

Implementing the lesson of early 20th century traditional buildings for a real sustainability. The examples of Corviale (Rome) and ZEN (Palermo) districts

Ettore Maria Mazzola¹

¹The University of Notre Dame School of Architecture Rome Global Gateway, Rome, Italy, emazzola@nd.edu

Topic: T4.1. Conservation and restoration projects of vernacular architecture

Abstract

The lesson of the early Italian 20th Century vernacular/traditional buildings and districts by ICP (Social Housing Institute), which were quickly and inexpensively built, suggests the right way to improve our cities while respecting the environment. Moreover, the socio-economic strategy of those days shows what we can do to re-train artisans and generate a vast artisanship, which could reduce the restoration costs of our heritage. As matter of fact that wise way of building aimed not only at providing new decorous houses, but also at generating labor and reducing the future maintenance costs. The success and durability of the buildings of those districts were not accidental: their authors' assessments, as well as the urban rules conceived on those days, show that everything was carefully planned of a great thanks to an interdisciplinary approach. The use of traditional masonry, that does not need to wait for the hardening times of concrete to be loaded, allowed the quick constructions of those buildings: for instance 6 months for 44 houses of the district San Saba and only 4 for the entire Lot 24 of the Garbatella. These traditional masonry houses, whose revalued building costs were roughly 50% less than current ones, have not needed to be restored for over 100 years and are among the most sought after houses in real estate, (€/sqm 11,000, like in the historical center). Furthermore, the wise construction policy of those days shows us how we can solve the problem of housing, earning public profits from it rather than increasing public debt. The cases studied in this paper regard the projects for the urban regeneration of two wretched suburbs, in Rome and Palermo. They both show how, thanks to the simple reuse of the pre-Fascist laws and tools, as well as of traditional masonry, we can achieve the above-mentioned program.

Keywords: wisdom; sustainability; durability; economy.

1. Introduction

As architects, engineers and restorers, we have been taught that the only way to solve the problem of housing is to build massive buildings, rigorously realized in reinforced concrete. In addition, it is a common belief that reinforced concrete and steel structures are more solid and durable. Finally, in our academic training, we all have been given instructions about the use of modern techniques, materials and technologies in the restoration of historical buildings and monuments. What we are told is that not only these modern solutions are

stronger than traditional ones, but they also help avoid the falsification of history. (Mazzola, 2004 and 2010). The consequences of this monistic way of forming new professionals are evident: the majority of new buildings and districts result depressive, depersonalizing and far away from any sense of belonging (see Davos assessment on buildings). Moreover, those buildings made of industrial materials and “light structures”, brought humans – for the first time in the whole history of architecture – to debate on a more sustainable way of building. (Neretti & Soma, 1982).

Furthermore, the lack of knowledge – or the lack of interest – both on pre-modern systems of dimensioning the structures and on their behavior, together with the theory of “*falsification of history*”, caused the loss of many historical buildings. Indeed, we can simply analyze the reasons of collapsing of many of the “*restored and strengthened*” historical buildings happened in the last three earthquakes in Italy, or the one of the *Schola Armaturarum* in Pompeii, to understand that some of our beliefs need to be revised. (H. Cruz, et al., 2016). The advent of functionalism, as well as the “*damnatio memoriae*” of traditional architecture, which started in the ‘30s of last century, brought to a separation of interests between a small group of professionals and workers of restoration (still interested on traditional masonry and buildings) and lots of designers and workers, specialized on modern structures and architecture.

The tragedy of this separation is not only the impoverishment and flattening of the architectural quality, but also the increase of the costs of the labor force in restoration, due to the lack of competitors. Moreover, the abandonment of traditional construction methods – especially before the Seventies – has generated millions of cubic meters of energy-intensive buildings, whose existence, according to the EEA’s data, is one of the main causes of global warming. (Neretti & Soma, 1982) (EEA 2010’s data on Environmental Impact and Production Sectors). Refusing to admit their responsibilities, now architects look interested for a more sustainable way of building and living ... often trying to *reinvent the wheel* in the name of the zeitgeist and the “*necessary experimentation*”, instead of looking at the past and finding that most of the answers are already under our eyes.

At the beginning of the Twentieth Century, the inhabitants of the Italian capital were exponentially growing and the city of Rome was in bankruptcy; the reason for the financial collapse was the illogical development of the city’s buildings, which saw the public administration as

a mere spectator of the massive private speculation. Once they understood the problem (thanks to the work of the first mayor – Ernesto Nathan – who was not related with the clergy, nor with the bankers), the public administration created a perfect machine to work in a healthy competition with the private investors, achieving great successes in terms of economy, architecture, urbanism and sociology. The activity of the *Institute for Public Housing*, the “*Unione Edilizia Nazionale*” and “*Istituto Centrale Edilizio*” for the construction of all the mix-income and mix-functions districts indeed brought the economy of the Commune back in positive; moreover, they created marvellous “green districts”, providing not only homes, but also jobs for the unemployed, i.e. life expectations for all those “*new Romans*”. Thanks to traditional masonry (the only modern solution were the shallow vaulted ceilings on iron beams, that do not need to wait for the hardening times of concrete to be loaded) these constructions were extremely fast: for instance, the first 44 houses of the district San Saba were started on October 1908 and already inhabited in April 1909. (Mazzola 2010; Briotti 1988).

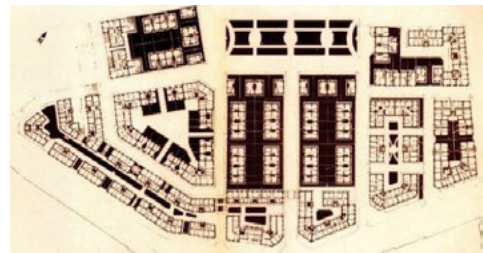


Fig. 1. Ground Floor Plan of the district San Saba in Rome.



Fig. 2. District San Saba in Rome – brick detail of cornice of one of first 44 houses built between October 1908 and April 1909.

These beautiful brick houses, whose revalued building costs are roughly 50% less than current ones, have never been restored in more than 100 years and are now considered among the most sought after in real estate, whose price is about €/sqm 11,000, like in the historical centre.



**Ater vende i suoi gioielli:
all'asta quattro villini a San
Saba**

Fig.3. News of September 20th 2020 – the auction average cost per apartment (90 sqm) is € 1 mln, i.e. €/mq 11,000.

The success and the durability of these buildings are not accidental. The architect wrote in 1911, in the Report enclosed with the *Concorso per il Progetto di un Tipo di Casa Popolare per Roma* (Architectural contest for a Type of Public Housing in Rome):

«Not only does the building "beautiful outside and clean inside" contribute to the upgrading of the classes living in it, but a proper use of durable materials, such as bricks and tiles, leads to a drop, over time, in maintenance costs, especially in buildings that have several storeys joined in a city block or district».

The great lesson of this wise way of building should be taken into consideration today for a more sustainable way of building. With this aim, we should think of new buildings based on traditional techniques, hence on durable materials that consume little energy. That means that the use of supporting walls will have to be encouraged, as well as arches and timber structures and floors made of shallow brick vaults on steel beams.

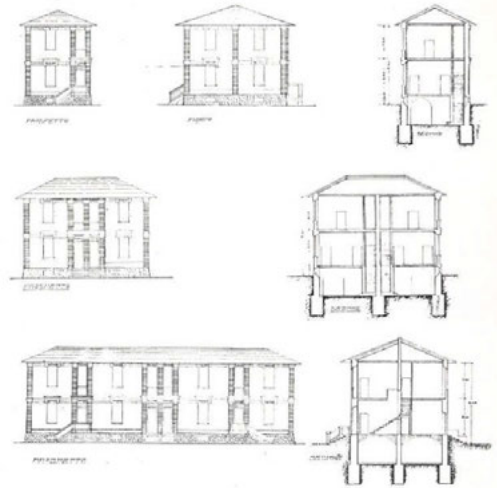


Fig.4. Elevations and sections of the first houses in San Saba.

All this will help speed up construction of buildings and reduce maintenance costs on the one hand, on the other; it will make possible the cutting of restoration costs for the existing constructions, thanks to the re-training of an extensive and specialized labor force that as such will be competitive.

Average costs "per Vano" in Liras (1930) and in Euros (2020)		
	Vertically Divided Apartment Houses (Villini)	S. Saba 1908
A	Structures, plastering, furnishings and systems	£ 8.042 € 6.390,20
B	Roofing basements foundations	£ 3.048 € 2.421,95
C	Land and ancillary accommodations	£ 1.976 € 1.570,13
	TOTAL	£ 13.066 €10.382,30 €/mq 576,79

Table 1. Average Building costs revalued of the "Villini with vertical subdivision type"

Indeed, comparing the current construction costs in Italy, provided by the Association of the Architects (€/mc 451.33 = €/mq 1,353.99) to those, revalued, of the buildings built in San Saba, we notice that the costs of those buildings were less than half of the current ones. (Mazzola, 2010 and 2021; Cocchioni & De Grassi, 1984). The next chapter explains two projects developed by the author and aimed at the urban regeneration of two depersonalizing and dangerous suburbs in Rome and Palermo. These projects indeed, show

how (thanks to the simple reuse of the pre-Fascist laws and tools, as well as traditional masonry) we can achieve the above-mentioned program. In addition to the stated points, these interventions would generate labor, i.e. competitors in restoration, and would have high public profits, instead of costs that could increase the public debt.

2. Thoughts that led to the design for the Urban Regeneration of the districts Corviale in Rome and ZEN in Palermo



Fig. 5. Project for Corviale – Before and after.



Fig. 6. Project for the Z.E.N. – Before and after.

The projects developed for the Urban Regeneration of the social housing districts Corviale in Rome and Z.E.N. in Palermo, are not about the umpteenth hypothetical theory of reinventing the wheel. Indeed, they simply want to show what we can do through recovering either the laws, tools or policy of

the earliest XX Century, tested for more than 100 years. The strategy of those days shows not only the positive effects in terms of urbanism, architecture, sociology and economy on the suburban districts, but also the reverberation on the environment, on the historical city and the historical buildings, thanks to the recreation of a large competing workforce. In both cases, the projects show the gradual substitution and re-compacting of the urban fabric, creating a dense and compact environment, consistent with the local tradition, although the buildings designed are airier than the historical models, thanks to the large garden courtyards.

As mentioned, the urban renewal of these districts can translate not only into more dignified housing and urban environment for the residents, but it can also generate employment, with different expectations in life and a concrete promise of social renewal: the relaunch of the local crafts industry can act as a driver for the local economy as a whole.

The idea of relaunching the local crafts industry and economy should proceed in step with the tackling of another problem, which is being little discussed, academically and politically, but which deserves greater attention. The collapses of buildings occurred during the recent Italian earthquakes in L'Aquila, Emilia Romagna and Amatrice, but also those occurred in Pompei, Rome and Barletta, have unequivocally highlighted the consequences of the "ideological" teachings of the last 70 years and of the construction practices, constantly ignoring preservation. The use of "modern" techniques and materials has created a class of technicians who do not have the means for restoring a traditional building. This situation has significantly harmed our heritage because of the use of inappropriate structures and materials significantly different from the original structures. (Cruz et al., 2016; Marconi et al., 2004; Ranellucci, 2009 and 2011).

This has also produced difficulties in finding laborers qualified for historical buildings that, when found, they are too expensive, because of a lack of competition in the branch. For this reason, in the age of “sustainability” indeed, it would be wise to restart building as in the recent past. Indeed, it is more than clear now as those early 20th century buildings feature no maintenance costs and have excellent performances in terms of temperature and humidity. This means that, the recovery of this way of building would help train vast numbers of skilled laborers competitors, i.e. we would be sure to have a reduction of future maintenance costs of listed buildings. Considering our enormous heritage, it could be the Italian first source of revenue.

A thought on the matter is now necessary. Speaking in terms of “sustainability”, the A.N.A.B. (National Association of Bioclimatic Architecture) has recently declared that: «*The operating costs of conventional buildings are set to rise more and more! Faced with scarcer and scarcer energy resources, the only way man can protect himself from climate change is through architecture*».

Someone might object that it is unnecessary to start building in an “old fashioned” way, with stone, tufa, bricks and wood, because “green building” or “bioarchitecture” are respectful of the environment and can already reduce energy consumption, as they belong to ‘energy efficiency class A’ according to the European Union energy label. Actually much talk is made of Bio-climatic architecture, *Bioarchitecture*, *Eco-sustainability*, *bio-sustainable balance*, *LEED* (Leadership in Energy and Environmental Design), etc. ... but the question we should be asking ourselves is, are the buildings presented with the “bio” tag really such?

According to the A.N.A.B. (Associazione Nazionale Architettura Bioclimatica), the materials and products suited to eco-sustainable building should comply with the following requirements:

1. *Re-generable and come from different natural resources;*
2. *Produced with a low impact on the environment;*
3. *Low polluting, i.e. they should not emit toxic substances, during manufacturing or use.;*
4. *Use little energy for their production, transportation and use;*
5. *Guarantee the durability and maintainability of the various products, to avoid energy and economic waste;*
6. *Feature good energy conservation properties.*

Therefore, in the light of the above, the engineers, architects and experts who support the above mentioned techniques, see themselves as technicians whose design approach is based on the principles of bio-compatibility and eco-sustainability. If, however, we carefully analyze the architectural output of these technicians (and their movements), behind which (*more or less openly*) hide the insulation system manufacturers, we will discover that all this care for the environment is only a front.

The buildings feature the usual sinister modernist look, with enormous glazed surfaces – which notoriously produce heat dispersion – justified by the fact that, in the colder countries, it is necessary to let in as much sunlight as possible. The most disturbing aspect, in all this situation, is that the construction materials used are actually the result of industrial experimentation – which is totally alien to the idea of relaunching the local economies – all the materials used and advertised in the specialized press entail a huge waste of energy during production. Moreover, since they are usually produced far from the construction sites, they also require expensive road transportation, which translates into high oil consumption and atmospheric pollution.

Furthermore, it often occurs that, at the conferences and in the magazines supporting these design orientations, you find people who claim that even high-rise buildings are sustainable, while speaking of vertical gardens and saving land, despite the fact that they know

very well those vertical gardens are nonsense and are possible only in computer renderings. While high-rise buildings are, as matter of fact, the most energy intensive and biggest traffic generating buildings around. High-rise buildings, in fact, are intensely dependent on air conditioning and electricity for vertical movements. Moreover, high-rise buildings require huge car parks and large roads to absorb and convey the large numbers of cars directed to these “*concentrators of human beings*”.

One can simply search the web and find out exactly how many of the so-called eco-sustainable materials suggested by these bio-architects are actually manufactured and used over very short distances, and how many, instead, are industrially produced and certified with some EEC label. ... So, why spend time and energy in constantly researching and experimenting new solutions – which are often expensive, harmful and short-lived – to solve problems for which our wise predecessors had already found a viable solution? What harm is there in reconsidering the materials and technical solutions that time and experience have shown to be perfectly valid and respectful of the environment? In addition, given the bad results of industrially produced buildings, why shouldn't we once again start placing our trust in our local artisans, who have been able to produce that marvel of consistency and respect for the environment, i.e. the historic city centers that the whole world envies us? At least until 1927, people thought that:

«[...] While men are men, made of dimensions, needs, habits, many devices that served their purpose perfectly well in the past are still quite efficient today [...] the old methods, if adequately transformed, or even turned right around, can almost always give new ideas to researchers. It would be unjust and (we believe) unfortunate for the craft if, in designing our modern buildings, we failed to take into due account the typical climate and environment of the various parts of our country». (Associazione Artistica fra i Cultori di Architettura, 1927).

Therefore, we must reflect on the fact that, unlike in the case of green building, Traditional Architecture, using the local materials and construction techniques, besides perfectly responding to all the requirements for the recognition of so-called eco-sustainable architecture, also features a number of added values:

1. The building materials are easily available;
2. The building techniques are inexpensive;
3. Maintenance costs are significantly reduced;
4. Supplies do not require long and polluting transportation;
5. The proceeds from the construction process remain locally;
6. The construction industry facilitates the growth of local economy;
7. Unemployment can be reduced, as a consequence of the above mentioned improvements;
8. The costs for restoring our architectural heritage can be significantly reduced, as a result of the rediscovery of the traditional building techniques and materials, and the re-training of the building industry workforce on a much larger scale, creating a competitive market;
9. Respect of the local climatic conditions can be assured;
10. Energy consumption can be reduced for heating and cooling the buildings, as a result of the use of traditional masonry techniques, with a perfect – and natural – behavior, in terms of heat and humidity, ensuring savings of up to 50% for heating and 100% for cooling;
11. Buildings integrate better in their surroundings.

We have a large amount of information on this subject, left to us by our forebears, which has been updated and (partly) used in the Architectural Recovery Manuals, a series of books fundamentally important for local technicians. To those who object that historical buildings do not comply with the applicable

anti-seismic building regulations and, therefore, should not be taken as a model, we can respond with the simple evidence of fact. Earthquakes, indeed, have hit many of these regions, many times, some of which have been devastating, yet the ancient (unmodified) buildings are still in their place, long before the invention of reinforced concrete and the knowledge of modern construction science. (Ruggieri et al., 2013). Of course, not all buildings have been built according to the applicable standards and best construction practices, which means that there may be perfect buildings and less-resistant buildings. However, thanks to the recent studies on several technical solutions used in the past by good builders, those Manuals have graphically and scientifically documented the various solutions needed to ensure the perfect seismic behavior of masonry buildings.

The Manuals provide information on all parts of the building, from the walls to the vaults, from the stairs to the floors and the roof, as well as non-structural details that are fundamental for the consistency of the buildings and for defining their character, e. g. typical doors, windows, floorings, ironwork, railings, chimney pots, water drainage systems. Practically speaking, according to a historical design and nature-loving approach, the Manuals, and all the old treatises can provide a linguistic abacus for a modern architecture ensuring seamless continuity with the past; a modern architecture that is also a school for training local artisans, who are necessary for restoration work.



Fig. 7. Project for Corviale – Aerial view of the central Piazza, from the Elementary School to the Town Hall.



Fig. 8. Project for Corviale – Aerial view of the central Piazza, from the Town Hall to the Elementary School.



Fig. 9. Project for Corviale – Aerial view of the lot XII adjacent to the Elementary School.



Fig. 10. Project for Corviale – Aerial view of the Lot IV and the two piazzas with the Market Loggia and the Church.



Fig. 11. Project for Corviale – View of the Market Loggia



Fig. 12. Project for Corviale – View of the Piazza with the Church and the Market Loggia.



Fig. 16. Project for the Z.E.N. – View of the Piazza of the Market.



Fig. 13. Project for Corviale – View of the lot XX adjacent to the Public Park.



Fig. 17. Project for the Z.E.N. – Aerial view of the Piazza of the Market.



Fig. 14. Project for Corviale – View of the Piazza of the Movie-Theater.

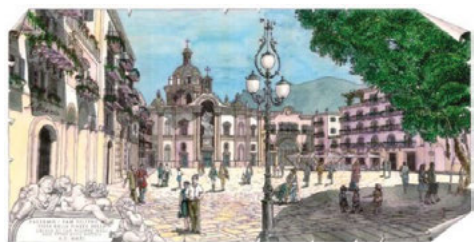


Fig. 15. Project for the Z.E.N. – View of the Piazza of the Church of San Filippo Neri.

The business plans developed for the regeneration projects for the Corviale and Zen show how, through the simple reuse of the above-mentioned earliest 20th Century solutions, (social, technical and economic), it will be possible to regenerate these neglected places. Moreover, it will be possible to bring back land to countryside, to create self-sufficient settlements provided of all the needed life functions and finally, to have public profits, instead of increasing public debt. In both cases, the business plan shows a revenue of hundreds millions of Euros, which can be reinvested to improve other sad, dangerous and forgotten suburban districts.

References

Mazzola, E. M. (2004). *“Contro Storia dell’Architettura Moderna, Roma 1900-1940 – A Counter History of Modern Architecture, Rome 1900-1940”* Alinea.

Mazzola, E. M. (2010). *“The Sustainable City is Possible - La Città Sostenibile è Possibile”*, preface by Paolo Marconi. Gangemi.

- Mazzola, E. M. (2021). “*Rigenerazione Urbana – Urban Regeneration*”, Vertigo.
- Cocchioni C., De Grassi M. (1984). “*La Casa Popolare a Roma, Trent'anni di attività dell'ICP*”, Kappa.
- Briotti, A. (1988). “*Il Quartiere San Saba e l'Aventino*”, Kappa.
- Associazione Artistica fra i Cultori di Architettura (1927). “*L'Architettura Minore in Italia – l'Architettura Minore a Roma tra '500 e '800*”, edizioni Crudo & C., 2 volumes.
- Amichevoli, C. (1675). *Architettura Civile ridotta a metodo Facile e Breve*. Bernardo Arnazzini.
- Napoli, T. M. (1688). *Utriusque Architecturae Compendium*.
- Amico, G. B. (1726). *L'Architetto Pratico*.
- Dolce, C. (1823). *relazione sul Sisma di Palermo del 1823*.
- Ufficio Tecnico Comunale, (1889). *Patti e Condizioni relativi alla Costruzione e Restauro delle Strade Interne ed Esterne e di alcuni Edifici del Comune di Palermo, Tariffa Generale*.
- Various authors, scientific responsible, Marconi, P., (2004). “*Manuale del Recupero del Comune di Roma*”, DEI.
- Giovannetti, F. (editor), scientific responsible Marconi, P. (1997). “*Manuale del Recupero del Centro Storico di Palermo*”, Flaccovio Editore.
- Ranellucci, S. “*Manuale del Recupero della Regione Abruzzo*”, Edizioni DEI, 2 volumes.
- Ranellucci, S. (2009) “*Manuale del Recupero della Regione Marche*”, DEI.
- Cruz, H., Saporiti J., Campos C., Candeias, P., Ruggieri, N., Catarino, J. (2016). “*Historical Earthquake-Resistant Timber Framing in the Mediterranean Area- HEaRT 2015*” – *Lecture Notes in Civil Engineering*.
- Neretti G., Soma F., (1982). “*La verifica termogrametrica delle pareti – teoria, esempi di calcolo, caratteristiche dei materiali, 124 esempi precalcolati*”. Ulrico Hoepli Editore SpA.
- Ruggieri N., Tampone N., Zinno G., (2013). “*Typical failures, seismic behavior and safety of the “Bourbon system” with timber framing, in “Advanced Materials Research” Vol. 778. Trans Tech Publications.*