

sous la direction de  
LAMIA HADDA  
SAVERIO MECCA  
GIOVANNI PANCANI  
MASSIMO CARTA  
FABIO FRATINI  
STEFANO GALASSI  
DANIELA PITTALUGA

## Villages et quartiers à risque d'abandon

*Stratégies pour la connaissance,  
la valorisation et la restauration*

TOME 1

FIRENZE  
UNIVERSITY  
PRESS



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TOME 1



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Tunisie, village berbère de Zriba el-Alia (© L. Hadda)

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# TRADITIONAL MASONRY BUILDINGS ON THE TUSCAN APENNINE MOUNTAINS. THE ABANDONED VILLAGES AROUND FIRENZUOLA

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The upper valley of Santerno river with the villages investigated (map from Regione Toscana).

**Michele Coppola, Letizia Dipasquale**  
Università degli Studi di Firenze-Italia

This work is part of an ongoing project developed by a team made up of researchers, young undergraduates and fellows from the Department of Architecture of the University of Florence. The general aim is to provide a contribution to the knowledge of the rural architecture of Upper Mugello to enhance more aware recovery actions. The investigation concerns the recovery of building techniques, the preservation of the authentic characters of ruined buildings and the development of maintenance procedures. The focus area is the territory of Firenzuola, along the Santerno river and its main tributaries. Several abandoned villages have been identified as case studies, including Pratalecchia, Brento Sanico and Castiglioncello. The research is set up in two parallel actions of investigation: the first is dedicated to the study of documentary sources for the reconstruction of the historical and construction events of the settlements, the second is aimed at the direct study of the buildings. The results of the first investigations carried out on the village of Pratalecchia are presented here. A general picture can be outlined of basic architectural models and their evolutions, the building techniques, the architectural languages to be safeguarded and the main causes of deterioration. The work made it possible to set up further extensions of the survey to other settlements and to outline a first methodological approach for the sustainable recovery of the architectural heritage of these rural areas.

**Key-words:** Rural architecture, typological investigations, sustainable conservation, Tuscan Apennines

## The abandoned settlements of the Santerno valley. Criticalities and resources

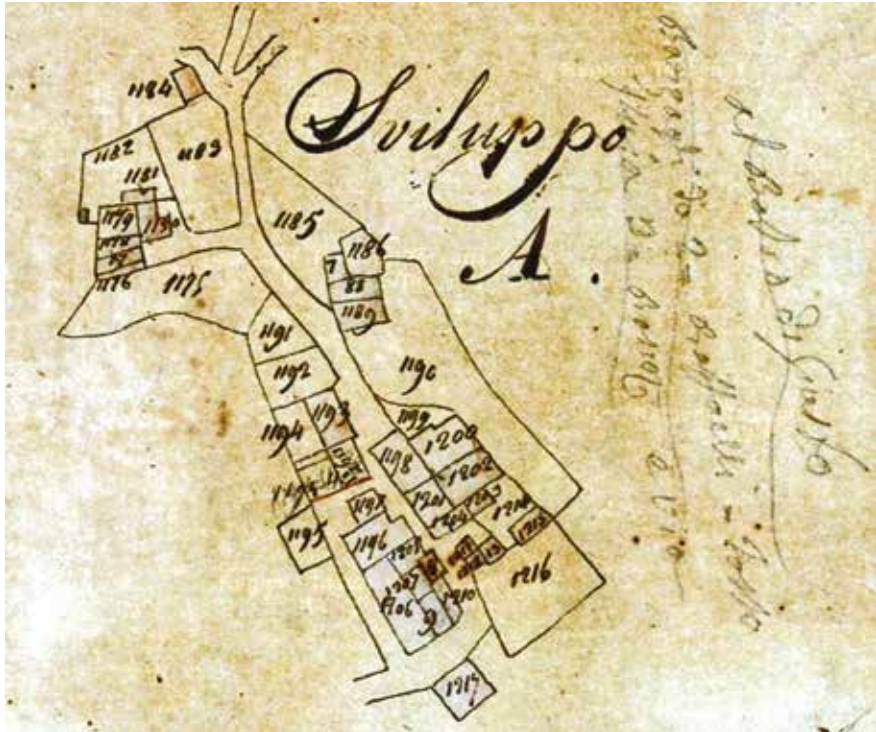
In Italy, the abandonment of rural towns is a broad and transversal phenomenon. Over the decades there has been an intensification of studies and projects aimed at the knowledge and recovery of this vast heritage.<sup>1</sup> However, this attention does not always lead to concrete recovery actions and many settlements remain in the state of ruin. Recovery actions are hampered by issues of a financial nature, sustainability, and the fragmentation of properties into countless heirs. In this dimension, their frequentation, if the access ways are still practicable, is limited to hiking and local authorities just secure the unsafe parts of the buildings. There is

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<sup>1</sup> Studies on regional characters of rural architecture are many in Italy, developed over the last decades (Agostini 1999, Giliberti 2009, Piccinno 2006). Several recovery initiatives are led by different subjects: since 2001, the “Canova” association, together with the Polytechnic of Milan and Turin, has been involved in the recovery of abandoned rural villages in the Piedmontese Alps, promoting school construction sites.



**Fig. 2**  
Plan of  
Pratalechia  
village in 1835  
(Archivio di Stato  
di Firenze, Catasto  
Generale Toscano,  
Comunità di  
Firenzuola,  
Sezione U, foglio  
6).



no lack of initiatives for the recovery (widespread hotels, farms, etc.), however, in the absence of clear protocols, incorrect interventions can compromise the conservation of the authentic (technological and cultural) characters of these architectures.

### Objectives and methodologies

This investigation on the abandoned villages in the Tuscan Apennines, aims to draft guidelines for their rehabilitation. The methodological approach is based on the study of a representative sample, on which to calibrate adequate recognition, knowledge and diagnosis procedures. The sample chosen is the area of the so-called “Alpe Fiorentina”, in the Firenzuola territory. Four villages have been selected (Piagnole, Castiglioncello, Brento Sanico and Pratalechia) in the upper Santerno valley. The study is divided into multi-scale investigations, aimed at identifying characters of cultural testimony (recognizing), technological and formal characteristics (knowledge), physical and cultural damage and risks (diagnosis). The first phase, addressed to the documentary sources,

made it possible to trace a preliminary historical evolutionary line of these settlements, which was followed by the field-investigation phase for their material knowledge. Through filing, surveys and reading of the remains (typology and stratigraphy), data on architecture, materials, construction techniques and decay processes were collected.

### **Firenzuola and its villages**

The upper Santerno valley (with its main tributaries, Diaterna and Rovigo) is one of the natural historical links between Tuscany and Romagna (Fig. 1). Its settlement system intensified between the 12th and 14th centuries, under the dominion of the Ubaldini family who built several castles to guard the only ridge road following the river. The sequence of fortified structures included the ancient castle on Santerno near Firenzuola, the one on Monte Coloreta, the one on Monte Caprile, the one in Piagnole on the Diaterna and continued towards Imola, including Tirli and Castiglioncello.<sup>2</sup> The strategic importance of this territory led to a clash between the Ubaldini family and Florence, which reached its peak with the Florentine foundation of Firenzuola in 1332 and ended with the defeat of the Ubaldini (1373) who sold their castles one after another, to the Florentines.<sup>3</sup> In the following centuries the medieval settlement system was reconfirmed and supplemented by new installations linked to the main economic activities of the valley. Between the 16th and 17th centuries, the presence of mills along the rivers increased, while on the heights inhabited centers developed for the management of pastures, chestnut groves and the production of coal.<sup>4</sup> The maximum expansion of rural settlements occurred in the 19th century, with the intensification of trade with Romagna. The presence of the rural areas of Mugello gradually decreased during the 20th century. The destruction of Firenzuola during the WW2 did not stop the gradual abandonment of the villages in favor of the larger towns, which reached its peak during the years of reconstruction.

### **The Village of Pratalecchia**

The origins of Pratalecchia are not known. The oldest date, engraved on an architrave, shows the year 1814, but the age of the oldest domestic chestnut trees, estimated at 300 years, indicates a previous presence. Some documents indicate Pratalecchia as a “farm”, which in

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<sup>2</sup> An interesting study on the Ubaldini Family castles has been carried out by the “Ubaldini Project”, collecting all the information coming from the literature sources (De Fraja 2014).

<sup>3</sup> The episode is narrated in the Giovanni Villani’s “Nuova Cronica” (book XI, chap. CC), written between 1308 and 1348 (Villani, 2007).

<sup>4</sup> A wide description of Firenzuola, its history and its territory is done in the Geographic Dictionary of Tuscany (Repetti 1835, pp. 286-294).





**Fig. 3**  
The village of  
Prataleccia.



1835 had almost reached its current consistency (Fig. 2).<sup>5</sup> Oral testimonies attest to the presence of about 70-80 inhabitants and building activities in the early 1900s. The earthquakes of the late 19th century and especially the 1919 earthquake did not leave clear traces on the buildings.<sup>6</sup> Any damage could have triggered transformation and expansion initiatives (evident on numerous elevations) that went beyond simple repair. From the mid-1960s, with the disappearance of the last inhabitant, the frequentation of Prataleccia was limited to the seasonal management of the chestnut grove. The village stands on the summit plateau (591 m asl) of a hill in the Monte Caprile group (812 m asl), with a south side that slopes towards the river and a very steep north-east side. The sloping clearings adjacent to the town were used for grazing and drained water to the gardens below. The south-facing slopes were arranged in terraced orchards. The chestnut groves occupy the range between 550 and 650 m asl.<sup>7</sup> The water supply was initially guaranteed from a

<sup>5</sup> A detailed plan of the village was drafted in the general land registry of Tuscany made in 19th century (Archivio di Stato di Firenze, Catasto Generale Toscano, Comunità di Firenzezuola, Sezione U, foglio 6). The owners of the farm changed in 1835 (Gazzetta di Firenze, n. 94, 6 Agosto 1835).

<sup>6</sup> Data from "Archivio Storico Macrosismico Italiano (ASMI)" of the "Istituto Nazionale di Geofisica e Vulcanologia (INGV)".

<sup>7</sup> The surrounding woods also were arranged with retaining walls, mule tracks, clearings for charcoal piles.



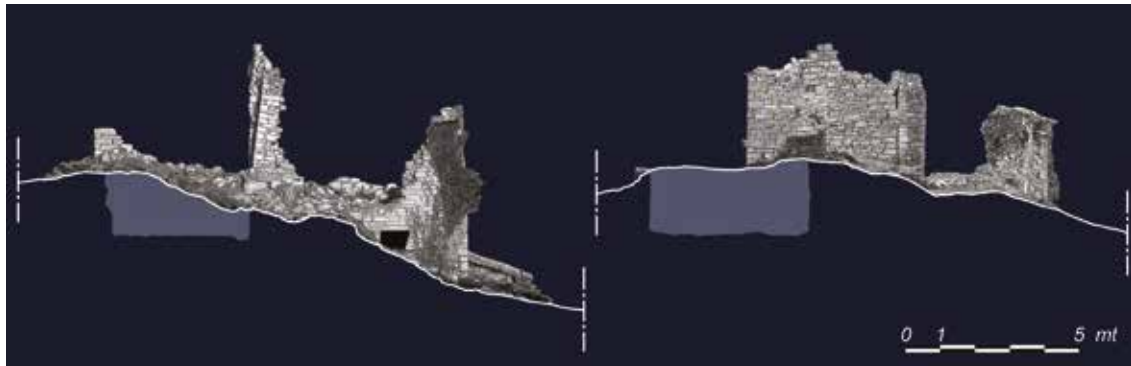
source about 400 m north east of the town and from a well/cistern. Later some houses were equipped with masonry cisterns for rainwater. (Fig. 3)

### **The field survey**

For the purposes of the survey, the village was divided into 12 blocks of buildings (Fig. 3). For each block a general form has been compiled with detailed sections on the individual construction units. It collects qualitative and quantitative data on the building and its parts: architectural, typological, technological characters, processes of decay. A detailed survey was carried out for each building to create the basis for thematic elaborations and for the planning of further steps of investigation (Fig. 4).

### **Morphology of the settlement and architectural features**

The buildings of Pratalechia are divided into houses and service buildings (Fig. 5). The correspondences with other villages confirm the circulation of architectural models, declined according to the site and specific needs. The standard house had two superimposed rooms (kitchen on the ground floor) connected by a wooden staircase. This scheme could vary



**Fig. 4**  
Elevations of  
the remains of a  
house (block n.  
12).

according to the position on a slope (additional basement room) or the aggregation of multiple buildings (moving accesses and connections between levels). The most common service buildings were stables and chestnut drying-houses. The stable consisted of a ground floor room for the animals and an upper level used as a barn. The drying-house consisted of two superimposed rooms with independent entrances: the combustion chamber on the ground floor; a trellis constituted the upper-level floor which housed the fruits to be dried. Other buildings were wood ovens, often with a compartment below the cooking chamber used as a winter shelter for small animals. The buildings were distributed along a main street: houses were placed along the south side, the service buildings on the opposite side.<sup>8</sup>



**Fig. 5**  
Architectural  
models of the  
buildings (stable  
on the left, house  
aggregation on  
the right).

### The role of building transformations

Evident traces of layered transformations on many buildings, frequently reworked as needs changed, confirm their evolutionary nature.<sup>9</sup> Stratigraphic investigations on the elevations allowed to identify phases and methods of transformation, tracing standard sequences and punctual solutions for modifying the original volumes (Fig. 6). The prevailing scheme envisaged two directions of aggregation: vertical (overlapping) and horizontal (side by side). The process could confirm the original functions (extension of a house or a stable) or cause a change of intended use (oven incorporated in a drying-house or drying-house enlarged in a home) (Fig. 7). Some technical devices flanked

<sup>8</sup> In Prataleccchia there was no church; for religious functions, people referred to the parish church of San Pietro, 2 km to the west.

<sup>9</sup> This is a common phenomenon in rural architecture, which can be recognized in many other Italian areas (Guccini 2011).





these aggregations, such as the insertion of stone blocks connecting the walls. In some cases these elements were inserted on the edges of the buildings, for future extensions.

### The architectural elements

In the study of rural architecture, the investigation of recurring architectural elements plays a crucial role. Being the realizations in which the cultural characteristics are more concentrated (technical and formal culture) their knowledge allows to identify the values to be safeguarded, especially in view of integration actions.<sup>10</sup> From another point of view, the typological investigation of the elements (openings, sinks, fireplaces) supports the understanding of the construction phases with the preparation of relative chronologies.<sup>11</sup>

In Pratalechia, the investigation conducted on the openings led to the compilation of a preliminary catalog, which can be linked to those carried out in the neighboring villages (Figure 8). Several characters were taken into consideration for the typological survey: general morphology, shape of the jambs, lintels and window sill, materials, traces of tools. 10 types of windows have been identified. The first 3 are those with the highest frequency, relating to the major building activities. Although an extension of the survey to other villages is necessary, the preliminary results seem to show that the oldest models are characterized by the use

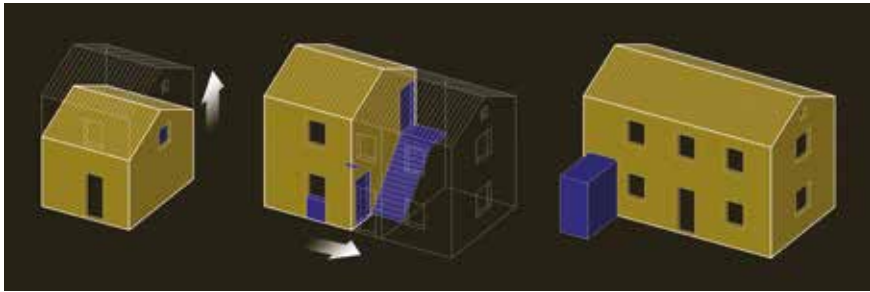
<sup>10</sup> For the methodology of typological investigation followed in this study see: Coppola 2018.

<sup>11</sup> An important tradition of studies in this field is carried out by the Ligurian scholars, heirs of the Tiziano Mannoni school (Mannoni 1976, Boato 2015).



**Fig. 6**  
Stratigraphic and typological investigations on the buildings.

**Fig. 7**  
Sequence of the main transformations of the block n. 2, from a drying-house to a home.



of large, irregular blocks. In a subsequent phase, the blocks of the same size appear to be smoothed in a very accurate way with a strong presence of traces. The newer models are characterized by equally accurate but simpler and more standardized solutions.

### Materials and building techniques

All the construction systems recorded are the combination of three materials: sandstone, earth mortar and chestnut wood (Figure 9). The stone comes from the Marnoso Arenacea formation, which has been exploited for centuries in this area for the extraction of the local lithotype, now marketed as “Firenzuola stone”. The centuries-old mining activity has favored the development of a consolidated local technical culture with the spread of the figures of stonemasons and a wide range of working tools. The use of this stone varies according to the outcrops. The major blocks, intended for corners, jambs, architraves and sinks, underwent a more careful selection and are rich in working traces. The

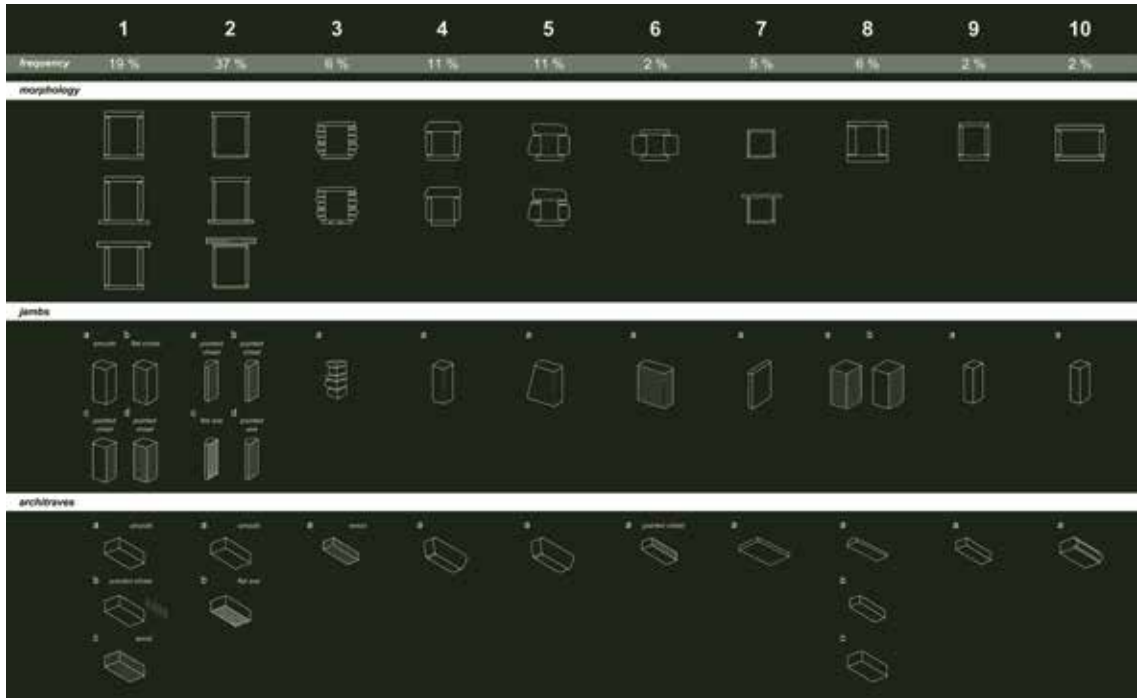
recorded traces belong to tools such as pickaxe, hammer, flat and toothed axe, flat and pointed chisel, used in a versatile way (roughing, regularization, flattening), with different finishing patterns (straight, oblique or herringbone).<sup>12</sup> The blocks of the walls were split from the layers of rock with a thickness of a few tens of centimeters. The natural cleavage planes favored the detachment of blocks along regular (upper and lower) surfaces. This also made it possible to obtain slabs for the floors and roofs. Bricks are absent: their use is limited to the last phases of attendance, for punctual repairs. The total absence of limestone formations has influenced the production of mortars, with the use of a clayey earth binder and an aggregate obtained from the fragmentation of the sandstone. Chestnut wood was used for the beams of floors and roofs and for the internal architraves of the openings.

### The construction systems

The construction systems were analyzed on the basis of four categories: 1) vertical elements: foundations and masonry; 2) horizontal elements: floors, roofs and vaults; 3) elements of discontinuity of the masonry: openings, arches and corner solutions; 4) other architectural elements and recurring devices (ovens, fireplaces, etc.). The identification of standard construction procedures, for each of these groups, made it possible to isolate, through stratigraphic investigations, specific anomalies due to subsequent modifications. In most cases the vertical wall structures rest directly on the rocky substrate, suitably shaped. All the walls have a conglomerate core made of earth and stone scraps. There are three main types of masonry works, each with its own variants, determined by the level of accuracy and size of the elements. The best one has regularized blocks, arranged on basically horizontal rows with frequent splitting and a limited use of fragments (Figure 9). The corners are in large square blocks well clamped to the walls. The joints have a thickness between 1 and 4 cm.<sup>13</sup> There are sporadic horizontals which, however, rarely run along the entire wall. In this type of wall there are rare diatonic elements for the connection of the two curtains. The second masonry type is less accurate, consisting of irregular stones, slabs and fragments, with abundant mortar, to reach horizontal rows. In the third type, stone slabs prevails in dense, split horizontal rows. The floors consist of one or two main beams (about 20 x 30 cm) embedded in the walls, on which 10-12 cm side joists rest. The space between joists (about 50 cm) was covered with large sandstone slabs (6-7 cm thick), which formed the flooring of the upper level. The roofs followed a similar procedure with a ridge beam on which secondary beams and joists rested, all embedded in the perimeter walls, without reducing the horizontal thrust.

<sup>12</sup> A fundamental reference for the study of the traces of working tools is the Bessac's work (Bessac 1986).

<sup>13</sup> Masonry works were analyzed according to the methodology of Fiengo 2003.



↑  
**Fig. 8**  
 Typological  
 catalogue of the  
 windows.

→  
**Fig. 9**  
 Earthen binder  
 mortar (on the  
 left), oblique  
 traces left by a  
 pointed chisel on  
 a jamb (center),  
 sample of a type  
 1 masonry (on the  
 right).

### The degradation processes. Dynamics and causes

All the buildings in Prataleccia are in a state of ruin, except two still in use. The weathering of the materials is diversified: the wooden elements undergo deformations and rot; the stone shows widespread phenomena of exfoliation and erosion. However, the main intrinsic criticality of these artifacts is the vulnerability of the earth mortars. Over the years, exposure to atmospheric agents has led to the collapse of roofs and floors. The wall structures undergo water infiltrations on the top which, combined with dry-wet cycles and thermoclasticism due to solar radiation, dissolve the mortars.<sup>14</sup> The action of weed vegetation on the exposed walls sections is significant. In addition to herbaceous plants (*Parietaria Officinalis*), there is a strong presence of shrubs (*Rubus Ulmifolius*, *Clematis Vitalba*, *Acer monspessulanum*, *Robinia Pseudoacacia*) whose roots penetrate the walls.<sup>15</sup> The prevailing strong winds, in addition to the erosion of stone materials, can

<sup>14</sup> A reference study is the manual of Luigi Marino for the identification of pathologies in archaeological areas and ruined buildings (Marino 2016).

<sup>15</sup> A useful contribution to the knowledge of the risk caused by the vascular plants is that of M. A. Signorini who



compromise the tightness of the most unstable walls (Fig. 10). Other degenerative mechanisms are due to structural instability. The most vulnerable parts are the partition walls released at the sides and at the top, due to the collapse of floors, roofs or flues inside the thickness of the wall. The stone lintels are frequently damaged and the bending of the wooden ones causes the collapse of the masonry above. The thrust of the ground and the action of roots cause deformations that can lead to the expulsion of material.<sup>16</sup>

### Conclusions and perspectives

The results of the survey offer a fairly clear preliminary knowledge picture that can guide future research developments. Among the short-term objectives there are in-depth studies (instrumental and analytical) on the stability of the wall structures, starting with geophysical investigations to assess the presence of internal voids. The characterization of stone and mortar by lab tests will facilitate the interpretation of decay processes and the evaluation of intervention strategies. Risk assessment models will be developed for the whole complex, which take into account the main factors involved (vulnerability, exposure, speed of phenomena, etc.), to establish hierarchies of possible conservation actions.<sup>17</sup> In the long term, the research aims at defining guidelines for sustainable recovery on two levels: that of the definition of an adequate housing model and that of direct interventions on the buildings. Since its origins, the village of Pratalecchia has based its existence on the balance between anthropogenic

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classified them by the danger of their roots for the masonry structures. (Caneva 2007, pp. 87-96).

<sup>16</sup> The study of the construction phases can be useful for evaluating the structural efficiency of buildings and understanding the dynamics of instability. In fact, the modifications of a building model may have introduced elements of discontinuity or weakening of the wall structures.

<sup>17</sup> This important phase of the further investigations will be developed according to the approach proposed by the Manual of Risk Assessment of Cultural Heritage of ICCROM (Michalski 2016).





↑  
**Fig. 10**  
Different  
degeneration  
processes.

activities and landscape maintenance with minimal environmental impact. This relationship must be the foundation of any concrete hypothesis of sustainable recovery. Starting from the management of the chestnut groves, an agricultural dimension integrated with the biodiversity of the area could be the starting point of a stable presence in which the needs emerging from the recent post-pandemic scenarios can also converge. This could be accompanied by periodic attendance with the provision of accommodation facilities to support hiking and study activities. In a sustainable perspective of reintegration, it will be essential to stimulate paths of re-appropriation of collective memory and contact with the territory with the local community. Conservation interventions and new architectural insertions must be conceived following two directions: cultural attitudes to safeguard the witness values that have emerged (formal, technical, spatial, etc.); technical attitudes (conservation and consolidation of remains, seismic and energy improvement). In this dimension, the great potential of the site's alternative energy resources (sun, wind) can make a decisive contribution.

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**Lamia Hadda**, PhD et professeur agrégé en Histoire de l'architecture à l'Université de Florence, Département d'Architecture. Elle enseigne Culture Euro-Med à l'École EuroMed d'Architecture, de Design et d'Urbanisme de l'Université Euro-méditerranéenne de Fès-Maroc. Membre du collège doctoral en Architecture et membre du laboratoire Dar|Med.

**Saverio Mecca**, Architecte et professeur en Production de bâtiments à l'Université de Florence, Département d'architecture. Membre du Conseil exécutif de l'ISTEA et du Comité scientifique international sur le patrimoine architectural en terre ISCEAH-ICOMOS. Directeur du laboratoire Dar|Med du Département d'architecture.

**Giovanni Pancani**, Architecte et PhD, professeur agrégé de Relevé architectural à l'Université de Florence, Département d'Architecture. Il s'occupe des protocoles de certification des relevés par scanner laser et de la valorisation et conservation du patrimoine culturel de l'architecture méditerranéenne.

**Massimo Carta**, Architecte et PhD, professeur agrégé en Urbanisme à l'Université de Florence, Département d'architecture. Il enseigne Urbanisme à l'École EuroMed d'Architecture, de Design et d'Urbanisme de l'Université Euro-méditerranéenne de Fès-Maroc et à l'UNSBC de Tirana (Albanie).

**Fabio Fratini**, Chercheur du CNR-ISPC, Institut des Sciences du Patrimoine Culturel. Son activité de recherche porte sur l'archéométrie des matériaux utilisés dans l'architecture monumentale et vernaculaire et sur l'étude de dégradation finalisé à la conservation du patrimoine. Il est membre du Comité Permanent du RIPAM.

**Stefano Galassi**, Architecte et PhD, chercheur en Sciences du bâtiment à l'Université de Florence, Département d'architecture. Il enseigne Mécanique des structures à l'École EuroMed d'Architecture, de Design et d'Urbanisme de l'Université Euro-méditerranéenne de Fès-Maroc. Membre du collège doctoral en Architecture et membre du laboratoire Dar|Med.

**Daniela Pittaluga**, Professeur agrégé de restauration à l'Université de Gênes et responsable scientifique des projets de recherche. Membre et réviseur du comité scientifique des séries éditoriales, des revues nationales et internationales et membre du comité permanent du RIPAM.

Villages et quartiers à risque d'abandon sont aujourd'hui une problématique commune à des nombreuses régions de la Méditerranée, considérée comme un point stratégique dans les nouvelles politiques européennes. L'abandon progressif des zones internes est une constante dans les pays caractérisés par le sous-développement économique, avec les phénomènes d'émigration et de fragmentation du patrimoine culturel. Cela entraîne des problèmes d'architecture et de gestion du territoire. L'objectif principal de ce travail de recherche est de créer un espace de discussion qui comprend l'étude du patrimoine architectural et du paysage ainsi que les témoignages démo-ethno-anthropologiques.