

The vernacular as a model for sustainable design

A reflexion on vernacular architecture as an essential resource to enhance sustainable constructions.



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1 Introduction

André Corboz reflects in 1974, that one of the last active manifestation of spontaneous architecture today is that of slums and favelas. The term ‘spontaneous’ is coupled in the text with the term ‘popular’ and includes every built consequences of a population on a land. With a global modernization and industrialisation of housing all around the world, the marginalized peoples from the industrial civilization, the city dwellers rejected by a capitalist system, would have become the anonymous builders of a new vernacular architecture. (Corboz, 1974)

During the field studies in Metro Manila, occurring for the Urban Shelter architecture course at Lund University, the need of suitable shelter programmes to support the urban poor was highlighted. More than half a million of families live in slums areas in Metro Manila, many in danger areas, prone to floods or hurricanes, landslides and earthquakes. Those dense informal settlements are composed by non-permanent structures, mostly built up with waste materials and the lack of safe water and adequate sanitation are one of the everyday’s difficulties.

The challenge would be to identify in this popular architecture what will be useful to resolve the issues caused by urbanization and population growth (construction system, natural ventilation techniques, etc). The lack of resources in poor urban areas is a brake to creative solutions. By planning from below, consolidating and stabilizing this seemingly shapeless habitat, the slums could allow a sufficient self-management.

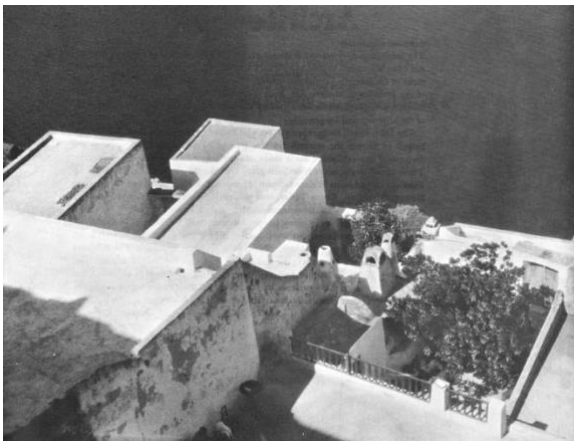
This paper aims to address the topic of traditional and vernacular architecture as a model for sustainable design and a powering tool to design habitat for the urban poor. We will first define the term ‘vernacular’ and its uses in the architectural tradition, and how our modern way of living has caused a progressive decline of traditional architecture. In the discussion section, the importance of an understanding of the heritage, the necessity of recognition and the need of documentation will be discussed as an essential prerequisite for developing future design. In order to highlight the process of research as a key resource and an untouched source of inspiration in the architect’s education, traditional Swiss graneries will be presented as an exemple of vernacular architecture. The last section will address the role of the architect and how vernacular architecture can contribute to benefit not only the architect but also the dwellers themselves.

2 Literature Review

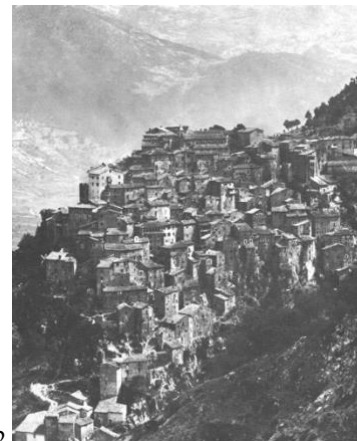
With the exhibition and publication of *Architecture without architect* at the MOMA in 1964, Bernard Rudofsky attempts to introduce to the visitor the ‘Non-Pedigreed Architecture’ and breaks down the narrow perceptions of vernacular architecture in the Western world, that ‘has never been concerned with more than a few select cultures’ (Rudofsky, 1964). Paul Oliver is another prominent pioneer of vernacular architecture who dedicated his career to make architects aware of the value and usefulness of ‘people’s architecture’ (Oliver, 1997), as a crucial way to produce more culturally appropriate contemporary design. In order to understand why this 1964 exhibit was controversial, it seems opportune to define this ‘non-pedigreed architecture’ and its position in the architectural culture.

A definition of vernacular architecture

In an article called *Spontane Architektur* published in *Archithese* in 1974, André Corboz treats how vernacular architecture has been defined and can be used today as an essential resource for modern design. This non-architect’s architecture has for long been hard to qualify. It comprises constructions made by local builders, using local materials and reflecting local environment and conditions. This spontaneous architecture is the expression of a life style, a tradition, and testifies of an ingenious respond to the necessity of solutions. It is the result of a program, a practice, a custom. Another fundamental characteristic highlighted by Bernard Rudofsky is that vernacular architecture is extremely site-specific and related to the context. « The untutored builders in space and time - the protagonists of this show - demonstrate an admirable talent for fitting their building into the natural surroundings. Indeed, instead of trying to « conquer » nature, as we do, they welcome the vagaries of climate and the challenge of topography. » (Rudofsky, 1964).



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Spontaneous, popular, vernacular, primitive, anonymous are various categories used through the time but seems to be opposed to a 'major' architecture. Pietro Belluschi defined traditional architecture as « a communal art, not produced by a few intellectuals or specialists but by the spontaneous and continuing activity of a whole people with a common heritage, acting under a community of experience. ». This last definition exacerbates a clear opposition between vernacular and 'scholarly' architecture, and can draw our attention towards the lack of research and studies held on traditional architecture.

Why has vernacular architecture been overlooked in traditional histories of design ?

A main reason advanced by Corboz is that the architectural culture has been more inclined to value symbols of the wealth and the established power. Since vernacular constructions cannot be classified in one specific style neither draw repetitive patterns, its varieties of materials or elements forms multiple factors that seems to elude our analytical tools. 'Vernacular architecture has never been homogenized, it can never be an international language, for it is rooted in places and their indigenous materials and patterns of life.' (Ward, 1996).

The use of certain building materials that would confer a fragile and vulnerable construction, in contrast with heavy stone masonry architecture, is a stereotype still recurring in the minds today. In a study conducted on traditional architecture in Zambia, the author reflects that 'traditional African buildings are often regarded as temporary structures thus not to be taken too seriously. In this context the term 'temporary' is often confused with 'primitive' and such 'makeshift' structures are not subjected to any form of scientific investigation.' (Schmetzer, 1995).

Movable structures and temporary shelters have been observed less and remain undervalued in our sedentary societies although those structures demonstrate ingenious and creative solutions. Discussing on nomadic architecture, historian Arthur Upham Pope complains that tents and pavilions, 'the magnificent structures that have been the pride of the monarchs of Western Asia for thousands of years, fabrications huge in size, very costly, and even if not permanent, often of extraordinary beauty' have never been seriously considered architecture by art historians. (Rudofsky, 1964). Depending on the climate, the settlement can be subjected to different hazards as flooding and therefore there is a need for changing

village site periodically along the year. Other structures are temporary shelters as they only need to last for one season, like fishing camps or refuge hut for hunting.



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his lack of general interest and adequate recognition for vernacular traditions is not only translated in the loss of precious resources and knowledge on building constructions but could also have amplified the gradual decrease of any forms of traditional architecture that occurred after World War II with the advent of mass-produced buildings.

Decline of vernacular architecture

The industrial revolution has caused a progressive decline of vernacular architecture wherever it has expanded. A modern house is a symbol of modernization, while the indigenous building culture has been devaluated. This has contributed to a process of deterioration of building and maintenance skills and thereby the quality of traditional housing. (Schmetzer, 1995).

The expansion of global trades enhanced the ready availability of new materials and technologies of construction. In some regions, the need of locally available materials and resources has decreased and the old architectural forms have become obsolete for a community that is undergoing rapid changes towards new lifestyles.

A decline of customs, traditional values and building technologies can then be observed since modernisation has radically transformed the house types, careless of the vernacular tradition. A greater reliance on modern mechanical systems has reduced the regional differences expressed in buildings based on climate. With the advent of mass-produced materials and housing, a global homogenization occurred, regardless of the climatic context of the site. It is possible to argue that only in

certain rural areas alive and intact vernacular architecture remains, even if the range of local material that is available for local builders has narrowed.

Around large cities a curious hybrid phenomenon of self-build with natural and industrial scrap materials has appeared, in the form of large slums or favelas. But in most of those constructions, any reference to local traditions is purely superficial.

3 Discussion & Urban Shelter Design

The exhibition made by Rudofsky has been a first glimpse in the process of public recognition of this vernacular heritage. However, Rudofsky's book contains only an assortment of pictures - destituted of any on-site studies - and can be perceived more as a romantic canvas englobing a large panel of vernacular exceptions rather than a scientific investigation. The *Encyclopedia of Vernacular Architecture of the World* edited in 1997 by Paul Oliver is a more nuanced and advanced research, composed by a first volume focused on theories and principles followed by two volumes applied to consider these principles within specific cultural and societal contexts. Paul Oliver's work remains a cited reference for vernacular heritage.

Vernacular as an infinite source of inspiration

Nowadays, it seems that vernacular architecture begins to receive the attention it deserves. Elaborate studies have appeared and the field of vernacular heritage has gained in importance and recognition. This renewed interest can be explained by many factors, ones that could have been engaged during the functionalist phase of the modernism movement.

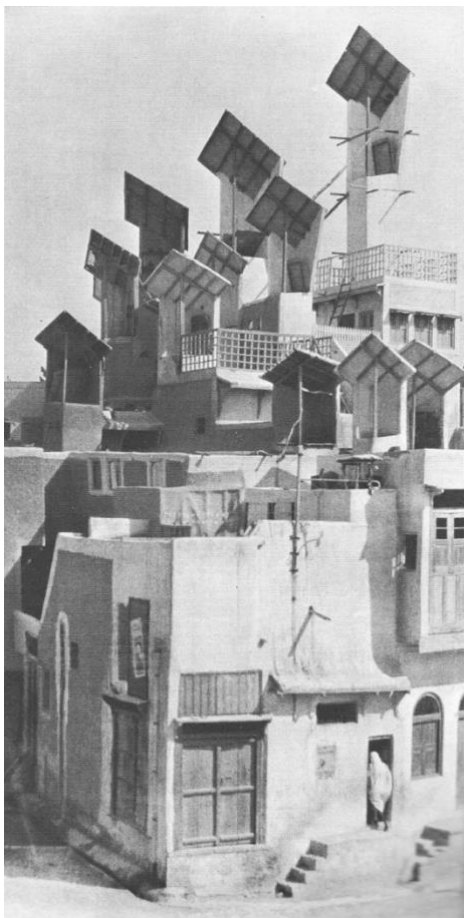
Maybe in response to a restricted and insufficient definition of architecture sketched by CIAM (Congrès international d'architecture modern) in 1945, a lot of architects have been looking into various type of vernacular architecture, that constituted one of the largest and untouched sources of inspiration. Today's architecture can somehow be seen as a perpetual recycle of same old patterns. Architects impose limitations on themselves by re-using, copying styles, historical forms or construction principles and become ensnared. Colin Ward evokes an alienation that exists between the designer, the maker, the product and the consumer. (Ward, 1996). One strategy adopted by some functionalist architects consists in unlearning its previous assumptions and seeking forward new forms architectural patterns. The

vernacular heritage appears then as a precious resource of knowledge and inspiration.

« The beauty of this architecture had long been dismissed as accidental, but today we should be able to recognize it as a result of rare good sense in the handling of practical problems. The shapes of the houses, sometimes transmitted through a hundred generations, seem eternally valid, like those of their tools. » (Rudofsky, 1964)

Vernacular and its sustainable lessons

A second factor could be due to the increasing and alarming pressure brought by the global environmental problems. Concerned by ecological and sustainable issues, more and more scientists and architects are embracing regionalism and the knowledge of traditional constructions, arguing that these structures are energy efficient and highly sustainable. We observe clear evidence of the increasing interest in vernacular architecture among the research community. Very fundamental lessons and principles on sustainability can be learned which



have an enormous potential to be applied nowadays at different scale. Traditional constructions are site-specific, adapted to the environmental and climatic context. Those structures constitutes adapted responses to topographic or seismic features and are built to resist to geographical hazards that may occur. In addition, through the use of local and natural materials, the components of this architecture are climate responsive and promote local economy since almost no materials are imported. The economical and social aspect is then an other characteristic that qualify vernacular building with cost-effective construction, no waste of materials, low environmental impact and therefore, a sustainable input.

Vernacular forms in contemporary society

A last reason to this renewed interest on vernacular heritage that will be discussed in this paper, concerns not only architects and ingeniors but also every craftsmen on buildings constructions. As vernacular constructions seduce more and more people under aesthetic considerations, it became in some regions important to reproduce modern piece of this architecture to satisfy a growing market. We will illustrate this by taking the example of swiss graneries. Although most of those alpine constructions were not made as living habitat, their rustic and traditional appearance fascinates today and leads to a high demand on the market. Many carpenter's workshops have then been specialized in the construction of traditional alpine graneries, mixing modern technologies and hand-made craftsmanship to assemble authentic structures. Local materials are again promoted in the region as well as traditional techniques have been rediscovered. Apart from the main traditional timber structure, additional features as insolation components, electrical devices or sanitation are added to ensure modern comfort.

In some cultures as in Japan or China, traditional temples made out of wood are dismantled and rebuilt according to ritual techniques and ancestral custom throughout the centuries. But this practice differ with the reconstruction process appeared in the Alps as the function of the authentic granary has changed and more seriously because those mountain structures are sometimes exported, dislocated in the plain, making its original assets obsolete, anecdotic, superficial.

As the original function for those modern alpine homes has evolved today, it can be discussed that such buildings are not as low-cost energy to produce and environmental responsive than the traditional graneries. But we can argue that it remains a satisfying compromise between a sustainable, climatic effective response and a contemporary construction that include any notions of modern living comfort. This renewed interest and the emergence of multiples studies and investigations on the field of the vernacular architectural heritage must continued and be promoted. However, vernacular architecture plays surprisingly a small part in architectural education.



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Vernacular and the architectural education

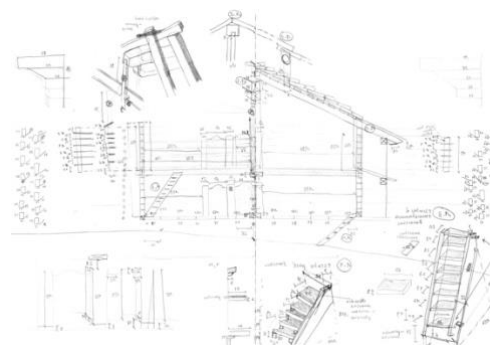
In the followed section, we will discuss the fundamental role in the education of architectural students that play the investigation of vernacular constructions. Many exercises such as architectural site surveys, structure analyses and practical in-site studies, are ideal opportunities to develop early-on fundamental architectural skills. By employing real vernacular buildings in context, the students investigate in a practical, experience-based learning environment.

We will illustrate those arguments by presenting a similar exercise occurred in an architectural course focused on the figuration of vernacular constructions at EPFL (Swiss Federal Institute of Technologie, Lausanne) and addressed to undergraduated students. The approach consisted in mesuring a vernacular building, both with technical drawings and a physical model, and involved many on-site surveys. Through the practical and difficult exercise of the architectural survey, students gains an in-death knowledge on the complex ways in which the building interact within its environment. Moreover, the technical redrawing of a ‘functional building’ leads the students to reflect on the relationship between architecture and craftsmanship culture. In other words, through drawing, the artisanal works of simple peasants are translated into architectural images and critical descriptions.

The architect’s analysis breaks down the alpine granary into prime factors such as orientation, protection from the elements, wooden technology, crop conservation etc. By developing a more sensitive approach of the architectural conception, it encourages the student to reflect on the use of responsive materials and construction methods and to think about passive and sustainable systems for future design.



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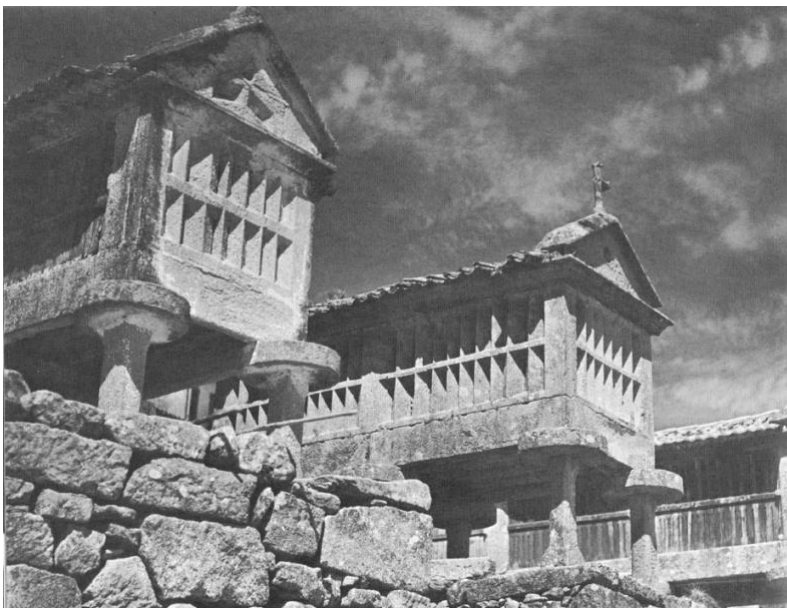
The on-site measuring is also the opportunity for the students to peel a relatively small structure and to understand its construction and functional principles, from foundations to the roof :

The alpine granary studied is divided into two different parts. The main load bearing structure is made by a wooden plank and isolated from the ground by saddle stones. To meet the slope, a retaining stone wall has been made to ensure a stable and flat basement.

The four cells that divide the inner volume serve not only to store crops, but also meat, drying fruit or cheese, and not rarely also documents, manuscripts and money. By lifting the building from the ground, the saddle stones protect the harvest against pests and rats. The snow is the most important load that will affect this mountain building. Therefore, the wooden squared framework is particularly stable, and carry heavy round stones that cover the roof.

Such exercise can also demonstrate to the student that many vernacular constructions seem suspended in time and almost universal. Built for eternity, granaries in northern rural Portugal - called *hórreos* - constituted another example for saddle stone architecture. « Put together from large granite slabs, a *hórreo* is fire- and vermin-proof. It rests on pillars topped by circular stones that act as rat-guards, and, incidentally, are the runners of the classical capital. Interstices in the walls serve for ventilation. » (Rudofsky, 1964).

Through this case study, we have identified one way in which vernacular architecture can contribute to the future of the built environment, through education, and serve as a model toward a more sensitive and sustainable architecture.



Vernacular as a sustainable model

As a last reflexion, we will discuss how the lessons learnt from vernacular architecture can enhance sustainable design and promote self-built constructions. Amos Rapoport suggests that vernacular studies moved on from ‘describing and documenting buildings’ to ‘the next “problem-oriented”, comparative, integrative and more conceptual/theoretical stage’. (Rapoport, 2006). One way of applying this suggestion is to formulate design criteria based on vernacular principles. The objective would not be to copy formal qualities that exist in traditional constructions but to identify and to derive more or less general lessons and principles by analysing vernacular environments. As mentioned previously, vernacular buildings offer lessons in response to climate, energy consumption and notions of environmental quality. One active strategy to apply those lessons might be to devise an ecologically sound pattern based on the rediscovery of constructional methods of controlling the internal environment of buildings. Charles Correa is one of those architects who used his understanding of traditional techniques through housing projects from the urban poor to the most wealthy. His work consisted in some ways to recover in the vernacular culture what would be useful to resolve housing problems inside a growing urbanisation. (Correa, 2000) Getting inspired by people’s architecture is an adequate and responsive attitude since this architecture has demonstrated ingenious and adaptive solutions.

« At the core [...] is the idea that people should design for themselves their own houses, streets and communities. This idea [...] comes simply from the observation that most of the wonderful places of the world were not made by architects but by the people.» (Alexander, 1978)

“From their worldwide experience the authors show that where dwellers are in control, their homes are better and cheaper than those built through government programmes or large corporations” (Ward, 1996)

Those two statements comfort a similar idea we had during our field studies in the Philippines and lead us to discuss the role that the dwellers themselves could play in the building process. An alternative to the building construction within an urban context would consist in developing a deeper relationship between the dwellers and the contractor. Such relationship must be translated by involving the dwellers, or

the community early-on in the building process. This investment must continue during and after the building construction. This tight collaboration can result in an optimization of the construction efforts, will promote local activities, save resources as well as reduce energy consumption and extend the building's lifetime as the community will value its work and ensure a suitable management. By bringing an adequate educational and social support, the vernacular knowledge could be a powerful tool and resource for the dwellers themselves to use. This rediscovery of the heritage could lead to increased self-help housing and achieve affordable, responsive and sustainable constructions.

5 The Role of Architects

Through the architectural history the imminent role of the architect as a keystone in the construction process has progressively decreased as many other actors are today involved in the building construction. Nevertheless, the architect remains an essential protagonist, acting as a supervisor and a bridge between the other trades. Developing a wide knowledge on the different building professions helps to better identify the issues that could occur and ensure a positive dialogue and understanding. Especially when dealing with a project not regulated or created by specialists but through a political system or any other organization, the architect must warn against abusive decisions and guarantee a positive social impact.

I also believe that an architect has an essential role to play in the housing struggle for the most insecure and must more frequently dedicate his understanding on handling practical problems to ensure affordable and sustainable habitats.

On an other topic, we can prevent the architect from being the only responsible of the project. This will of designing to the last single detail may lead to relegate the occupier of the building to the role of caretaker. However, as discussed earlier, participatory design is an effective way to ensure sustainable result inside a community. A responsive attitude toward better projects would be for the architect to act in a more flexible way, without deciding the meaning and expectations of the dwellers and let them the opportunity to enrich and value their own environment.

Another quality and lesson from vernacular heritage to consider for an architect concerns the re-use of existing buildings. As a consequence of the progressive change in our modern society and economy, many cultural buildings today suffer

of under-exploitation since their primary functions have become obsolete. To cite examples occurring in Western Europe, country churches, graneries, barns and farms may be abandoned and constitute for the owner an expensive cost to maintain. Since demolition can be perceived as a loss and a waste of heritage building and is very costly, a solution consists of adapting those unlikely buildings for new purposes. The rehabilitation of deficient buildings appears in my opinion to be a highly sustainable solution, but it involves an important engagement and knowledge on traditional construction techniques from the architect and the craftsmen to ensure a successful project.

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Images

1. Typical houses of the Mediterranean area, by Bernard Rudofsky and published in *Architecture Without Architects: A Short Introduction to Non-Pedigreed Architecture*.
2. Anticoli Corrado, in the Sabine Mountains near Rome, by Gabinetto Fotografico Nazionale and published in *Architecture Without Architects: A Short Introduction to Non-Pedigreed Architecture*
3. Morning day in Vietnam, by Peter Schmid and published in *Architecture Without Architects: A Short Introduction to Non-Pedigreed Architecture*
4. The air-conditioners Hyderabad Sind, by Dr. Martin Hürlimann and published in *Architecture Without Architects: A Short Introduction to Non-Pedigreed Architecture*
5. Modern saddle stone foundation for an alpine chalet, by Eliott Hounieu
6. Authentic saddle stone, by Eliott Hounieu
7. Wooden model of a swiss granary, by Eliott Hounieu
8. On site survey sketches, by Eliott Hounieu
9. 'Horréos' granaries in the Spanish province of Galicia, by José Ortiz Echagüe and published in *Architecture Without Architects: A Short Introduction to Non-Pedigreed Architecture*