  
DIPARTIMENTO DI  
ARCHITETTURA

Heritage for people. Sharing vernacular knowledge to build the future / eds. Letizia Dipasquale, Saverio Mecca, Lucia Montoni  
— Firenze - DIDA Press, 2023.

ISBN 9788833382005

*All publications are submitted to an external double refereeing process under the responsibility of the DIDA Scientific Editorial Board.*

Content license: the present work is released under Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0: <https://creativecommons.org/licenses/by-nc-sa/4.0/legalcode>).

Metadata license: all the metadata are released under the Public Domain Dedication license (CC0 1.0 Universal: <https://creativecommons.org/publicdomain/zero/1.0/legalcode>).

Le immagini utilizzate rispondono alla pratica del *fair use* (Copyright Act, 17 U.S.C., 107) essendo finalizzate al commento storico critico e all'insegnamento.

© 2023 Author(s)

Published by



**didapress**

Dipartimento di Architettura  
Università degli Studi di Firenze  
via della Mattonaia, 8 Firenze 50121  
<https://didapress.it/>

*progetto grafico*

**didacommunicationlab**

Dipartimento di Architettura  
Università degli Studi di Firenze

Stampato su carta di pura cellulosa Fedrigoni Arcoset



---

## CONTENTS

---

### INTRODUCTION

Foreword	12
Hubert Guillaud	
Foreword	14
Marwa Dabaieh	
Heritage for People. A project for connecting people with their tangible and intangible heritage	16
Camilla Mileto, Fernando Vegas	

### LESSONS FROM VERNACULAR ARCHITECTURE TO SUSTAINABILITY 30

VerSus Methodology: development and application	32
Gilberto Duarte Carlos, Mariana Correia	
Transmission of the VerSus method to architecture students and lecturers	38
Sebastien Moriset	
From intangible heritage to circular knowledge	44
Letizia Dipasquale, Saverio Mecca, Lucia Montoni	
Indigenous & traditional knowledge systems and the circular paradigm	50
Debora Giorgi	
Diversity and sustainability of traditional architecture in global warming and ecological and digital transitions	56
Saverio Mecca	
Lessons on conservation from vernacular architecture	62
Fernando Vegas, Camilla Mileto, Valentina Cristini, Lidia García-Soriano	
Vernacular parameters of sustainability in 21st century architecture	68
Juan María Songel, Fernando Vegas, Camilla Mileto, Juan Bravo	

### STRATEGIES FOR THE MANAGEMENT AND DISSEMINATION OF TRADITIONAL KNOWLEDGE FOR A SUSTAINABLE FUTURE 74

Conservation and design	76
Fernando Vegas, Camilla Mileto	
Conservation and restoration of traditional architecture	80
Camilla Mileto, Fernando Vegas	

<i>Restoration of a vernacular house in Sesga, Valencia (ES)   Camilla Mileto, Fernando Vegas</i>	86
<i>Urban building on calle Maldonado 33, Valencia (ES)   Fernando Vegas, Camilla Mileto</i>	87
<i>Conservation of a Valencian barraca (ES)   Fernando Vegas, Camilla Mileto</i>	88
<i>The sun temple (IN)   Edoardo Paolo Ferrari</i>	89
<b>Renovation and adaptive reuse of vernacular architecture</b>	<b>90</b>
Letizia Dipasquale	
<i>Alcino Cardoso house renovation by Álvaro Siza (PT)   Teresa Cunha Ferreira, Soraya Genin, Mariana Correia</i>	97
<i>Toolkit for innovative and eco-sustainable renovation process   Lucia Montoni, Gisella Calcagno, Giacomo Pierucci, Antonella Trombadore</i>	98
<i>Renovation of a stone and rammed earth house in Tuscany (IT)   Elena Rigano</i>	99
<i>Memory garden in Vinaroz, Castellón (ES)   Fernando Vegas, Camilla Mileto</i>	100
<i>Renovation, seismic and energy retrofit of a farmhouse in Val di Chiana, Tuscany (IT)   Sara Bartolini</i>	101
<b>Designing with tradition: old techniques for modern architecture</b>	<b>102</b>
José Luis Baró, Fernando Vegas, Camilla Mileto	
<i>Tile vaulting in 21st century   Fernando Vegas, Camilla Mileto, Lidia García-Soriano</i>	108
<i>House of Nature, Silkeborg Højskole by Reværk   Birgitte Tanderup Eybye</i>	109
<i>Ses Menorquines   Alicia Casals, Karl Nyqvist</i>	110
<i>Fan Forest Houses by Bergmeisterwolf Studio (IT)   Matteo Zambelli</i>	111
<b>Education strategies</b>	<b>112</b>
Sebastien Moriset	
<b>Teaching architecture and heritage to kids</b>	<b>118</b>
Sebastien Moriset	
<i>Educational trunk in support of traditional architecture   Camilla Mileto, Fernando Vegas, Lidia García-Soriano, Valentina Cristini</i>	124
<i>Rehabimed kids: workshop on traditional architecture   Letizia Dipasquale, Montserrat Villaverde</i>	125
<i>Practical tools for teaching architecture and heritage to children   Borut Juvanac</i>	126
<i>Elémenterre   Nathalie Sabatier, Alba Rivero Olmos</i>	127



<b>An overview of university and post-university education in vernacular architecture</b>	128
Bruno Andrade, Telma Ribeiro, Mariana Correia, Goreti Sousa, Ana Lima	
<i>DSA: earthen architecture, building cultures and sustainable development</i>   Bakonirina Rakotomamonjy	136
<i>Workshops on traditional trades and preservation of traditional techniques</i>   Camilla Mileto, Fernando Vegas, Valentina Cristini, Lidia García-Soriano	137
<i>The first Traditional Architecture Summer School in Portugal</i>   Rui Florentino, José Baganha, Alejandro García Hermida	138
<i>Teaching vernacular architecture: different pedagogical approaches in higher education</i>   Telma Ribeiro	139
<b>Training with craftspeople and maintenance of traditional knowledge</b>	140
Sebastien Moriset	
<i>The artisans of Venice</i>   Angela Squassina	145
<i>Italian Dry Stone Walling School</i>   Edoardo Paolo Ferrari	146
<i>Restoration of heritage assets programme at Duoc UC professional institute</i>   Carmen Gómez Maestro	147
<b>Community engagement</b>	148
Mónica Alcindor, Emilia Simão	
<b>Traditional heritage preservation and enhancement through community participation</b>	152
Sebastien Moriset	
<i>Terraccogliente experience</i>   Maddalena Achenza	158
<i>El Cabanyal: neighbourhood participation against urban expropriation</i>   Camilla Mileto, Fernando Vegas, David Morocho	159
<i>Adopt a house in Rosia Montana, Romania</i>   Stefan Balici	160
<i>Andean architecture and earthen construction Lab</i>   Julieta Barada, Jorge Tomasi	161
<b>Participating in building and restoring vernacular heritage</b>	162
Fernando Vegas, Camilla Mileto	
<i>Rempart</i>   Fernando Vegas, Camilla Mileto	167
<i>European Heritage Volunteers</i>   Valentina Cristini	168

<i>Cob in Lower Normandy, France</i>   François Streiff	169
<b>Gamification for community engagement in heritage and sustainability</b> Alessandro Merlo, Letizia Dipasquale	170
<i>Calasetta heritage games</i>   Amanda Rivera Vidal, Maddalena Achenza	176
<i>Artisans to the rescue</i>   Davide Leone	177
<i>The Seven Families of Formentera</i>   Nuria Sánchez Muñoz	178
<i>Contahistoria</i>   Camilla Mileto, Fernando Vegas, Marina Elia	179
<b>Knowledge management and dissemination</b> Letizia Dipasquale, Saverio Mecca	180
<b>Documenting and safeguarding intangible heritage</b> Letizia Dipasquale, Edoardo Paolo Ferrari	184
<i>Ràixe: Digital Spaces for Tabarkan Culture</i>   Marzia Varaldo	190
<i>Practices of Cultural Re-appropriation: projects in co-authorship with the First Indigenous Peoples of South Africa</i>   Magda Minguzzi	191
<i>The village of Esfahak: knowledge transmission on vernacular construction techniques in the Iranian desert</i>   Edoardo Paolo Ferrari	192
<i>Red de maestros - network of master builders</i>   Camilla Mileto, Fernando Vegas, Valentina Cristini	193
<b>Documentation and digital survey of tangible heritage</b> Alessandro Merlo, Gaia Lavoratti	194
<i>International workshops on traditional architecture in Rincón de Ademuz, Valencia (Spain)</i> Fernando Vegas, Camilla Mileto	200
<i>Documenting and virtual visiting World Heritage in 3DPAST</i>   Mariana Correia, Gilberto Carlos	201
<i>3D survey of the vernacular architecture of the Aysén region</i>   Carlos Castillo Levicoy, Constanza Pérez Lira, Amalia Nuevo-Delaunay	202
<i>Modelling traditional knowledge on earthen domes of Syria</i>   Letizia Dipasquale, Saverio Mecca	203
<b>Managing constructive and architectural knowledge for builders and designers</b> Letizia Dipasquale, Telma Ribeiro, Rui Florentino, Mariana Correia	204

<i>Heritage for people: a collaborative app</i>   Letizia Dipasquale, Lucia Montoni, Edoardo Paolo Ferrari	210
<i>Learning to conserve</i>   Fernando Vegas, Camilla Mileto	211
<i>Cartoterra</i>   Sebastien Moriset	212
<i>Mapadaterra platform</i>   Leticia Grappi, Kin Guerra	213
<b>Sharing knowledge with a wide public</b> Sebastien Moriset	214
<i>Full Immersion nella Terra</i>   Maddalena Achenza	219
<i>Grains d'Isère Festival</i>   Bakonirina Rakotomamonjy	220
<i>Homo faber Exhibition</i>   Francesco Trovò	221
<i>Regio heart</i>   Alina Negru	222
<i>El Adobe educational video</i>   Amanda Rivera Vidal, Cristian Muñoz Catalán	223
<b>CASE STUDIES: FORMENTERA AND SANT'ANTIOCO ISLANDS</b>	<b>224</b>
<b>Formentera: cultural heritage and sustainability</b> Fernando Vegas, Camilla Mileto, Lidia García-Soriano, Valentina Cristini	226
<b>Sant'Antioco: cultural heritage and sustainability</b> Letizia Dipasquale, Alessandro Merlo, Gaia Lavoratti, Lucia Montoni, Maddalena Achenza	240



---

## CONSERVATION AND RESTORATION OF TRADITIONAL ARCHITECTURE

---

**Camilla Mileto, Fernando Vegas**

Universitat Politècnica de València, Valencia, Spain

Traditional architecture goes beyond an established concept or image. It does not respond only to its builders' project, engineered and manufactured from arcana and artisanal gestures (Vegas, Mileto, 2011). The architectural forms which have evolved over centuries are not merely the result of the local availability of materials and climate conditions, but the result of many centuries of trial and error. In addition to these factors we find another vital component: culture. Traditional culture is made up of the trades, processes and techniques, the relationship with the territory and the landscape, the forms of use of architecture and its status as framework for socialisation. Traditional architecture is therefore not only tangible heritage, but also an important intangible heritage which cannot be separated from it.

This brings up the need to question what is conserved when restoration work is carried out on traditional architecture. Undoubtedly, the building as object is conserved, but at the same time so is all the intangible baggage of the architecture, contemplating the history of its culture, tradition, materials, ancient construction techniques, and probably also its connection with the surroundings, manufacturing processes, transmission of knowledge to guarantee its survival, etc. (Mileto et al., 2020).

The conservation of traditional architecture is not an exercise limited solely to protecting or freezing a building but is also a dynamic action, which has the capacity to transmit knowledge, educate and raise awareness among owners, residents, intervention stakeholders, tourists and the general public. This is a feedback process, as the greater the awareness, the higher the expectations for the protection and conservation of other examples of vernacular architecture, both locally and beyond.

In view of the complex nature of traditional architecture, what are we conserving when we undertake the restoration of a traditional vernacular building?

The answer is nuanced, since the restoration of traditional architecture, when carried out with respect, sensitivity and full awareness of its substance, entails, among other things, the conservation of the material form, the reactivation of trades, the promotion of the local economy, the fight against depopulation, the reaffirmation of cultural identity, the defence of the natural territory and landscape, the promotion of sustainable tourism, and actions against climate change.

*opposite page*  
**Sod constructions, Iceland.**  
The conservation and enhancement of the vernacular architecture characteristic of each place, such as this building, simultaneously allows the reaffirmation of the local identity  
*(credits: authors)*



The material conservation in wooden architecture in Finland means over time replacing damaged parts using the same construction techniques

The conservation of traditional thatched houses in Miyama (Japan) has encouraged the revitalization of the thatching craft

(credits: authors)

### Conservation of the material form

The restoration of traditional architecture aims mainly to preserve the material form of the original building in a manner compatible with its intended new use or distribution and installation updates to contemporary standards. Often, material conservation also entails the preservation of the typical construction or imprints of the artisanal execution of this type of building, which are so closely linked to the human experience of traditional master builders. In material terms, the conservation of the building is also the conservation of an object which can be further studied in the future as a source of knowledge concerning materials, construction techniques, degradation or conservation processes, and traditional prevention and conservation processes. Furthermore, the restoration of a given type of architecture requires a deliberate attempt to understand the previous uses and functions of these spaces, their reciprocal relationship and distribution, their relationship to people and social and family structures, as well as aspects such as lighting, ventilation, regulation of temperature and sun exposure, etc.

### Renewed popularity of trades

The restoration of traditional architecture often also entails the conservation or promotion of local or regional traditional trades. Restoration does not always equal the reproduction of parts, elements, or techniques belonging to historic architecture, but it does require a knowledge and understanding of the architecture of the past in order to repair it.

Traditional trades which are actively conserved and safe from globalising construction trends allow both the filling of the *lacunae* found in the building and the repair of its construction. In extreme cases, where traditional trades have completely disappeared, restoration offers the opportunity to rediscover materials and techniques, reactivating them through use.



### Promotion of the local economy

This reactivation of trades not only affects the survival of this individual artisanal and manufacturing culture, but also the promotion of the local economy. In fact, for the same cost, the investment in restoration, particularly the restoration of vernacular architecture, leads to a higher percentage of local labour hired compared to new constructions, where higher percentages are allocated to the acquisition of pre-mixed or prefabricated materials, usually in locations far from the construction (Mileto, Vegas, 2006).

### Fight against depopulation

A second and equally important consequence of the reactivation of trades is the settlement of population in areas which are often rural and at risk of depopulation. If local economic activity provides the necessary living means to support a family, not only does the local population remain, but there is also an influx of people in search of work. This has been the case in rural areas which welcome manual labour from other countries to cover the growing demand.

### Reaffirmation of cultural identity

The restoration of the traditional architecture of a given area, with its authentic character, simply strengthens its personality and distinctive nature when compared to other regions and to other transformed or globalised urban settlements. This defence of individual culture with reference to the built matter generates or strengthens the feeling of identity and, as a result, a growing desire to respect and conserve it from external interference that is not strictly necessary.



#### Historic center of La Alberca, Salamanca, Spain.

The conservation of environments with their original vernacular character also promotes sustainable tourism

#### Half-timber wall in Garganta La Olla, Cáceres, Spain.

The restoration of vernacular architecture in the face of a possible replacement constitutes an action to fight against climate change due to the enormous savings of energy and carbon emissions into the atmosphere

(credits: authors)



The rehabilitation and restoration of rural houses and auxiliary buildings on the island of Formentera defends the territory and the natural landscape against the threat of speculative urbanism

*(credits: authors)*



### Defence of the natural territory and landscape

For a number of reasons the restoration of existing traditional architecture does not only involve the re-affirmation of cultural identity but also often the defence of the surrounding natural territory and landscape. From the outset it avoids the need for the construction of new buildings using contemporary materials and techniques which often distort the surroundings; it is a preventive measure against unnecessary or excessive growth of nuclei through expansions, at least whenever there are historic buildings available for reuse, and it reduces the impact on quarries and the exploitation of materials in the immediate surroundings of traditional locations.



### Promotion of sustainable tourism

The conservation of cultural identity also attracts sustainable tourism, often directed to inland nuclei and regions in areas where there is no coast. These tourists visit the sites in question attracted by the integration of natural and cultural landscape and the authentic vernacular architecture which can still be found in them.

### Action against climate change

The restoration of traditional architecture, especially when resorting to traditional local construction materials and techniques, characteristically sustainable and circular in nature, is also a silent and anonymous, yet ultimately powerful action in the fight against climate change. Recent studies have estimated savings of up to 80% compared to the carbon footprint caused by the new construction of a similar building and 50% in relation to the carbon footprint generated by a restoration using industrial materials (Mileto et al., 2021). Therefore, while from the perspective of climate change it is convenient to conserve the existing building, its restoration using traditional construction materials and techniques is also doubly useful and efficient.

### References

- Mileto C., Vegas F. 2006, *La restauración de la arquitectura tradicional como recuperación de los valores culturales y desarrollo económico. La experiencia en el Rincón de Ademuz (Valencia)*, in *Actas del II Congreso Internacional de Patrimonio Cultural y Cooperación al Desarrollo, Valencia, Spain. 8-10 June 2006*. Universitat Politècnica de València (PUV), Valencia, pp. 256-265.
- Mileto C., Vegas F., Diodato M., Cristini V., García L. 2020, *3D Past. Guidelines and strategies for maintenance of vernacular architecture in World Heritage Sites*, La Imprenta, Valencia.
- Mileto C., Vegas F., Llatas C., Soust-Verdaguer B. 2021, *A Sustainable approach for the refurbishment process of vernacular heritage: the Sesga house case study (Valencia, Spain)*, «Sustainability 2021», no. 13, 9800, <https://doi.org/10.3390/su13179800>.
- Vegas F., Mileto C. 2011, *Aprendiendo a restaurar. Un manual de restauración de la arquitectura tradicional de la Comunidad Valenciana*, COACV, Valencia.

## RESTORATION OF A VERNACULAR HOUSE IN SESGA, VALENCIA (ES)

Camilla Mileto, Fernando Vegas

Universitat Politècnica de València, Valencia, Spain

### ARCHITECTS

Fernando Vegas and Camilla Mileto

### QUANTITY SURVEYOR

Salvador Tomás Márquez

### PROMOTERS

Fernando Vegas and Camilla Mileto

### VERSUS SUSTAINABILITY PRINCIPLES

2. Taking benefit from natural and climatic resources
3. Reducing pollution
4. Ensuring environmental comfort and well being
5. Reducing disaster risks
7. Transmitting and sharing building cultures
8. Encouraging creativity
9. Recognising intangible values
11. Supporting autonomy
12. Promoting local activities
13. Optimising construction efforts
14. Extending lifetime
15. Saving resources



House at Sesga once restored  
Applying the waxed gypsum  
flooring  
(credits: F. Vegas, C. Mileto)

This humble house which, based on the dendrochronological analysis, was originally built in 1732, was reconstructed and enlarged during the Forties of the 20th century, in both cases using traditional local construction techniques: structural pillars made of gypsum, jack arch floors with logs and gypsum-poured vaulting, thatched and tile roofs, walls in masonry or stone masonry, and partitions made with stone slabs bonded with gypsum. The restoration of this house, which was in a deplorable state of preservation due to being abandoned for fifty years, has made use of local trades, craftsmen and materials, as well as of traditional construction techniques, or an interpretation of them for the sake of compatibility, decarbonisation and sustainability, understood in their broadest sense. The collapsed sections have been reconstructed using wooden logs and gypsum-poured vaulting, the traditional reed board of the roof plane was plastered over; the roof tiles were bonded with a mixture of earth and straw to increase adhesion and flexibility against the movements created by the thermal gradient. The historical carpentry of doors, gates, shutters and partitions have been consolidated, and the masonry walls of the first floor have been grouted with clay, in accordance with tradition, to avoid the rise of humidity by capillarity. After several lab tests using different gypsums and plant-based reinforcements, some innovations, based in tradition, were introduced, such as the compression layers of the floors using gypsum reinforced with reeds or a hemp rope mesh and the plastering reinforced with tightened strings, or the insertion of log ties, the use of traditional waxed gypsum or burnished limecrete pavements, the restoration of the original furniture, etc. Preference has been given to work units with a high proportion of manual labour instead of favouring alternatives with a greater presence of machinery or processed materials, in order to promote the local trades and craftsmen. It has been possible to demonstrate with numbers that restoration interventions benefit the local activity and local economy to a much greater extent than a similar project involving a new construction. Finally, a Life Cycle Assessment of the restoration of this house with local materials and traditional techniques has been carried out, which shows an extraordinary potential in terms of decarbonisation for the environment, not only compared to a new building of similar characteristics, but also compared to a similar restoration carried out with already processed industrial materials.



**URBAN BUILDING ON CALLE MALDONADO 33, VALENCIA (ES)**

**Fernando Vegas, Camilla Mileto**  
 Universitat Politècnica de València, Valencia, Spain

This nondescript urban building located in the historic center of Valencia, being under no heritage protection, was initially condemned to be demolished and replaced with another social housing building of similar characteristics. At the proposal of the architects, the building was restored in its current state. Research in the historical archives, with the support of mensiochronology, dendrochronology and chronotypology, and a study of the building's materials and construction techniques, allowed dating its original construction to approximately 1580, as well as subsequent alterations carried out during the second half of the 18th century, in 1864 and 1900, which had concealed its former configuration and true antiquity. The building had been constructed with brick walls, jack arch floors with flat-tile vaulting filled with gypsum and roof with timber rafters and ceramic board covered with tiles. It also included half-timber walls in the courtyard with dovetail joints whose construction dated back to the 18th century. This is a technique that was quite common in the past, yet has practically disappeared from the historic center of Valencia. The project resulted in three social housing apartments, one for each floor, as well as a commercial unit on the ground floor. The inclined floors were reinforced and leveled with wooden trusses; the timber of beams and joists was repaired and the deflection of the joists was leveled with wooden ribs, which also added bearing capacity; the floors were consolidated with a dry compression layer of plywood; the colored cement tiles were restored; the corroded anchorings of the balconies were repaired, as well as all historical ironwork and woodwork; the historical wooden eaves overlooking the courtyard were recovered; a treatment was applied against the termites that were damaging the building; the simple ornamental paintings that decorated the 18th century gypsum jack arch vaulting of the floors were recovered; and finally service installations were upgraded to contemporary residential standards. The result was the same three social housing apartment building which was to be built anew by demolishing the existing building, but at a much lower cost and with an extraordinary added bonus in terms of history, spatial quality and traditional finishings.

**ARCHITECTS**

Fernando Vegas and Camilla Mileto

**QUANTITY SURVEYOR**

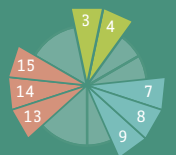
Francisco Hidalgo Delgado

**DEVELOPER**

Municipality of Valencia

**VERSUS SUSTAINABILITY PRINCIPLES**

- 3. Reducing pollution
- 4. Ensuring environmental comfort and well being
- 7. Transmitting and sharing building cultures
- 8. Encouraging creativity
- 9. Recognising intangible values
- 13. Optimising construction efforts
- 14. Extending lifetime
- 15. Saving resources



A view of the building from the street

Inside of the restored apartment

(credits: F. Vegas, C. Mileto)



## CONSERVATION OF A VALENCIAN BARRACA (ES)

Fernando Vegas, Camilla Mileto

Universitat Politècnica de València, Valencia, Spain

### ARCHITECTS

Fernando Vegas and Camilla Mileto

### QUANTITY SURVEYOR

Salvador Tomás Márquez

### BUILDING SUPERVISION

Fernando Vegas, Camilla Mileto and Miguel Ortiz

### VERSUS SUSTAINABILITY PRINCIPLES

2. Taking benefit from natural and climatic resources
3. Reducing pollution
4. Ensuring environmental comfort and well being
5. Reducing disaster risks
7. Transmitting and sharing building cultures
8. Encouraging creativity
9. Recognising intangible values
11. Supporting autonomy
12. Promoting local activities
13. Optimising construction efforts
14. Extending lifetime
15. Saving resources



Building the reed layer of a traditional barraca  
(credits: S. Tomasi)

The thatched barraca after restoration

Internal view of the restored thatched barraca  
(credits: V. Jimenez)

The *barraca* is a traditional dwelling from the area surrounding the city of Valencia (Spain), found in the southern lagoon area and in the cultivated areas to the north, as well as in the old fishermen's quarters on the Mediterranean coast. This vernacular architecture, housing for fishermen and agricultural workers, is part of the tradition of building around Mediterranean bodies of water, as well as other marshes and lakesides worldwide. *Barraca* walls were built with adobe, wattle-and-daub or cob walls and the roof was thatched on timber structures and reeds. This heritage, which is both local and global and is a clear representation of a now-extinct culture, has long been neglected, replaced and mistreated. Only recently, on the verge of complete extinction, has it been highlighted as cultural heritage and as a source of information on environmental, socio-cultural and socio-economic sustainability in relation to circular economy and climate change. The adapted reuse being carried out in the listed *barraca* of the Aranda family was based both on extensive research aimed to recover materials, techniques, and trades, and on the dissemination of the local and global values of these buildings and the tangible and intangible culture they harbour through lectures, documentaries, technical specialist visits, students, administrations, etc. The aim is to prevent this adapted reuse from remaining merely an isolated action, in order to become instead part of a process which enables knowledge, valorisation, conservation, education, training, awareness and innovation.

The conservation process of the *barraca* of the Aranda family began by dismantling the remains of the timber structure which had collapsed partly due to termite damage. Subsequently, the adobe walls, which were at a 75 degree angle due to the thrust from the roof rafters, were reinforced following the disappearance of the tie beams that provided stability to the structure. This reinforcement consisted in adding a side foundation underpinning in lime concrete and a new adobe wall on the outer side of both longitudinal walls, connecting the new and the original walls so that they work jointly. The timber structure was then assembled, adding the reed board, gypsum render, and other intermediate gypsum and cork layers in compliance with current fire regulations, before thatching the roof back.

