Architecture is a Common Good

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Cover photography by Angelo Abbate
Page 4: Detail from Giotto, Legend of St. Francis, Assisi (1295–1299)

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Quali-quantitative Methods for Analyzing Urban Structure and Supporting Regeneration Policies

Anna Rita Petroselli & Maria Ioannilli
University of Rome Tor Vergata, Italy

ABSTRACT

This study focuses on a method based on the morphological-typological analysis of urban settlements, where some qualitative-quantitative indicators are identified. These indicators compare the metrics of the buildings with their conservation status, in order to gain useful information concerning the needs and potential strategy of intervention and provide an overall picture of the state of deterioration of urban aggregates (such as architecture, structure, and energy usage). Further, they allow for a first economic estimate of the regeneration of the entire urban space. The study occurred in the district of Villa Adriana in Tivoli (Rome), which due to its almost spontaneous origin, suits well the application and validation of the proposed method. The method has potential to address all the functional, urban, and territorial deficiencies in order to spread space regeneration.

***Keywords*:** urban quality, regeneration, urban policies.

INTRODUCTION

Italy adopted a National Urban Development Law (LUN 1150/1942) during the Second World War. However, this law did not apply when, in 1945, the reconstruction phase began.

In fact, damages were huge and involved buidings, roads, and railway infrastructures. The need to respond quickly to such problems led to the abandonment of the LUN. Reconstruction occurred through the enforcement of emergency reconstruction plans, which were simple tools for quick rebuilding the demolished areas. Municipalities included in special lists drawn up by the Ministry of Public Works, were required, within three months, to approve these plans, which were financed by the Ministry itself.

The reconstruction plans had to respond to the real and urgent demand for housing, but the choice to set aside the LUN led to the dominance of urban speculation mechanisms. In fact, the reconstruction plans did not foresee the organic reconstruction of the cities, the integration with the new buildings, nor the implementation of the necessary services and green areas.

These plans seemed to respond to an objective of economic development, but they actually promoted the development of a construction industry based on land speculation. Moreover, precisely because of the speculative nature of the reconstruction process, they failed to meet the growing demand of housing due to the massive immigration phenomena from the south to the north of Italy, which was very relevant at that time.

Also due to this inability to meet the housing demand, many spontaneous housing units came to life in the same period. The resulting settlement systems were built with poor material and low architectural quality and were often spatially ill-organized. To make things worse, the application of urban plans did not intervene on these spontaneous aggregates, for example by expanding streets or providing the establishment of new qualified spaces within them. On the contrary, these settlements were assumed as historicized urban forms where “the prevalence of previous abusivism is legalized, binding the interstitial areas left free by redevelopment interventions” (Clementi & Perego, 1983).

Therefore, urban policies adopted in the various time phases of the building development, instead of improving the environmental and settlement conditions, have contributed to deface many urban scenarios. The presence of historical centers often abandoned and ghettoized, or suburbs disconnected and fragmented compared to the rest of the original city are now evident; peri-urban areas increasingly consumed by new settlements are often still of poor quality.

Nowadays, the dissatisfaction generated by this territorial, economic, and social scenario, especially concerning urban form and quality, encouraged a debate on plans and redevelopment projects oriented towards the material transformations of the settlements.

Today, in order to refrain the expansion of cities and bring back acceptable profiles of urban livability, scholars and designers are focusing on the qualitative aspects that were neglected when the only objective was the quantitative development.

Intense urban growth, the fragmentariness of the peri-urban areas, and the consequences of wrong and unaware planning policies, have led to present-day interventions with a “mending and repair” attitude, which includes a hydrogeological, seismic and aesthetic care (Piano, 2014).

This is the current conformation of the post-modern city that we are required to confront with, where the lack of urban quality concerns both the public component (public space, services and infrastructures) as well as the private (building) component.

INTERVENTION POLICIES

Until recently, the concept of redevelopment of the urban areas (building and public spaces) mainly regarded punctual insertions, within degraded contexts, of "quality" elements to improve the outward appearance of the (generally public) space, yet without substantially addressing the surrounding conditions of degradation.

In some cases, such interventions may have improved the quality of squares or open spaces of historical centers but left the suburbs in a state of increasingly widespread decay.

The empirical observation shows us today how the punctual addition of qualitative elements, without the support of other interventions in the neighboring space, loses effectiveness in a relatively short time, undermining the benefit produced at the time of their insertion.

The cognizance of the scarce effectiveness of the policies so far conducted changes the approach to the question, also in lexical terms.

No more repair or redevelopment, but urban regeneration

The reference frame, for the topic of urban regeneration, is certainly very broad as it contains the "physical, social, cultural, economic, and aesthetic aspects that influence individuals and communities and which determine their forms, characteristics, systems of relationships and survival" (Filpa & Talia, 2015).

In order to improve the environmental, territorial, social and economic profiles of contemporary urban areas, it is therefore necessary to adopt suitable urban regeneration programs aimed at raising the widespread quality of urban space and of public and private buildings for the re-use of contaminated or decommissioned areas. These programs should guarantee a consistent and adequate containment of land consumption. This implies, however, a revision of the development areas included in the already approved urban and territorial plans, and the drafting of new forecasting tools. These will joint better information and participation systems, until now almost completely ignored, allowing for the assesment of the options that best fit the specific planned context.

> A high-quality environment can improve the feeling of well-being in a certain place and, therefore, its utility. Further, it can also create a sense of community, communication/relational networks, social capital, and civic spirit. In other words, beauty (an aesthetic value), produces economic, ethical, and cultural values along with the perception that "it is good" to take care of that site (Fusco Girard, 2004).

The deep interest in this issue is documented within the national, European, and worldwide policies aimed at solving, at least in part, the problem of drop in urban and environmental quality. There are many examples of urban regeneration policies in Europe, such as:

- Madrid (2008), with the redevelopment of the popular district of Lavapiés, an area with substantial decay and squatted or empty houses.

- Ghent, where a strong incentive is expected after involving the population on smart city development policies;

- Copenhagen, where the application of a simple but effective model of urban regeneration still follows the integrated and sustainable approach of the 1947 *Finger Planen* and its directions of urban development and environmental planning. Such a plan today directs new models of urban regeneration.

As Forgione (2008) says, "Quality refers to certain characters that are strictly and directly related to the current processes of development of the urban economy;" nevertheless, the Italian planning practice has significantly neglected this correlation.

URBAN QUALITY

The concept of urban quality is actually very complex and articulated and it is quite difficult to summarize it in a single definition.

We can quote Zaffagnini (1980) who says,

> Urban quality is not identified only with respect to the provisions contained in urban planning instruments ... to urban planning standards ... in the avalibility of services ... in the definition and adoption of an optimal building type ... in the differentiation of building types, in their volumetric and altimetric counterpoint ... with the good architecture of the buildings ... not even [is] the result of the sole participation or decentralization or self-management choices inherent to their habitat ... Urban quality is not achieved automatically by giving everyone a home ... Urban quality is none of these conditions, if taken separately, but it is the set of all and many others that are difficult and, perhaps, impossible to find because they are linked to facts that are not always objectifiable or constant over time.

Attempting to define a metric, which can return urban quality indicators even though centered on the physical component of the aggregates, is certainly a partial and perhaps not entirely shareable objective. However, by focusing on robust information that is viable to the public authorities and useful for the formulation of new urban policies, we cannot escape from it, while being aware of the simplifications that will be introduced in the determination of these indicators.

In addition to the morphological aspect of urban contexts, the concept of quality defines more immaterial and perceptive characterizations of the territory and its content. A perceived quality through "the interpretation of how the inhabitants of a city perceive it and therefore find some parts either unpleasant or repulsive and others pleasing and attractive" (Lynch, 1960).

Again, according to Zaffagnini, urban quality,

> … is the color of the walls, the texture of the road pavements, the differences in height and between the paths; a lawn without litter and needles, a tuft of trees not poisoned by carbon monoxide, the vine that covers a wall at the end of the street; a sidewalk clear of cars, a bench in the summer shade, a porch on rainy days, the phone booth when you need it; the scent of lime trees and roast chestnuts; the cheerful shouting of children leaving school and the sad trampling of those who slowly accompany their friend on their last journey. It is education, civic sense, solidarity; it is awareness of its citizens' rights. It is culture (Zaffagnini, 1980)

However, in this research study we have tried to give a quantitative substance, albeit partial, of the quality of the settlement system, which we analyse in terms of architecture, structure, and energy with a specific reference to private space.

The defined indicators make it possible to identify, under the minimal evaluation hypothesis, the possible interventions required to raise the quality level of a specific urban component.

APPLICATION METHODOLOGY: FROM CONTEXT ANALYSIS TO URBAN QUALITY INDICATORS

To obtain the above-described results, we hypothesize that a typological analysis should be carried out to highlight the real condition of the buildings in an urban aggregate, considering both their constructive characteristics and their state of conservation and use.

This would guarantee a reasonable degree of success when redeveloping the private building heritage. Moreover, this kind of analysis also allows for highlighting the generative phenomena of the urban organism and, more generally, of the built-up environment, by taking in account its social and economic context.

Facing the problems of architectural, structural, and energetic quality of the building system from a typological point of view, allows us to somehow define the transformability degree of each building and to assess the effect of the intervention on the entire urban system.

For this purpose, the first required analytical step is a survey of the state of facts and the characteristics of the built-up space, in order to produce a sort of preliminary "snapshot" of the urban context. It will be then possible to outline upon it the potential "tweaks" for an improvement of the image of the city as a whole.

The definition of the applicable interventions on each building or private space in general (for example, an adjacent green lot) enables us to asses the effect generated in the surroundings. In this way, it becomes possible to make some general predictions. Such a positive feedback can show up in the building complex and even more in the urban settlement.

Recognizing the technical characteristics and the state of conservation of the building heritage and typifying the possible interventions aimed at its redevelopment, offers the possibility of defining targeted intervention policies, which are easy to communicate to the owners. Therefore, each single private investor will owe the evaluation elements with respect to his potential "economic" involvement in the redevelopment process.

The analytical process required to obtain such informative products is the following.

1. First, an analysis is performed at global (urban) and local (district) scale, concerning the arrangement of public and private spaces. This kind of analysis allows for evaluating the specific local context (the district) compared to the whole urban area. Then, on a local scale, all the buildings are analysed in terms of dimensions, characteristics and use, and finally categorized in order to define specific categories of intervention that one can enforce.

2. A second-level analysis concerns the potentially transformable areas. At this level, the analysis focuses on the physical consistency of the different urban components (buildings,

roads, empty spaces, green areas etc.). Each space (public and private) is therefore qualified and classified according to the characteristics of the component parts. For the public space, the components taken into consideration are the roadway size, sidewalks, lighting, road and road surface conditions, and all those elements that can offer indications for subsequent interventions. For the dimensional classification of private space (buildings) the canonical surface, height, and built-up volume metrics will be used. About the greenery, one shall evaluate, besides surface, the waterproofed surface, trees (if present), and their state of maintenance.

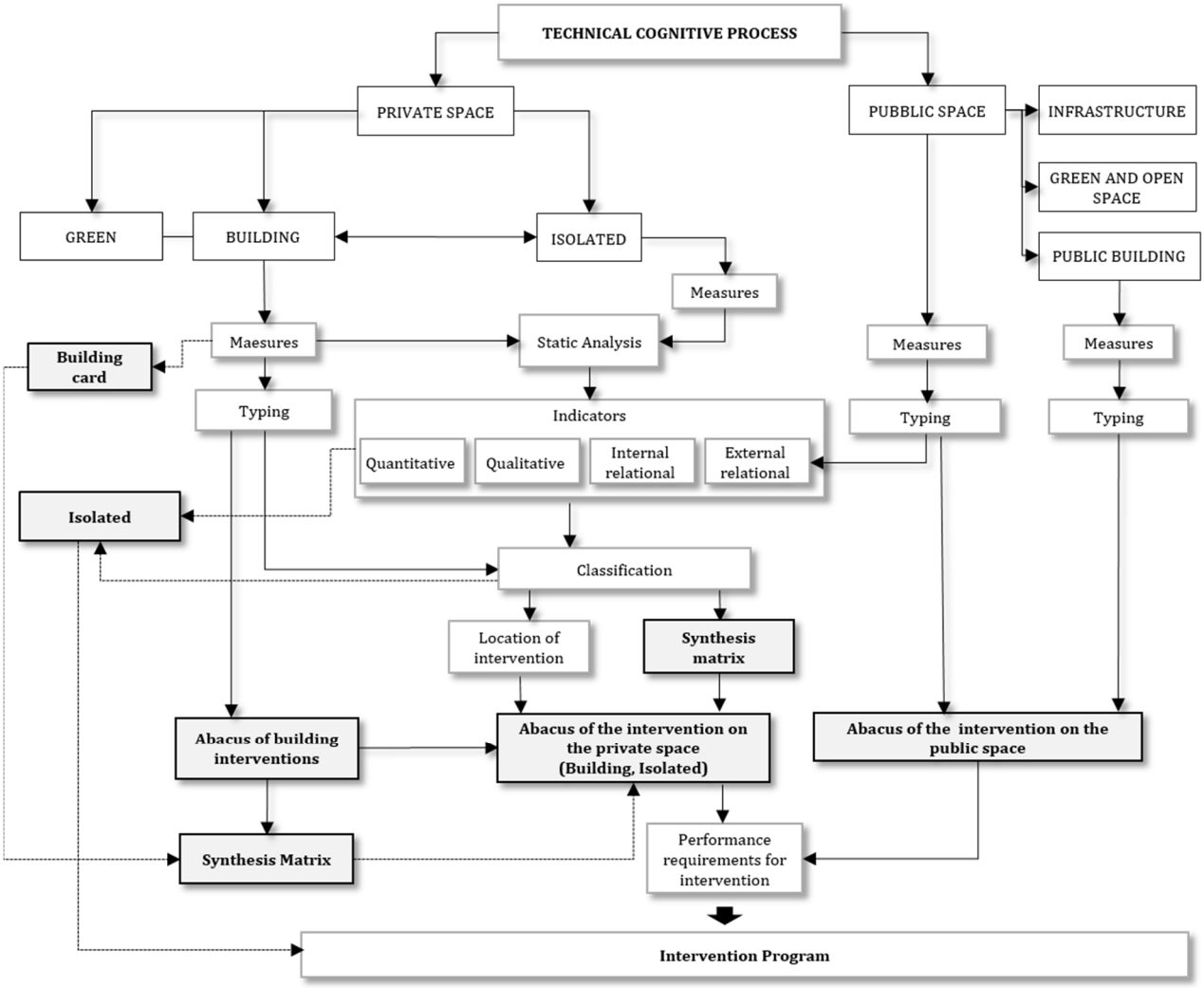

Figure 1. Technical cognitive process.

3. The same physical elements are then classified according to a possible intervention, leading to deciding if a restructuration is effectively needed. When dealing with the building heritage, the architectural structure (simple or complex) and the building's "aptitude" for a tech redevelopment (façades or solar panels, for example) are among the most significant characteristics.

4. For each type of settlement present in the area, it is then possible to identify the intervention requirements, in terms of quantity and quality, by assessing the state of degradation and the vocation to re-use or redevelopment.

5. All the categories of intervention are then defined from the points of view of landscape and environment, of public space and transportation network, and of private properties. All the elements that compose each category and the relative times and costs of realization need to be specified.

6. Finally, administrative procedures are outlined, to make the various interventions viable and "stimulate" their application.

The implementation of the above analytical process produces the informative synthesis presented in the following section.

BUILDING SHEET

This sheet records all the geometric characteristics of the private buildings and the pertinence lots, as well ad their use. The following image represents the reported variables.

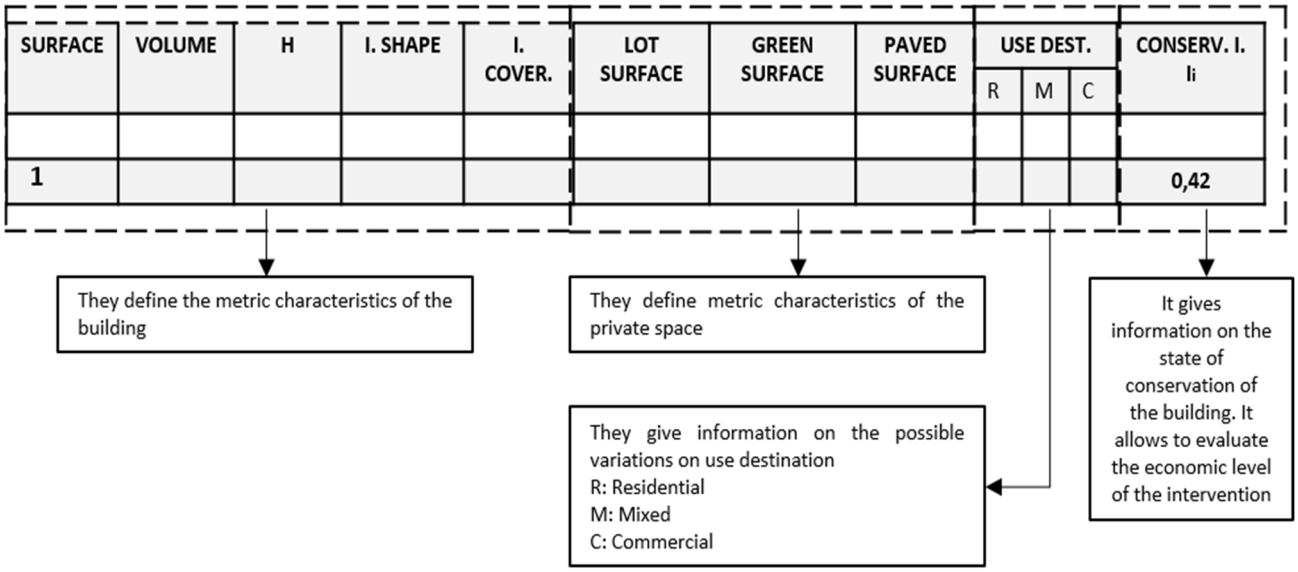

Figure 2. Building sheet.

ABACUS OF BUILDING INTERVENTIONS

The Abacus collects all the general information. It is therefore applicable to various urban contexts, thus constituting a useful support to the widespread application of the regeneration process to different urban settlements.

The Abacus of the intervention reports the contents, aims, and good rules of intervention on buildings and open spaces.

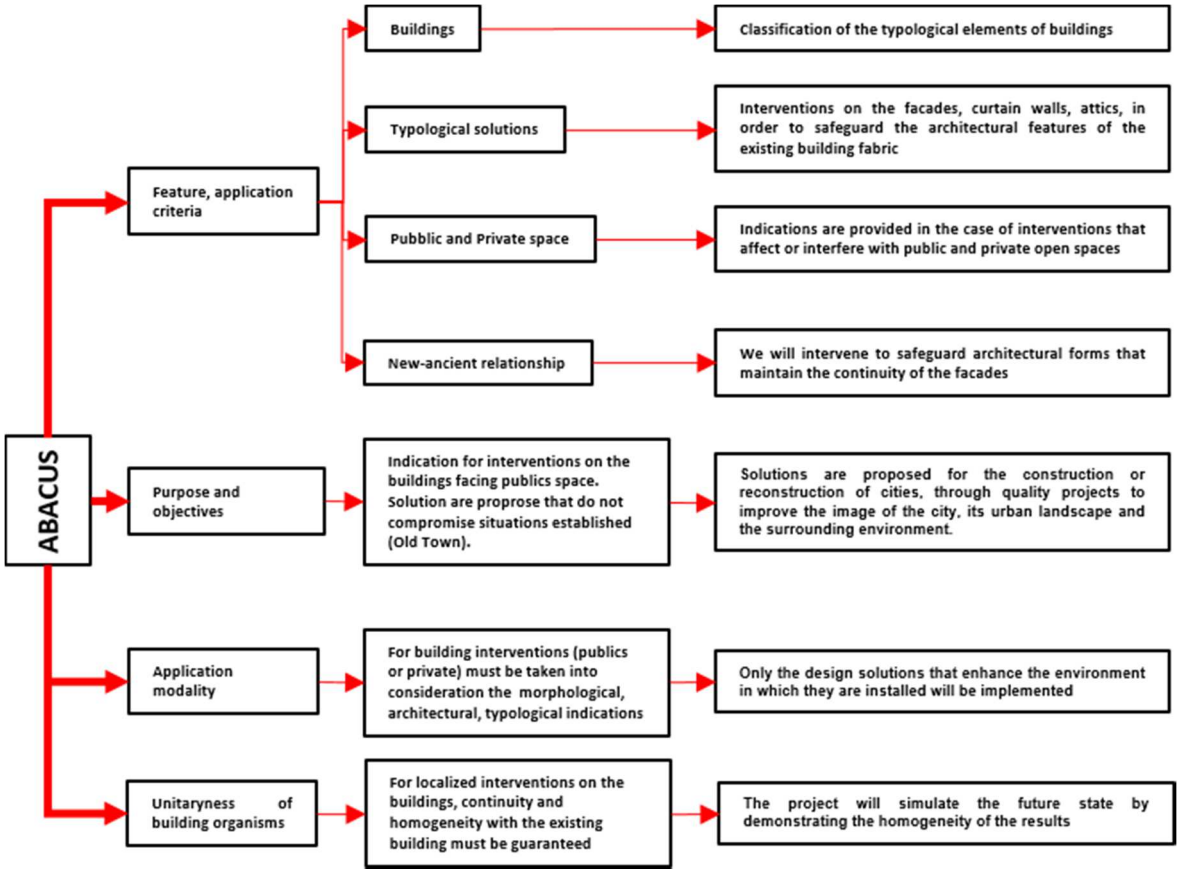

Figure 3. Scheme of the Abacus.

SYNTHESIS MATRIX

The Synthesis Matrix summarizes the principal types of processes required for the redevelopment of each building, providing for work guidance.

The interventions are classified into four types:

- structural, including demolitions and reconstructions, even partial, elevations to standardize the heights of buildings, replacement of roofs, closing of terraces, etc.;
- architectural, including reconstruction of façades, elimination of poor quality surfaces or parts, inclusion of decorative elements, etc.;
- energy, including solar façades, photovoltaic panels, or use of other technologies;
- urban furniture (*decorum*).

By applying the Synthesis Matrix to the Building Sheet, it is possible to define, for each building, an Intervention Index (*Ii*) which represents, by means of an indicator whose normalized value is between 0 and 1, the total burden of the hypothesized intervention. This is possible having defined a weight for each intervention belonging to the different types described above. Increasing values of the *Ii* Index indicate that, in order to redevelop a single building, substantial or multiple operations are

necessary. This therefore offers a representation of the poor state of maintenance of the building itself. On the contrary, low *Ii* values show that the state of conservation and maintenance does not require relevant redevelopment interventions.

				ARCHITECTURAL				
CRITICAL ISSUES		INTERVENTION	STRUCTURAL (A)	PLASTER (B)	PAITING (C)	FACING (D)	ENERGY (E)	URBAN DECORATION (F)
ENLARGEMENT	(1)	Raising	X	X	X	X	X	
	(2)	Closing balconies						X
DEMOL./RICOSTR	(3)	Degraded buildings	X	X	X	X	X	X
	(4)	Superflous	X	X	X		X	X
	(5)	Dangerous volume						X
	(6)	Lean-to	X				X	X
	(7)	Non-decorative elements						X
FRONT	(8)	Exterior finishes restoration		X	X	X		X
	(9)	Plaster realization		X	X	X		
	(10)	Exterior paiting			X			
	(11)	Railing, sunshade						X
	(12)	Facing					X	
	(13)	Standing finish					X	X
	(14)	Coverage remaking	X				X	
	(15)	Extraordinary maintenance					X	X
	(16)	Restoration/improvement	X	X	X	X	X	
	(17)	Redevelopment		X	X	X	X	
REMOVAL	(18)	Eternit removal						X

Figure 4. Synthesis Matrix.

QUALITY CARD OF THE URBAN BLOCKS

With the aim of reconstructing the overall picture of the qualitative status of the urban settlement upon which the regeneration process will be applied, the urban blocks are subject to a classification process in function of:

- the quantitative characteristics of the construction contained therein, namely: Coverage Index (*S1*); Index of Construction Fragmentarity (*S2*); Medium Form Index (*S3*); Form Homogeneity Index (*S4*); Volumetric Density Index (*V1*); Medium Volume Index (*V2*); Volume Homogeneity Index (*V3*); Mean Height Index (*H1*); Height Homogeneity Index (*H2*);

- the state of conservation of the block, evaluated by operating a weighted average between the number of buildings requiring only architectonically interventions and those affected by structural issues, with respect to the total number of buildings present in the block, and normalized with the most burdensome condition (both structural and architectural);

- the percentage of permeable area (ISV), i.e. the private greenery present in the block;

- the Architectural Homogeneity (OA) determined by the ratio between the (prevalent) number of buildings sharing the same kind of façade;

- architectural features, such as painting or small brick, and the total number of buildings on the block.

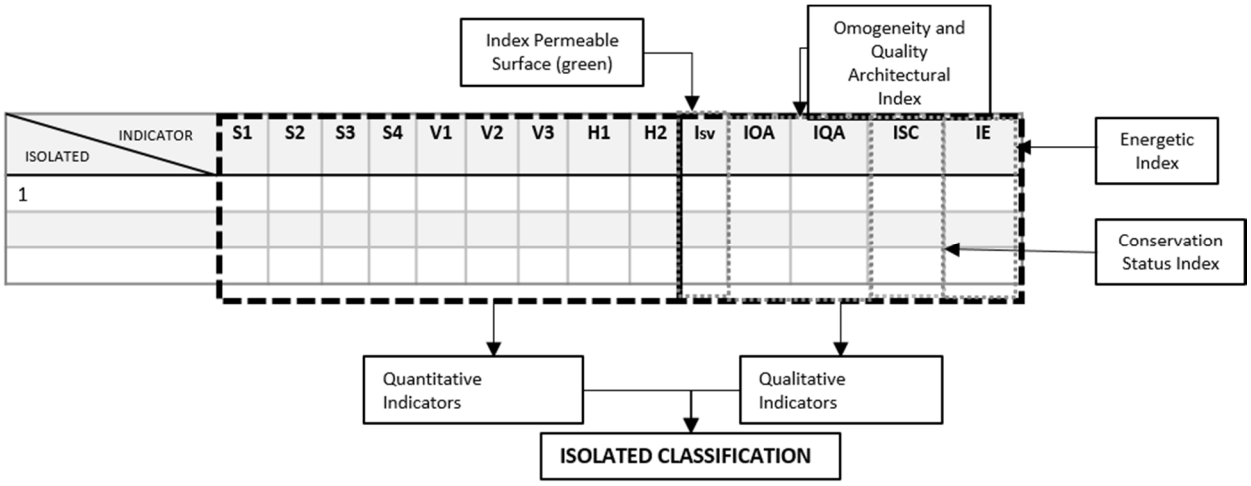

Figure 5. Classification of the urban block.

THE REFERENCE CONTEXT FOR EXPERIMENTATION: THE DISTRICT OF VILLA ADRIANA IN TIVOLI (ROME)

Located in the wide and sunny Piana Tiburtina, at the foot of the historical center of the city of Tivoli, the district is located near the archaeological area of Villa Adriana, hence its name. The birth of the first "urban" settlements along Via Tiburtina dates to 1943, yet it is the rapid economic and industrial growth after the war that attracts numerous immigrants in the surroundings of Tivoli. Such an important demographic increase caused the actual urban expansion.

The post-war small aggregates of scattered houses near the factories of the Piana Tiburtina, often "spontaneous", began to expand "wildly" during the 1970s, without any urban or territorial planning (the only Regulatory Plan of the Municipality of Tivoli dates to 1973). In this period, in fact, there was an increasingly rapid and spatially broader growth, due the fact that the 1962 Urban Plan had excluded most of the areas of the eastern slope from legal expansion. "It was easy to foresee that the presence of the large centers located outside the municipal territory (Tivoli, Guidonia, and Monterotondo) would have favoured a spontaneous urbanization in this territorial sector after 1962" (Garano, 1983).

The industrial development and the considerable number of unqualified workers generated a gap over time between the minoritarian middle class and the massive working class. A process of marginalization caused profound lacerations in the social and economic context, with a sort of "ghettoization" of the working population.

In the '80s, the territory of Tivoli was therefore already sufficiently anthropized in the area surrounding the travertine quarries (near Bagni di Tivoli) and the Pirelli factory, i.e. the district of Villa Adriana.

Born spontaneously, like many other Italian urban areas, the district of Villa Adriana, also called Adrianella, presents features and very simple regulatory layouts that are common to other informal lots. The district is "governed by the elementary geometry of the orthogonal grid, which refers to the

archetypes of the city of foundation of the past. Indeed, the space-ordering techniques have neither the symbolic dimensions nor the ritual forms that presided over the birth of the city of the past ... which had streets, squares, and other spaces for collective activities, completely disappeared in current realities" (Clementi & Perego, 1983).

However, the arrangement of most of the blocks and that of the buildings inside them seems to obey a sort of "planning" because they are arranged along a virtually regular mesh formed by orthogonal axes.

To maximize the buildable area, narrow roads were created, without sidewalks, "connoted only by the endless repetition of the same reticular splitting and of the same building type" (Clementi & Perego, 1983).

In addition to the typical spatial arrangement, which is a peculiarity of spontaneous anthropization, the district of Villa Adriana also presents morphological-typological characteristics of spontaneous construction with a very modest architectural, structural, and material quality.

By analyzing the evolution of the urban fabric between the approval of the Urban Plans of Rome (1962) and Tivoli (1973), it is possible to highlight how the settlement development has always occupied new areas, rather than completing those already partially built.

Moreover, as often happens when planners try to intervene on unplanned building settlements, the insertion of new buildings in such a fringed context exhibits a striking contrast in terms of dimension, typology, and formal solutions. Therefore, these interventions made the context of Villa Adriana worst, instead of recovering it and making it more "pleasant".

The most important among these types of interventions was a great public residential building, built between 1978 and 1985, and named "Triangle" because of the triangular shape of its inner courtyard. The "Triangle", although innovative in its architectural configuration, represents a very critical element in the context of the district, both for its dimension, marginal and separate location, and for lacking public spaces, which were considered in the project but never realized.

The dynamic "spontaneity" of the district unfolded in different temporal phases and produced a widespread urbanization, with variable density areas yet with a certain typological homogeneity (two-three storey buildings, often with flat roofs), although differing in dimension and use of materials.

After the adoption of the General Urban Plan (1973), and the approval of the Parcelling Plans, 5 years later (1978), a new and more "ordered" development process began, which integrated the pre-existing settlements. The uniformity, again, occurred mainly in the typology.

The urbanization of the last twenty years is neater in the form and choice of materials, even if it presents an increase in both surfaces and volumes of the buildings. The only partially built urban blocks were completed and "saturated", while those that had not yet been used were filled, except for the parts facing the main street, i.e. Via Tiburtina.

APPLICATION OF THE METHODOLOGY TO THE REFERENCE CONTEXT

To apply the proposed analysis, we performed the preliminary subdivision of the entire district into urban blocks, which are spatial units enclosed between four vehicular roads. Thirtyfive individual blocks of different sizes and with different buildings were identified.

The results of the spatial analysis outline the general characteristics of the district.

First, data show a variability of the built-up area, in terms of density (S1): 37% of the blocks present dense buildings within them; 31% are medium dense, while the remaining 31% of the buildings are thin.

In most of the blocks (71%), a certain discontinuity in the built-up areas (*S2*) emerges and this leaves us to assume the possibility of interventions.

54% of the blocks are composed of buildings whose shape is averagely compact (S3), 25% of the blocks have a very compact shape, and the remaining 17% have a fragmented shape.

The shape of the buildings, whether compact or not (S4), is almost similar in plan for 77% of the blocks while only 3% of them present a significant heterogeneity.

In terms of volumetric density (V1), the blocks that are sparse, i.e. where the consumption of soil is limited, amount to 9%, while 53% is medium dense and 38% dense. This means that the space has been almost completely saturated. However, if we analyze the results of the indicator V2, which represents the "volumetric profile" of the building, it is easy to see that 50% of the blocks contain buildings with a relatively low volume, 29% feature a medium volume and 21% a relevant volume. From the homegenity point of view, 35 blocks present a very articulated configuration, consisting of several adjoining buildings that are dimensionally, in terms of volumes and heights, very different. Finally, in terms of volume (V3), 44% of the blocks are composed of generally homogeneous buildings, 38% are averagely homogeneous and only 18% are non-homogeneous.

Finally, in terms of height (H1), 40% of the blocks are composed of 1-3 storey buildings; 54% of 3-5 storey buildings, and 16% of more-than-5 storey buildings. Regarding the homogeneity of heights (H2), 44% have an average homogeneity, 26% are homogeneous, and 29% are non-homogeneous.

In terms of the conservation condition of buildings and of possible interventions, not only architectural but also structural, the district is uneven. 46% of the blocks have a good quality level with the presence of buildings that can be improved mainly with external painting; 42% are of average quality, and only 12% would need substantial redevelopment.

About adiacent lots it emerges that 57% areas are impermeable with or without little possibility of greenery improvement; 29% have a smaller part of a permeable surface, and only 4% are almost completely devoid of flooring.

Finally, the architectural homogeneity (OA) is very low. In fact, 76% of the blocks are composed of buildings with different finishing characteristics, while the remaining 24% (positioned in the flat area of the district) is divided equally between blocks with medium and high architectural homogeneity.

INTERVENTION POLICIES THROUGH THE ABACUS AND THE SYNTHESIS MATRIX

To support the intervention policies, the Synthesis Matrix, available for each building, is compared with the Abacus of the interventions, in order to identify what work is needed.

By means of this comparison the matrix identifies the work necessary to raise the quality level of the "private" component of the urban area for each building of each block.

CRITICAL ISSUES		INTERVENTION
ENLARGEMENT	1	Raising
	2	Closing balconies
DEMOL./RICOSTR	3	Degraded buildings
	4	Superflous
	5	Dangerous volume
	6	Lean-to
	7	Non-decorative elements
FRONT	8	Exterior finishes restoration
	9	Plaster realization
	10	Exterior paiting
	11	Railing, sunshade
	12	Facing
	13	Standing finish
	14	Coverage remaking
	15	Extraordinary maintenance
	16	Restoration/improvement
	17	Redevelopment
REMOVAL	18	Eternit removal

ISOLATED 7						
	STRUCTURAL	ARCHITECTURAL				
		PLASTER	PAITING	FACING	ENERGY	URBAN DECORATION
BUILDING	A	B	C	D	E	F
4513	-	-	-	-	-	-
3133	1 - 6	1	1 – 8	-	1	-
3946	1 - 6	1	10	-	1	13
4922	-	-	-	-	-	13
3433		17	17	-	-	11 – 13
2587	1 - 6	-	-	8	1	11
3962	-	-	8	-	-	-
5147	3	3	3	-	3	-
3869	-	-	-	-	-	-
4996	-	-	-	8	-	-
1830	14	-	-	8	-	11 – 13
3661	-	-	-	-	-	13

Figure 6. The Abacus and the Synthesis Matrix

After that, through a detailed metric calculation that describes each category of intervention, it is possible to evaluate the financial commitment needed to redevelop the properties and how to undertake the economic issues such as direct investment and tax incentives.

CONCLUSION

The rapid, often spontaneous growth of industrial cities around their historical core produced a reorganization of the urban physical space, generating settlements of poor architectural, structural, and environmental quality, characterized by physical and social issues such as traffic congestion, unhealthiness, and inequality.

A large stock of public and private housing, mainly built during the economic boom, often undergoes serious degradation in contemporary Italian cities, and the application of traditional urban plans and intervention programs has not substantially changed this condition.

In this context, the implementation of widespread and interstitial urban regeneration policies becomes indispensable.

Due to the amplitude and the capillarity of such urban degradation a widespread knowledge about the state of the places is required in order to achieve a structured picture of the need for retrofitting and make its implementation realistic.

This knowledge concerns, in particular:

- the settlement systems of both old and recent construction;
- the degree of transformability of these systems, in a perspective of cooperation with the owners of the buildings;
- the sustainability and the level of environmental compatibility of potential interventions.

The present study, via the morphological-typological analysis of urban settlements, adopted a method for identifying some qualitative-quantitative indicators, mainly with reference to to the private componensts of the urban areas. By combining the metrics of the buildings with their conservation status, these indicators offer useful information concerning the need and the potential strategy for intervention.

In fact, these indicators, in addition to an overall picture of the state of deterioration of urban aggregates, offer an initial indication of the required economic commitment, both public and private, for the regeneration of the urban space as a whole.

The proposed method was first applied to the district of Villa Adriana in Tivoli (Rome), which, due to its conformation and its state of conservation, presents all the urban, architectural, environmental, and social shortcomings complying with the implementation of a new urban regeneration policy.

REFERENCES

Clementi, A., & Perego, F. (1983). Questioni dell'abusivismo [On squatting]. In A. Clementi, & F. Perego (Eds.). *La metropoli "spontanea". Il caso di Roma.* [The "spontaneous" metropolis: the case of Rome]. (pp. 29–49). Bari: Dedalo.

Filpa, A., & Talia, M. (2015). *Fondamenti di governo del territorio, dal piano di tradizione alle nuove pratiche urbanistiche*. [Elements of planning: From tradition to the new urban practices]. Città di Castello: Carocci.

Forgione, L. (2008). *Percorsi di qualità urbana: l'esperienza dei programmi complessi Approcci, criteri ed esiti*. [Urban quality complex programs experienced: Approaches, criteria, and results]. Rome: Aracne.

Fusco Girard, L., & Nijkamp P. (2004). Le valutazioni integrate tra conservazione e sviluppo. In L. Fusco Girard & P. Nijkamp (Eds.). *Energia, bellezza, partecipazione: la sfida della sostenibilità, valutazioni integrate tra conservazione e sviluppo*. [Energy, beauty, and participation: A balance of the sustainability challenge between preservation and development]. (pp.11–130). Milan: Franco Angeli.

Garano, S. (1983). Politiche urbanistiche [Urban policies]. In A. Clementi, & F. Perego (Eds.). *La metropoli "spontanea". Il caso di Roma.* [The "spontaneous" metropolis: the case of Rome]. (pp. 359–365). Bari: Dedalo.

Lynch, K. (1960). *The image of the city*. Cambridge, MA: The MIT Press.

Piano, R. (2014). Il rammendo delle periferie. [Mending suburbs]. *Il Sole 24 Ore, il Domenicale* (January 26). Retrieved from https://www.ilsole24ore.com/art/cultura/2014-06-18/il-rammendo-periferie-094517.shtml?uuid=ABBYPHSB

Zaffagnini, M. (1980), La lunga strada verso la qualità urbana [A long way to urban quality]. In E. Lombardi. *Modelli abitativi e utenza: l'esperienza danese. La lunga strada verso la qualità urbana.* [Housing models and their users according to the Danish experience: A long way to urban quality]. Milan: BE-MA Editrice.