versus

VERSUS
HERITAGE FOR TOMORROW

Vernacular Knowledge for Sustainable Architecture

edited by
Mariana Correia
Letizia Dipasquale
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This scientific publication resulted from an intensive and significant teamwork research, based on the common main aim of establishing key principles, regarding vernacular knowledge and its contribution for sustainable development.

Lessons learned from vernacular heritage are systematised through principles that define a wide number of strategies to consider and to integrate for sustainable contemporary architecture. This was possible through the initial establishment of operational definitions, regarding vernacular architecture and sustainable architecture. It was also critical to define a profound reflection concerning the state of the art of environmental, socio-cultural and socio-economic sustainability, as well as resilient vernacular heritage, and the definition of parameters for vernacular sustainability during the 20th Century.

This publication presents the design of the VerSus research method and operative approach, which were decisive for the systematisation of strategies and solutions identified in urban, local, architectural, technical and constructive terms. Each area of study was represented by specific case studies from Europe and around the world, addressing vernacular environments and contemporary contexts.

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Vernacular Heritage Sustainable Architecture
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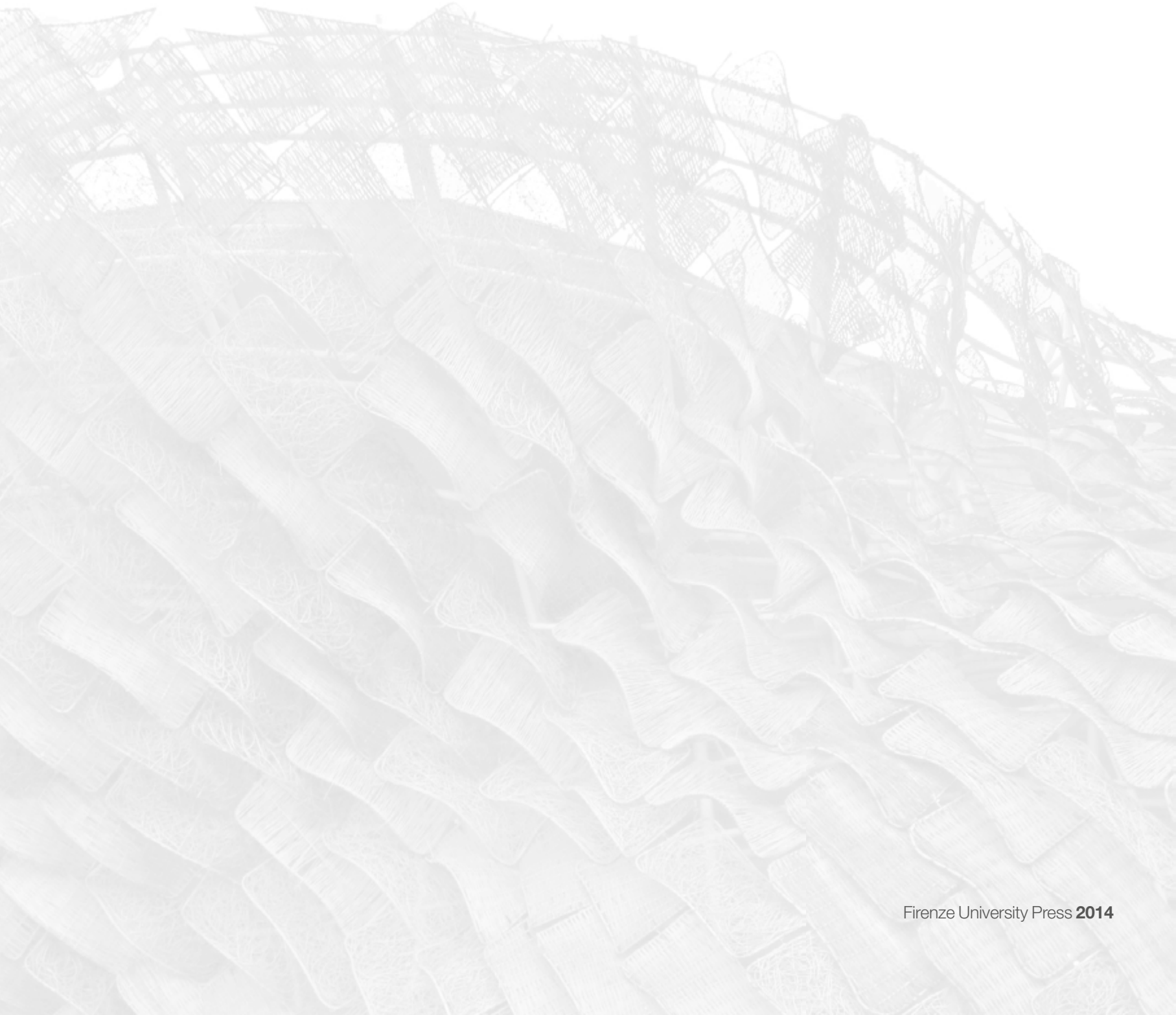

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Corbelled Domes dwelling near Aleppo, Syria,
(photo: S. Mecca)

Mosque in Mopti, Mali
(photo: M. Correia)

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Technical and constructive strategies and solutions

Socio-cultural resilience; *lakou* layout in post-disaster tent encampments, Haiti (photo: United Nations Development Program).

Resilience of vernacular architecture

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"It is not the strongest or the most intelligent who will survive but those who can best manage change". **Charles Darwin (*The Origin of Species*, 1859)**

In recent years the evidence of human-initiated climate change has already began to transform human habitats. The most pronounced changes occur in cities under the negative outcomes of rapid urbanisation, consumption of natural resources and demographic changes. Mitigating the impacts of changing environmental conditions is one of the major urban challenges of today's cities. In this context resilience has been introduced in the field of urban planning and architecture as an integral concept for increasing the ability of adaptation of human settlements in the face of changes.

The notion of 'resilience' in urban science, describes the capacity of human habitats to absorb shocks and perturbations without undergoing major alterations in its functional, physical, social and economic systems. A crucial feature of a resilient urban system is having the ability to survive the potential risks and threats as well as taking advantage of the positive outcomes that the disturbances bring. Vernacular architecture, which is in continuous evolution, constitutes a substantial research field with its immense adapting capacity to the changing external circumstances. The understanding of resilience sees the environment in constant transformation; therefore resilient architecture presupposes a dynamic architecture, which is primarily characterised by *flexibility* and *adaptability*. In this case, vernacular architecture, which includes in its origins a series of responses to the changing dynamic factors such as micro-climate, local materials and local living cultures, can meet the requirements of resilience.

What is resilience?

The word resilience was first used as a term in psychology in the 1950s to describe the tolerance abilities of children. The term was also used within a conglomerate of qualities that allow people to remain psychologically balanced and mentally healthy in the presence of negative life circumstances and crises (Petzold et al., 2002).

Subsequently the term 'resilience' has gained significance in different disciplines and scientific contexts (Burkner, 2010): from approaches to human ecology and taxonomy to studies on developing countries. The resilience of an ecosystem has firstly defined by Hollings (1973) as "the capacity of an ecosystem to tolerate disturbance without collapsing into a qualitatively different state that is controlled by a different set of processes" (Van et al., 2012, p. 310). Hollings also underlined the fact that a resilient ecosystem can withstand shocks and rebuild itself when necessary. The Resilience Alliance (2002) further define the characteristics of resilience in natural environment, which can also be used as a measuring system of the resilience of an ecosystem. These characteristics refer mainly to the amount of change that the system can endure under crisis, the level of self-organization capacity of the system and the ability of a system to adapt itself to the new conditions and learn from the experienced disturbances.

In 2007, Ward described resilience stating: "change is constant and unpredictable in a complex and dynamic world" (Ward, 2007). Afterwards, two definitions which specifically relate to urban resilience have been formulated: the first one belongs to Walker (2004) who defines resilience in these words: "resilience is a capacity of a system to absorb disturbance and reorganize itself while undergoing change, so as to still remain essentially the same function, structure, identity and feedbacks". A second, similar definition, in terms of urban resilience, was given by the 'Resilience Alliance' (2002) who defined it as "the ability to absorb disturbances to be changed and then to re-organise and still have the same identity (retain the same basic structure and ways of functioning)"[1]. This definition further emphasizes the ability of a resilient system to learn from disturbances and crisis.

In the framework of 'sustainability', which deals with the scarcity of natural resources and economic crisis, 'resilience' emerges as a 'complementary' key approach in urban planning and architec-

[1] The notion of resilience is defined here by the 'Resilience Alliance' as a series of key concepts, available at www.resalliance.org/index.php/key_concepts.

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Fig. 1 Resilience through local construction systems. Traditional timber framed houses of Nias Island, Sumatra, Indonesia (photo: Ouicoude).

ture. The relation between 'sustainability' and 'resilience' has been discussed in the Resilient Communities and Cities Partnership Program (ICLEI) in 2004: "How can a city be truly 'sustainable' if it lacks the capacity to reduce vulnerability to crisis and to respond creatively to change? This essential capacity can be described as 'local resilience'. Therefore, a new agenda must be introduced in the sustainable cities movement. A sustainable city must be a resilient city. a sustainable community must be a resilient community" (Otto-Zimmermann,2012, p.3). According to this consideration, a sustainable city must also have the ability to respond to environmental shocks and reduce its 'vulnerabilities' beyond simply optimizing its energy requirements. In comparison with the concept of 'sustainability', 'resilience' is a more dynamic notion as it refers to 'transformation', 'flexibility' and 'adaptation' of the systems through changing circumstances while 'sustainability' is mostly concerned with sustaining the 'stability' without requiring re-adaptation. However resilience seems to have an opposite sense in this respect to sustainability, and although they both focus on maintaining the system's *equilibrium*, they do it in different ways.

A human habitat can be truly sustainable only if it can manage to establish a balance between the changing conditions while maintaining its indigenous characteristics by rebuilding new systems in order to respond to forthcoming changes. The features of a sustainable habitat substantially coincide with the requirements of a resilient system in environmental, socio-cultural and socio-economic terms. Therefore the two concepts, 'sustainability' and 'resilience', are inseparable and vital for the survival of human settlements in changing environments. Responding to the requirements of both sustainability and resilience will strengthen our cities in the face of forthcoming climatic, environmental, socio-cultural and socio-economic changes.

Role of indigenous cultures in the context of resilience

The close relationship between vernacular architecture and resilience was first noticed in the definition by Paul Oliver (1997): "vernacular dwellings and buildings are related to their environmental context and available resources, they are customarily owner or community built, utilizing traditional technologies. All forms of vernacular architecture are built to meet specific needs, accommodating the values, economies and ways of living of the cultures that produce them". Oliver's description points out the existence of numerous parameters in the constitution of a local building culture, above all the role of the 'micro-climate' and various environmental conditions. Therefore, indigenous knowledge and vernacular culture become very specific and localized and can represent the specific responses given in the pre-industrialization age by human beings to environmental, socio-cultural and economic challenges by processing available natural resources for their survival.

Indigenous knowledge refers to the methods and experiences selected and established by local communities from a progressive understanding of the local resources, constraints, values and risks over the years. The most relevant character of indigenous knowledge, which distinguishes it from other categories of culture, is that of being diffused informally and developed/transmitted collectively over generations: accumulated practices have not been experimented in a systematic and scientific way over the years, since they are mostly a series of social and shared values that are transmitted from one generation to the next. Looking for sustainable design paths for future architecture and human settlements, we can rely on past findings for developing resilient planning strategies, analysing, selecting, testing and verifying the intangible heritage of vernacular archi-

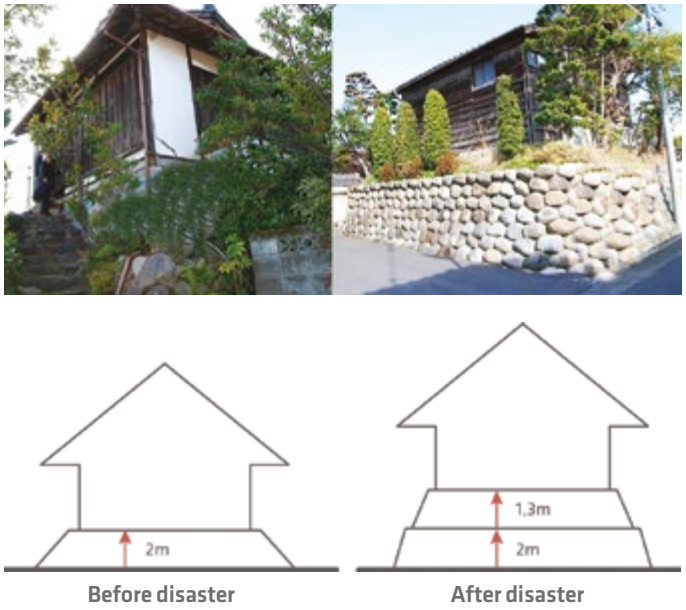

Fig. 2
Initially, *mizuya* was built as a storage room to protect household assets. When a severe flood disaster occurred in 1896, the *mizuya*'s plinth height was only 2 m. After the flood destroyed *mizuya*, the householders reconstructed it by raising the plinth level 1.3 m higher than the previous level. Gifu, Japan (photo: NIED-KU, 2007 after Shaw et al. 2008).

tecture. In this way the heritage of vernacular architecture can provide a rich field of research concerned with developing new strategies of resilience, meant as the shock-absorbing capacity of systems aiming towards sustainability in a world of changes and transformations (Berkes, 2004).

Vernacular architecture heritage is characterized by three specific factors that are relevant for resilience:

- interaction with climate change and changing socio-cultural conditions;
- interaction with a certain environment after a certain time frame;
- being a socially shared knowledge.

Vernacular building culture has been established through centuries by many civilizations across the world through a process of trial and error. Accordingly, vernacular architecture is in a continuous evolution and shows different features and shapes which are based upon local climatic conditions, materials and living cultures.

In a given society, the existence of a local culture implies a favourable development of awareness that arises from diffused cultures. Indigenous knowledge plays an important role in the way communities deal with crises, disasters and profound changes. In this case the concept of 'resilience' becomes important for developing an approach to adaptation through a series of strategies by which the inhabitants use available resources to cope with adverse conditions that can occur due to the disasters. Resilience attributes to an ecosystem the ability to repair damages after a disaster, as well as to absorb impacts and manage emergencies together with the capacity to adapt and innovate in socio-territorial organization. Strengthening the resilience enables communities to develop a great capacity to mitigate the effects of natural hazards.

Traditional knowledge, which is achieved through experiences and intergenerational transmission, strengthens social-ecological systems as a result of its ability to deal with complexity and uncertainty (Berkes et al., 2000). Therefore it is natural to assume that indigenous knowledge is a source of resilience as has been proven for example in the case of Nias Island in 2004 when it was hit by a series of earthquakes which caused the death of 900 people (fig. 1).

The local building culture of the Nias Island has demonstrated an outstanding capacity to withstand strong seismic shocks. While 80% of the 'western style' concrete buildings, which were mainly built under the influence of 'modernism', collapsed, few of the vernacular buildings were damaged and ultimately caused less harm to the inhabitants due to the relative lightness of the wooden structures. In the indigenous culture of Nias, appropriate construction systems have been developed over years that adapt to the specific environmental conditions.

Indigenous knowledge has been proven also in the field of flood mitigation in Japan, in the flood-prone Gifu region. This experience elucidates the fact that when the traditional knowledge is well integrated with the technological systems, it facilitates handling catastrophic events in a better way. In Gifu, a dynamic strategy has been developed by building additional elevated houses called *mizuya* (fig. 2). Commonly the families build *mizuya* next to their main houses where they keep household assets. In the case of flood, *mizuya* serves as a protection room from the rising water level. Inhabitants of these houses are continuously adapting their *mizuya* to the changing flood level; when the water level tends to exceed the plinth level, *mizuya* can be reconstructed by raising its height to adapt it to future floods.

Vernacular building culture has a close relationship with environmental factors and is conscious of the fact that natural changes and alterations are normal and nothing new; in many cases vernacular architecture of a specific site is the result of a selection of an architectural culture which is able to prevent changes (mostly climatic, but also social and cultural) and to mitigate their consequences and effects in order to adapt itself to the new established conditions.

The building principles of vernacular architecture incorporate var-

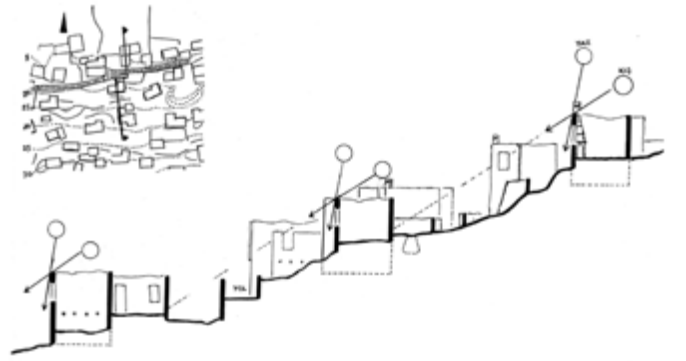

Fig. 3 General view of Kayaköy village, province of Mugla, Turkey (photo: P. Kısa Ovalı).
Fig. 4 Section of the settlement morphology of Kayaköy village, province of Mugla, Turkey (credits: P. Kısa Ovalı).
Fig. 5 Streets of Kayaköy village as a drainage system, province of Mugla, Turkey (photo: P. Kısa Ovalı).

ious strategies to enhance resilience through three main actions: *prevention*, *resistance* and *adaptation*. While *prevention* and *resistance* are related to the management of risks and threats, *adaptation* concerns itself with the recovery capabilities of an ecosystem after shocks and disturbances which in our case are changing circumstances. Adaptive capacity relates to the preconditions that enable actions and adjustments in response to changes in order to establish a new state of equilibrium within current post-change conditions.

Environmental dimensions of resilience in vernacular architecture

Environmental resilience reflects the effectiveness and capacity of an ecosystem to deal with changing environmental conditions by reducing its physical vulnerabilities. The degree of a community's vulnerability depends on its physical exposure to natural hazards and on its capacity to absorb the negative effects of changes and re-organise itself.

In pre-industrial societies, climatic variability and the uncertain presence of water and other resources lead local communities to develop adaptive practices in order to respond to variability and change, making up in this way for the lack of modern technology, transports, and global market economy. Therefore traditional knowledge played a central role in responding to environmental crises: through processes of trial and error, practices and institutions have been developed to cope with changes and unpredictable events (Gómez-Baggethun et al., 2012).

The preconditions of environmental resilience are enhanced through three stages of strategies related to *pre-crisis* and *post-crisis*.

- Strategies of *prevention* of environmental crises enable communities to interact with environmental changes of a specific site in order to avoid or reduce risks and threats. These strategies consist of several actions such as: land use management, assuring appropriate choice of site, considering the hydrography of the place and the management of water resources, comprehension of meteorological and biological systems, use of locally available materials, and considering the specific characteristics of local risks;
- Strategies for building *resistance* to environmental crises are based on the use of climate-adapted and durable materials, appropriate architectural and structural conformation (in terms of seismic resistance) and natural hazard management.
- Strategies of *adaptation* to post-crisis conditions are concerned with the flexibility of design, the sharing of building cultures and the development of self-construction systems in order to facilitate fast recovery after natural disasters.

The most prevalent indicators of an adequate coexistence with environmental conditions are: the settlement morphology, the spatial layout of vernacular buildings and their relation with natu-

Fig. 6 Interior views of the courtyards in Tissergat and in Chefchaouen, Morocco (photo: L. Dipasquale).
Fig. 7 Patio with its reduced dimensions work as a filter during sand storms. The Ksar of Tissergat, Draa Valley, Morocco (photo: B. Aguilar).
Fig 8-9 Internal view of a patio in Tissergat, Draa Valley, Morocco (photos: L. Dipasquale).

ral resources. As it is seen in the case of Kayaköy, a former Anatolian-Greek settlement situated in the South-west of Turkey, a virtuous land use strategy has been developed. Kayaköy and other five neighbour settlements are founded on the slopes that surround the unique cultivable lowland of the region, which is situated 62 meters below (fig. 3). The choice of settling on the slopes and leaving the plain area for farming activities demonstrates the presence of environmental knowledge that is accumulated over the years (Kısa Ovalı, 2009). Placing the settlement on the high levels helps also to protect it from floods. In Kayaköy, all streets are planned in such a way that they could act as a drainage system by working as water canals in order to discharge excessive rain water down to the lowland (Kısa Ovalı, 2009) (fig. 4-5).

In terms of adaptation to the changing external temperature of daily and seasonal cycles, specific strategies have been developed related to the specific features of the site such as water collecting systems, natural ventilation, passive heating and cooling systems. In this context, a winning morphological model, adopted in all the Mediterranean area, which provides resilience against changing extreme climate conditions, is the 'courtyard house' (fig. 6-7): the central courtyard acts in the night as a natural cooling and ventilation system thanks to the air convention property that is based upon the principle of rising of warm air which is replaced by cool air. In addition to the chimney effect of the courtyard, the thermal inertia of the walls of the courtyard house contributes considerably to keeping the interior spaces cool. Whereas in the evening time the air of the *patio*, which has been heated directly by the sun and indirectly by the walls, rises up while nocturnal cool air gradually replaces it (Aguilar et al., 2013). According to this case it is clear that the adaptation is achieved through the courtyard, which has a shifting function according to the daily changing climatic conditions in order to provide indoor comfort in a totally passive and ecological way. The formal features of the courtyard show diversities according to the specific climatic conditions and living cultures; in desert areas, the courtyard presents very reduced dimensions in order to function as a filter during sand storms (fig. 8-9), while in warm and cold climate areas the courtyard has an extensive shape to capture more sunlight. As seen in both cases, the courtyard with its locally adapted design provides resilience against changing extreme conditions.

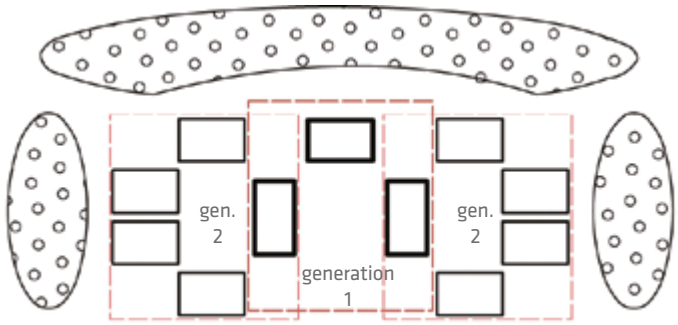

Fig. 10 Organization scheme of traditional dwellings according to 'Lakou' culture (credits: J. Miller).
Fig. 11 Proximity of cultivation terraces to the dwellings. The vineyards in Corniglia, region of Liguria, Italy (photo: B. Özel).
Fig. 12 Close relationship between the living and production areas. Traditional dwellings in Greve in Chianti, Tuscany, Italy (photo: B. Özel).

Socio-cultural dimensions of resilience in vernacular communities

The socio-cultural dimensions of vernacular heritage include intangible values such as beliefs, social behaviours, knowledge, building cultures and social cohesion that give the communities their identities. Consequently socio-cultural identities play a crucial role in terms of reducing vulnerabilities and strengthening the resilience of the communities: indigenous culture is important since it includes the knowledge of management of the territory in an appropriate way, which is indispensable to prevent natural disasters.

Socio-cultural resilience is acquired through three stages of strategies that regard *pre-crisis* and *post-crisis* phases.

- Socio-cultural strategies for crisis *prevention*, which aim to avoid risks and reduce social vulnerabilities by using local living cultures and traditions, consist of understanding the value of the place and its dynamics and disseminating local knowledge regarding practices and actions to cope with disruptions.
- Socio-cultural *resistance* is achieved through various strategies such as: community preparation for emergency, knowledge of alerting systems, strengthening the network of relationships and trust, facilitating the participation of local communities in decision-making and constructive processes, transmitting cultural values and history, ascribing value to the development of collective welfare, building common infrastructures and shared spaces, as well as integrating new technologies to indigenous cultures.
- Socio-cultural *adaptation* to post-crisis conditions is concerned with strategies based on sharing activities such as: swapping know-how on change management, maintaining the psychological health of communities, activating mutual reciprocal actions and sharing of wealth, food, labour and knowledge, sharing early warning systems, planning and activating mobility of people or goods according to climatic changes, and incorporating strategies for fast post-disaster recovery including temporary structures.

There are many practices for the oral transmission of knowledge regarding change adaptation: tales, songs and proverbs were used to store the collective memory of communities (Gómez-Baggethun, 2012). The transmission of living cultures from generation to generation and an increase in the acknowledgement of basic needs such as agriculture, or construction cultures (the so-called 'know-how') makes communities capable of recovering their living systems in case of perturbations.

The identity inherent in the cultural heritage also helps survivors to recover from the negative psychological impacts of disasters. The evidence of the power of socio-cultural values on post disaster recovery has been seen in Haiti after the devastating earthquake in 2010. The *lakou*, which historically means a large extended family, headed by the oldest male and grouped spatially in a cluster of houses, represents the space where a family grows and socializes by creating nucleus of urban texture (fig. 10). More than a pattern of set-

Fig. 13 Traditional *hórreo* in Galicia, Spain (photo: B. Juvanec).

Fig. 14 Typical nort-west Asturian *hórreo*, Spain (photo: R. Piñeiro).

Fig. 15 The 'serender', typical granaries in the Black Sea Region of Turkey (photo: R. Jackson).

tlement, the clustering symbolizes the family's unity and solidarity against the challenges of maintaining the property (Miller, 2012). The *lakou* culture also develops a social structure through reciprocal food sharing and helping each other in difficult times and during work. It is really interesting that the Haitians created a *lakou* layout in post-disaster tent encampments, which were supposed to be temporary settlements. According to the observation of researchers, most people do not want to leave their temporary settlements and have established a sense of community in their current environment (Miller, 2012). As mentioned previously, the notion of 'resilience' means not only surviving crises and perturbations but also re-establishing equilibrium through adaptation to the post-disaster conditions. Therefore in the terms of resilience, the culture of *lakou* works and helps to maintain the psychological health and vibrancy of the community.

Socio-economic dimensions of resilience in vernacular settlements

The economy of vernacular settlements is closely linked to the environment, or else to the locally available physical and human resources. Being based on natural conditions, the traditional productivity is closely influenced by the climatic and biological characteristics. Therefore the loss of a global economy makes the traditional productive activities strongly dependent on local changes. The linkage of economic and social welfare in local dimensions requires, for a good coexistence, a deep knowledge of seasonal cycles, natural disasters and social crisis management. Regarding building production, the participation of local communities in decision-making and in the productive process can reduce costs.

'Self-sufficiency' is the most essential precondition for a community to be socio-economically resilient. A 'self-sustaining' or 'self-sufficient' ecosystem has the capacity to maintain itself by independent effort without external support in case of crisis. In terms of urbanism, 'self-sufficiency' refers to the productive dimension of the cities which have the capacity of producing sufficient food, energy, building materials and services (Özel et al. 2014). The 'proximity' of productive areas to the dwellings, as well as shared cultivation and construction cultures, promotes the 'self-sufficiency' of vernacular settlements. Even when the land presents difficult morphological conditions, the 'proximity' of cultivated fields is ensured in creative ways, as can be seen in the Cinqueterre (Italy). The localities in this region are situated on top of hills, at a high of about 100 meters, and they are all surrounded by vineyards on terraces. The agricultural activities are managed thanks to the typical Ligurian terrace system (fig. 11).

The preconditions for socio-economic resilience regard three stages of strategies related to *pre-crisis* and *post-crisis* periods.

- Strategies for the *prevention* of socio-economic crises, which aim to avoid and reduce economic crisis and scarcity threats, consist of: using local and accessible resources, optimising the use of materials and promoting indigenous workmanship, selecting productions adapted to the local conditions, reinforcing local production of food, and including spaces for productive activities at housing scale.
- Strategies for building socio-economic *resistance* to crises based on sharing goods, integrating production, recognising the value of local products, transmitting production knowledge, enhancing local economy empowerment, promoting collective use of spaces, and transportation efforts.
- Strategies for developing socio-economic *adaptation* to the post-crisis economic conditions focuses on the storing and pooling

Fig. 16 Ice house in Monte Arcibessi, province of Ragusa, Sicily, Italy. (photo: S. Cultrera)

Tab. 1 Resilience approaches from vernacular heritage. (L. Dipasquale, S. Mecca, B. Özel)

of resources, sharing infrastructures and facilities, planning mobility according to human and physical resources availability, enhancing technical simplicity in building process, and optimizing construction efforts.

The food production and tending of livestock are part of daily activities, therefore vernacular houses are built in such a way that the production facilities can be included in the living areas (fig. 12). Vernacular dwellings are equipped with storages, domestic workshops, ovens and wells in order to carry out a series of productive activities in order to make the food accessible in all seasons. These spaces, especially the storages, have a major importance for achieving 'food security' as they are built to keep wheat and other essential substances for 'food production' during the difficult periods of the year with extreme climate conditions. The 'granaries' have particular architectural features, since they need to provide an appropriate structure in order to avoid humidity and the presence of rodents. The *hórreo*, the typical granary of the North-west of the Iberian Peninsula, is built in wood or stone, raised from the ground by pillars (fig. 13-14). The same is true in the Black Sea region of Turkey; the granaries, called *serender*, are a fundamental part of traditional houses (fig. 15). The *serender* shows the same morphological features as the *hórreo* since it is built on wooden pillars, raised from the ground for the same reasons. Storages show different features according to the needs. While 'granaries' are built raised on pillars, 'ice-houses', which act like a natural fridge to preserve food during the hot months, are built underground in order to offer more thermal insulation (fig. 16). As it is seen in both cases, indigenous people improved local cultures both by taking advantage of natural benefits and by protecting their socio-economic situation in the face of crises.

Resilience lessons from vernacular heritage for contemporary architecture

Strategies for resilience are intrinsic to traditional cultures. Moreover, they are highly reliable since they have had a long evolution over the years. Indigenous people have developed an immense knowledge, as well as useful disaster prevention strategies over generations thanks to the accumulated experiences of survivals during numerous crises; the experiences and lessons learned from previous disturbances have a crucial role in shaping resilient dwellings and habitats.

Today the traditional knowledge system is difficult to identify, since it is usually embedded in local cultures, rituals and symbols (Gomez-Baggethin, 2012), or else it is orally transmitted from generation to generation. Codifying this traditional knowledge that has not been registered in written form (material and immaterial heritage) could become a strategy to safeguard the heritage at risk, for example by identifying new solution for contemporary resilient architectures. A comprehensive inventory and multidisciplinary analysis of local resilient solutions could generate local practice codes, such as standards and quality controls, to be used for preventing, conserving and designing buildings (Dipasquale et al, 2011).

Practices of prevention and adaptation that come from vernacular architecture should be integrated with technological information and technical skills, in order to validate these practices as well as to educate the communities about potential hazard and risks. Participation of the community in decision-making regarding the site, building design, and construction details is decisive to consolidate their knowledge and sense of belonging and fellowship.

Local communities can reduce their vulnerability in the face of natural hazards and improve their resilience through locally managed and also small-scale mitigation activities; however, vulnerabilities can also be reduced through education, raising awareness, and fostering the conscious capacity of building and planning. These non-structural methods are often as important over the long term as structural mitigation, in a sustainable way of living.

PRE-CRISIS PHASE **PREVENTION + MITIGATION** APPROACHES	**CRISIS** PHASE **RESPONSE + RESISTANCE** APPROACHES	**POST-CRISIS** PHASE **RECOVERY + ADAPTATION** APPROACHES	
• Land use management • Assuring appropriate choice of site • Considering the hydrography of the place • Comprehension of meteorological and biological systems • Use of locally available materials • Considering the specific characteristics of local risks	• Use of climate-adapted and durable materials • Appropriate architectural and structural conformation • Natural hazard management	• Flexible design • Sharing of building cultures • Development of self-construction systems in order to facilitate fast recovery	**ENVIRONMENTAL**
• Recognising local living cultures and traditions • Understanding the value of the place and its dynamics • Disseminating local knowledge regarding practices and actions to cope with disruptions	• Knowledge of alerting systems • Strengthening the network of relationships and trust • Transmitting cultural values and history • Ascribing value to the development of collective welfare • Building common infrastructures and shared spaces	• Swapping know-how on change management • Maintaining the psychological health of communities • Activating mutual reciprocal actions and sharing of food, labour and knowledge • Incorporating strategies for fast post-disaster recovery including temporary structures	**SOCIO-CULTURAL**
• Using local and accessible resources • Optimising the use of materials and promoting indigenous workmanship • Selecting productions adapted to the local conditions • Reinforcing local production of food • including spaces for productive activities at domestic scale	• Sharing goods • Integrated production • Recognising the value of local products • Enhancing local economy empowerment • Promoting collective use of spaces	• Storing and pooling of resources • Sharing infrastructures and facilities • Planning mobility according to human and physical resources availability • Enhancing technical simplicity and self-building activities in building process • Optimizing construction efforts	**SOCIO-ECONOMIC**