

Historical center planning in Sardinia: the replacement of the inconsistent building fabric for the renovation of the historic landscape

Anna Maria Colavitti*, Sergio Serra**

key words: city centres, renovation, feasibility, detailed plan, landscape planning

Abstract

Policies for the protection and enhancement of historical settlements have gradually evolved from a predominantly conservative and restrictive approach, aimed at maintaining the physical structure of the urban pattern, to a flexible and argumentative one, thus favouring the renovation of the historic context. The Cultural Heritage and Landscape Code and the European Landscape Convention promote intervention strategies designed to landscape quality objectives to be shared with local communities through participatory and consensual modalities.

The Region of Sardinia has played a key role in the implementation of policies for the recovery and refurbishment of the “first and ancient centres”, as identified by the Regional landscape plan (PPR). This task has been essentially entrusted to detailed plan, a traditional instrument provided for by national and regional legislation.

In addition to the measures for the conservation of historic monuments and minor architecture, urban regulations include plans for altered urban patterns, consisting of a series of settlement rules, expressed through abacus of construction typology too, to be

applied to renovation or replacement interventions of recent buildings fabrics that – due to density, relationships between solids and voids, heights, alignments and views – are incompatible with the values of the context.

Generally, these measures are not appreciated by the owners of buildings legitimately constructed within the historic fabric in accordance with the planning tools then in force and subsequently regarded as inconsistent by the detailed plan. These plan actions would sometimes turn into substantial economic loss for the owner, due to the priority of the landscape quality, and are not designed to be implemented without a real economic advantage for the private landowner.

In this essay, we suggest an assessment of the factors determining the feasibility of demolition and reconstruction of incompatible buildings by discussing an approximate estimate of any increase in the building cubage necessary to ensure cost-effectiveness. The final proposal assumes the creation of a model that takes into account volumetric incentives arising from the recent regulatory changes, in terms of transfer of development rights, to pursue the renovation of historical settlements in Sardinia.

1. FROM THE PROTECTION OF MONUMENTS TO THE RENOVATION OF THE HISTORIC FABRIC

The historic centre issue has evolved over the decades through a continuous comparison between the protection and transformation requirements (Angiuli, 2015). Urban recovery policies must aim at the redefinition of the new role played by the city, bearing in mind the combination between conservation and innovation while respecting the sense of memory of the place (Clementi, 1990; Wallach, 2000).

The industrialization and soil commercialization processes (De Seta 2010) have led, since the second half of the nineteenth century, to a rapid urban development that has produced an increasing separation between historic and new buildings through practices of evisceration and alignment to meet the new requirements of the modern city (Colavitti, Serra, 2013).

Bottai laws in 1939 – which introduced rules for the protection of the individual artistic and historic monuments – promoted an intense debate on the need to extend the protection to urban scale, namely to whole areas of urban historic value, not necessarily monuments (Bonfantini, 2012; Giambruno, 2007).

The classification carried out by general planning and the identification of the area A are insufficient to preserve the historic settlement from weathering processes, outsourcing, abandonment and rapid physical and social change of the fabric (Angiuli, 2015). However, in some regions, for example in Sardinian towns, the social structure and poor economic development - primarily based on agro-pastoral activities - have maintained the historic urban structure unaltered until World War II (Colavitti, Serra, 2013; Cervellati, 1991).

In the 60s the ANCSA (National Association of historic-artistic centres) was established to reinforce a renewed awareness of recovery in the Italian culture, accompanied by the issue of the Gubbio Charter in 1960, which sets out the laws for the protection of historic centres by enhancing the role of urban planning in the protection and renovation of the urban structure resulting from centuries-old processes. The search for universal approaches and practices for historic fabrics seems difficult to be achieved due to the complexity and peculiarities of each settlement (Angiuli, 2015). Since it is a dynamic and ever-changing entity, there is the need for methods constantly updated under varying political, social and economic conditions (Gabrielli, Gastaldi, 2004).

In the 70s the concept of historic centre was enriched with new potentialities thanks to its function as a social good which may generate income, both in financial and in social terms (Mazzoleni, 1991; Tallon, 2010), except for those cases where the ancient centres are located in areas characterised by depopulation and economic regression that make historic town renovation unappealing unless for their reuse as a museum.

The Amsterdam Charter (1975) defines the principles of integrated conservation, combining architectural restoration with the search for appropriate functions, so as to ensure the protection of local peculiarities and keeping the dialectic between *urbs* and *civitas* alive, thus reinforcing the sense of belonging to the community with respect to other places (Aristone, Palazzo, 2000; Bandarin, Van Oers, 2012).

From a regulatory point of view, the introduction of the renovation plan, with Law no. 457/1978, represents an important step for the requalification of historic centres. It is a public or private implementation tool, suitable for certain renovation areas identified in the local general plan that, based on an accurate survey of the historic and architectural values, defines the intervention for the conservation, renewal and reconstruction of the existing buildings.

The disappointing results that may arise from the implementation of renovation plans are partly attributable to the insignificant contribution of private resources (Karrer *et al.*, 1998).

Since the '80s, different assumptions on how to intervene on historic fabrics have been emerging, including the most conservative ones, which gives priority to the artistic and historic values of the settlement, rather and neglect the socio-economic context, thus always suggesting the total conservation of the historic fabric as a museum (Cervellati, 1991).

Integral protection policies have often had negative consequences on the permanence of production and commercial activities as well as on the residential aspects, thus triggering gentrification processes and proving to be unable to comply with law (Indovina, Savino, 1997). The restrictive constraints and the *a priori* integral preservation, even in the presence of a low-value building heritage, have led to different attitudes: the abandonment and the consequent physical degradation or the failure to comply with the rules, illegal construction. In addition, urban renovation has often neglected the social and economic aspects, devoting itself to their physical and morphological transformation degrees, thus failing to develop strategies for re-integrating the historical heritage into the real estate market (Savino, 2005).

Traditional urban plan has often been unable to interpret the historic centre in a broad sense, as a complex cultural asset, going beyond the simple classification of area A. In this regard, the orientation of the Urban Plan of Rome is interesting, as it shifts the attention from the historic centre to the new "historic city", intended as a widespread urban and territorial context to be protected, regardless of the qualification of the individual properties that can be found within the fabric (Ricci, 2011).

In the shift from urban expansion season to the urban renovation one, the Urbani Code of 2004 entrusted landscape planning with various tasks, including: identification of different landscape scenarios and their quality objectives; definition of renovation and

refurbishment interventions for those areas significantly ruined or degraded; implementation of strategies compatible with the protection requirements; consideration of useful measures to ensure the proper integration of transformation into the landscape, in order to achieve a sustainable development of the affected areas.

The participatory and consensual aspect of landscape planning is stressed by the European Landscape Convention of 2000, which defined the so-called "landscape quality objective", such as the formulation, by competent public authorities for a given landscape, of the populations' aspirations with regard to the landscape features of the surrounding area.

News in the national and international scene have had a significant impact on the Sardinian context, which has shown signs of change in the approach to protection and enhancement, particularly after the adoption of the Regional Landscape Plan in 2006.

2. LANDSCAPE APPROACH TO THE PLANNING OF HISTORIC CENTRES IN SARDINIA

The Region of Sardinia has been paying particular attention to the renovation of historic centres (Regione Sardegna, 2013) since a long time, as evidenced by the Regional Law no. 29/1998 "Protection and enhancement of the historical centres in Sardinia". With the entry into force of the Landscape Regional Plan (PPR)¹, which transposes the national standards for the protection of cultural heritage and landscape (Legislative Decree no. 42/2004, Cammelli, 2004), the procedures of historic centres planning have been deeply renewed and included in the plan. The PPR protects the areas with historic settlements, i.e. the development matrices of the first and ancient centres, read by historical cartography, including modern and contemporary centres, specialised work centres and scattered settlements (art. 51 NTA PPR).

It defines the requirements and specific addresses for historic centres, to be taken into account when adapting municipal urban planning instruments. In particular, it operates a clear distinction between the municipalities with or without a detailed plan for the city centre. All actions proposed in the plan are allowed if the latter passed the PPR conformity verification. Conversely, if a detailed tool lacks, only the ordinary and extraordinary maintenance, restoration and internal building renovation are authorised (art. 52, paragraph 1, NTA of PPR).

First, the municipal administration is required to verify the perimeters of the first and ancient centres, through an in-depth analysis of the urban pattern, which takes into

account the various factors that testify its "historicity" (Colavitti, Serra, 2013).

Then, when drawing up the detailed plan for the historic centre², this analysis is further detailed in order to investigate the various physical and socio-cultural aspects of historical settlements, in particular the characteristics of the buildings, the state of preservation of historical heritage, critical issues and emerging problems.

The detailed plan divides the urban fabric into minimum intervention units (UMIs) and classifies the existing buildings based on the age, the traditional historical character or the compatibility with the context in case of recent buildings. Finally, it assesses the historic landscape value which is turned into a different transformability degree and a specific discipline for interventions.

In the adaptation of municipal urban planning tools, the PPR prescribes the development of a set of interventions aimed at preserving the historic stratification of the settlement, so as to allow the reading of the evolution phases of the fabric, and the enhancement of the traces that testify the origin of the settlement. The protection of the peculiarities of each historic centre and the maintenance of the separation between adjacent areas are based on the enhancement of the margins and perimeters of historic buildings. As for renovation and renewal activities, the PPR promotes the search for the original urban layout through renovation and urban planning interventions by replacing incompatible parts and refurbishing public spaces, preferably through public-private partnerships (art. 53 NTA PPR).

Within the historical perimeters, there are frequently urban portions altered in recent times by changes or evolutionary transformations that today have made the historic-identity elements, the typological and constructive features of the building and the structure of the districts less recognizable.

In the draft of the detailed plan, measures are taken to ensure the renovation of such fabrics with a set of rules, expressed through abacus of construction typology, aimed at preserving the identity elements. In particular, for new building fabrics, every intervention has to be compatible, for density, relationship between solids and voids, heights, alignments and appearance, with the pre-existing buildings and context (art. 52 NTA PPR).

In the literature, historic centres have often been regarded as a guardian of identity values to be protected, sometimes neglecting the procedural and perpetual modification of the historical fabric to adapt to the changing and more volatile social and economic needs.

¹ The Landscape Regional Plan was approved and published in the Official Gazette of the Autonomous Region of Sardinia no. 30 of 08/09/2006.

² Until to the entry into force of the PPR, detailed plans governed areas classified as A zone in communal urban plans, while today they extend to the perimeter of first and ancient centres resulting from the co-planning between the Municipality and the Region.

The key element in the PPR is the innovative opening to the transformation of the historical fabric, according to its current use, respecting the pre-eminence of the context values and the identity of each item, even in case of minor buildings, often subjected to degradation, destruction or misguidance, due to a poor understanding of their value.

The PPR does not rule out the programming of new constructions within the Detailed Plans for Historic Centres for any functional upgrade or addition of new volumes, or in case of plots historically unbuilt or affected by the progressive degradation of the existing fabrics, which has led to the almost complete collapse of them, although suggesting a careful assessment of the need to keep empty areas useful for public purposes. Further transformations may be provided for the demolition of buildings, legitimately constructed but inconsistent compared to the original character of the centre, with reconstruction on the same plot, even on a different location (art. 52 NTA PPR).

New development projects must comply with the existing historic characters and context, signs and traces on the territory, in relation to the design of new layouts and building configurations (art. 65 NTA PPR). The transformation and new construction projects are based on criteria and rules derived from the abacus of construction typology, an integral part of the detailed plan expressly mentioned in art. 52 of the PPR rules. The application of the abacus is aimed at interpreting the spatial relationships of the historical type, specific to each centre, avoiding the so-called "typological degradation" caused by the insertion in historical contexts of incompatible building typologies, such as the construction of a house in the middle of a lot, in a pattern of courtyard houses in southern Sardinia.

Municipal plans may include partial or total demolitions, with or without reconstruction, for buildings incompatible with the conservation and proper use of historical assets, or for those that limit their fruition and alter their identity.

Detailed planning of historic centres has often proved to be inadequate for renovation processes, essentially due to the lack of a strategic vision, the static nature of the legislation and the low profitability and cost-effectiveness of the investment in the consolidated urban fabric, which have forced people to consider areas outside the original historic centre (Wallach, 2000).

Specifically, in Sardinia, the structure and methodology used for the detailed plan of historic centre show a strong homologation with respect to the technical regional guidelines, which focus on the morphological-type analysis and highlight a rigid prescriptive connotation of the regulatory system, suggesting a strictly conservative approach (Leone, Zoppi, 2014).

In the regional law, there is a deep contrast between the protection of the historical landscape and the volumetric incentive given for the expansion of buildings within the historic centres, when these are regarded as deprived of

any historical value and incompatible with the landscape by the municipal urban plans. Reference is made to the extraordinary rule with limited validity, Regional Law no. 4/2009, commonly known as "Piano Casa" (House improvement plan), repeatedly extended and modified until the recent Regional Law no. 8/2015, which allows for unauthorised modifications within the historic fabric, in evident contrast with the objectives of the Regional Landscape Plan and by way of derogation from the requirements of the municipal planning tools.

Paradoxically, the detailed plan, when assessing the incompatibility of an existing building, often attributable to an excessive size and volume, requires a volumetric reconfiguration and, at the same time, consent an increase in volume in derogation of planning tools.

Possible expansions within the historic centre, according to the "Piano Casa" drawn up by the Region of Sardinia, are allowed only for buildings with less than fifty years, for which the Municipal Council has adopted a resolution to declare that they are in conflict with the typological and architectural features of the context, and for buildings with more than fifty years if they underwent radical changes after 1959. Typically, within the technical regulations of the detailed plans, buildings classified by the instrument in contrasts with the typological and architectural features of the context are regarded as such (Colavitti, Serra, 2013). The only indication of the buildings age or their contrasting character with the historical fabric do not justify the volumetric reward: for the protection and renovation of the context, it is therefore necessary to preserve the relationship between solids and voids and the harmonious development of the building prospects, therefore a volumetric increase, albeit limited to a building with no historical value, could have negative consequences on the entire historical settlement. In this regard, the "Piano Casa" of the Region of Sardinia does not use incentives as renovation means, but rather attributes less importance to the urban aspect of the interventions rather than to the building ones (Lazzarotti, 2010a). In line with the national situation, the idea to act in derogation of urban planning instruments for any important or urgent operation, intervention or project seems to prevail.

3. THE RENOVATION OF THE HISTORIC LANDSCAPE THROUGH THE DEMOLITION OF INCONGRUOUS ELEMENTS

The Region and the local authorities, in returning high landscape value to the environmental, historic or cultural context, must eliminate or mitigate inconsistent elements, also if legitimately authorized, without any aesthetic value or in contrast with the context, which can cause loss in terms of identity and urban quality (art. 11 NTA PPR). This issue seems to be of great importance in the historic settlements and requires the adoption of a detailed landscape plan as well as of a general urban plan.

A preliminary problem to be solved concerns the criteria for the identification of inconsistent artefacts in the landscape, an assessment that can be expressed only through a high degree of knowledge and awareness of the historical identity of the places. Although the elements and criteria for assessing the inconsistency of buildings with respect to the historic landscape are numerous and heterogeneous, when drafting the plan it is necessary to apply a methodology that attempts to express a unanimous and shared inconsistency judgement.

Generally speaking, those items in contrast with the surrounding landscape are regarded as inconsistent. As for buildings in the historic centre there is the need to identify the dissonance created by the artefact within the immediate surroundings, the irregular skyline, the formal and chromatic contrasts, the loss of the identity of the places, the alteration of typological and volumetric characters, formal inadequacy, volumetric disproportion, lack of balance and harmony between elements (Villari, 2013). In some cases, such incongruities can be removed by interventions of building renovation, while in others it is necessary to completely replace the building after demolition.

The detailed plan performs an in-depth analysis of the historic settlement and classifies recent buildings based on the compatibility with the elements of the surrounding landscape. Instruments cannot impose the demolition of the existing volume, even if it is incompatible with the historic landscape, when it comes to buildings which are regularly authorised according to the regulations and urban planning instruments in force at the time of their construction. However, in order to qualify the historic urban landscape, it may define restrictive measures in the modification of fabrics, limiting the interventions only to extraordinary maintenance, and subordinating the issue of a qualifying title for newly built operations to the demolition of the incompatible building. Sometimes detailed instruments try to encourage private involvement in this mechanism by allowing the redistribution of the existing volume, according to forms consistent with the historical characteristics of the urban fabric and compatible with the building aspects, heights, shadows and position in the plot, in derogation of the most restrictive urban planning parameters and indices.

Experience shows that there are very few cases where private owners are willing to implement this kind of intervention, relying on ownership legitimacy and given the low economic viability of the operation. Any approach taken by the planner collides with the lack of consent of the owner. Overly imposing and rigid attitudes can paradoxically lead to the maintenance of the status quo and to inertia, not only in demolition and reconstruction in compatible forms, but also in the ordinary maintenance of the buildings, which results in a deterioration and degradation conditions.

The detailed plan often seems to be particularly effective in protecting the survivor historic heritage, i.e. in the

application of conservative constraints, but has poor performance in terms of the quality issues referred to in the transformation processes of the consolidated historic fabric.

The buildings defined incompatible by the detailed plans dates back to the second half of the twentieth century, therefore, in principle, it refers to buildings in good state of conservation with a good value in the real estate market. In addition, the incompatibility with the historical landscape is often due to the size of the building and the position in the plot, therefore any renovation objective involves necessarily a reduction in volume, heights and sometimes spatial repositioning, making necessary the demolition of the existing building.

Therefore the cost effectiveness for the private owners, arising from the adhesion to a plan, is reflected directly on the consent and on the effectiveness of this detailed instrument, which cannot be guaranteed without a real feasibility of the interventions. This problem can be addressed through a rewarding mechanism, in terms of monetary incentives, which can hardly be implemented in the current financial conditions of local authorities, or volumetric ones, through the use of development rights as a compensation.

The timely assessment of the economic convenience of each intervention and the possible attribution of volumetric rewards to ensure its implementation, specifically designed for each property in the drafting phase, would be expensive for the planner and would probably result in unfairness as for the treatment of private property. This requires the development of simplified assessment models that, placed at the base of the planning process, help outline a set of renovation and refurbishment actions that may find an effective implementation and contribute to the achievement of the desired landscape quality.

4. THE FEASIBILITY OF DEMOLITION AND RECONSTRUCTION ON SITE

To address the problems highlighted, a simplified model was studied for assessing the economic feasibility of the proposed volumetric reconfiguration or demolition and reconstruction, with or without reduction of the building cubage, widely present within the detailed plans for the renovation of the historic centres in Sardinia. The model can be used to an approximate quantification of the building index to be assigned to each minimum unit of intervention, in order to make the demolition of incompatible volumes and the construction of buildings, in line with the landscape, economically affordable.

In literature, the assessment of the convenience for the transformation of the existing city, according to intensive development models, is connected to the building index attributed to the area, as well as to the relation between the value of existing and newly constructed buildings and the coefficient of the area incidence, which expresses the

positional quality of the property and determines superior feasibility conditions for demolition and reconstruction projects (Micelli, 2014).

In this paper, first of all, a reflection on the proposals for demolition and reconstruction of inconsistent artefacts on site is suggested, without considering the impact of the area on this estimation and assuming that context conditions allow a coherent redistribution of the volumes within the same minimum intervention unit, or even the identification of a solution, compatible with a landscape, also with an increase in the allocated building capacity.

The reasoning is based on the assumption that cost effectiveness is ensured when the value of the reconstructed building is greater or at least equal to the existing one and, at the same time, covers the costs arising from the demolition and reconstruction.

$$Vm_p \geq Vm_E + Kd_E + Kc_p + S_T + O_C + S_G + O_F + P$$

where

Vm_p = market value of the new building

Vm_E = market value of the existing property

Kd_E = demolition costs of the existing property

Kc_p = construction costs of the new building

S_T = technical costs

O_C = building permit fees

S_G = general expenses

O_F = financial expenses

P = profit and taxes

Planning urban transformation through demolition and reconstruction of existing buildings obviously has several criticalities compared to a simple transfer of development rights from unbuilt lands. For the definition of traditional compartments, the building cubage is assigned to a land based on the zoning classification. In case of built areas it is necessary to convert the existing building into buildable volumes, assessing its consistency, state of preservation, condition and use (Stanghellini, 2013.) In assessing the value of the existing building, it is considered appropriate to work through a merit points based procedure (D'Agostino, 2008). In this case, the market value of the existing building can be assessed in a simplified way on the basis of the market price of new residences, by means of a depreciation coefficient relating to the nature and the conservation of the building material:

$$Vm_E = b \times V_E \times v_U$$

where

V_E = existing building volume;

b = depreciation coefficient for age and state of conservation of the building material;

v_U = market value per cubic meter of new buildings.

To assess the feasibility of demolition and reconstruction projects, in addition to the construction costs, further factors should be considered, including demolition costs

of existing building³, project design and management expenses, building permit fees, general expenses and any financial charge and profit.

These factors are estimated here at 25% of the construction costs, although they may actually have a significant impact on the outcome of the operation and require a more generous estimate than the one proposed, which may differ from empirical experience.

For example, primary and secondary urbanization costs may vary considerably in the different municipalities and in the different development areas. Moreover, the municipality could introduce benefits or total exemptions in the payment of concession charges in order to stimulate the requalification.

The process is characterised by a variable complexity depending on the extent of the intervention, the possible transfer of volumes to areas external to the historical centre, the timing of project design, authorisation and subsequent realisation. This factor could have a significant impact on the charges and interest relating to the financing of the operation.

In summary it is believed that:

$$V_p \times v_U \geq b \times V_E + v_U + V_p (c_C + 25\% c_C)$$

where

V_p = designed building volume;

c_C = average construction cost per cubic meter.

The designed building volume is the result of the existing volume, increased for a rewarding coefficient p so as to guarantee the feasibility of the intervention: $V_p = V_E$

Therefore:

$$p \times V_E \times v_U \geq b \times V_E \times v_U + p \times V_E \times 1,25 c_C$$

The formula to evaluate the rewarding coefficient, depending on the variable p , is as follows

$$p \geq b \left(\frac{v_U}{v_U - 1,25 c_C} \right)$$

In the formula the variables, represented by the construction cost and the value of new buildings, can be expressed either in euros per square meter or euros per cubic meter.

The basic cost for the technical realisation of new buildings, defined by the Region of Sardinia for the construction of residential buildings, amounted to € 906.48 per square meter⁴.

The assessment of the depreciation coefficient is crucial to assess the value of the existing building. Different

³ The cost of demolition of buildings with reinforced concrete structures is estimated at €28.85 per cubic meter in 2009 (Regional Price List for public works, available at <https://regione.sardegna.it/j/v/572?s=1&v=9&c=4365&va=x&esp=1>).

⁴ RAS Resolution of the Department for public works in 2014.

tables, for defining the coefficient, are contained in some normative documents, such as the circular of the Ministry of Public Works of 1949 and the Law on Fair Rent no. 399/1998, together with some formulas conventionally adopted in the estimative practice (Cipollotti, 2013). In the draft of the detailed plan it is necessary to study a set of specific coefficients. For the purpose of this essay, we suggest some guidelines that allow for more theoretical reflections on the topic.

Buildings included in the demolition proposals cannot be prior to the 1950s and 1960s, as in this case they would be subjected to protection constraints. For this reason the depreciation is surely less than 40%, regardless of the building.

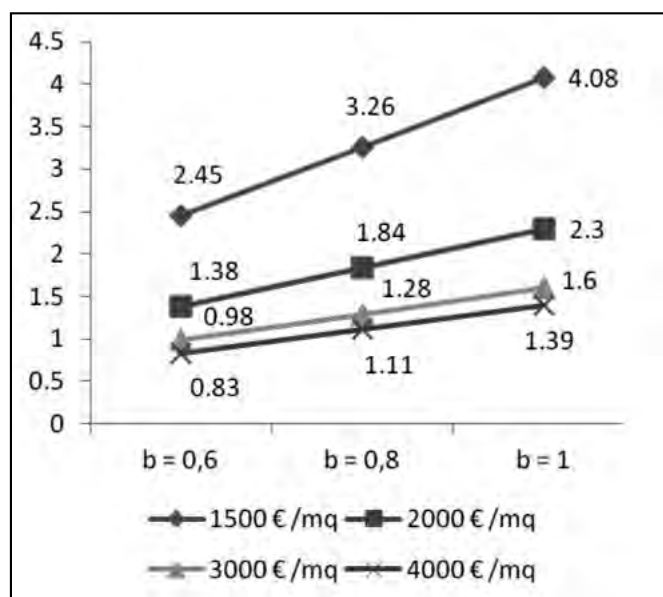


Figure 1 - Rewarding coefficient assessment, based on the market value of new buildings and the depreciation coefficient of the existing one (on the horizontal axis is the factor of depreciation of the existing buildings, on the vertical axis is the awarding coefficient)

Therefore the study is formulated according to different residential market values and three conservation degrees of the existing building structures.

In particular, the depreciation coefficient b is estimated as follows:

- $b = 1$ in case of recent buildings in a good maintenance status
- $b = 0.8$ for buildings in a medium state of conservation but still liveable;
- $b = 0.6$ for obsolete buildings to be renovated.

The table shows some indicative values of the rewarding coefficient, calculated on the basis of the proposed formula, to be used in the definition of building capacity to be allocated to each lot in order to guarantee the feasibility of the demolition and reconstruction proposal.

Each line indicates the value of the rewarding coefficient following the variation of depreciation factor calculated for a specific building quotation.

For obsolete buildings ($b = 0.60$), the reconstruction with a volume equivalent to the existing one, is convenient in case of new residential buildings with a value of at least €3,000 per square meter. In case of urban contexts with real estate prices beyond this threshold, the operation may be convenient even with a reduction of the building volume.

Different considerations arise from assumptions elaborated for low-maintenance habitable buildings ($b = 0.8$), which represent the most widespread category in the settlements. In order to ensure the feasibility of the intervention, it is always necessary to allocate rewarding volumes, even in contexts with considerable appreciation of the properties.

In case of demolition and reconstruction of buildings in excellent condition ($b = 1$), a substantial increase in the buildable capacity is necessary.

In some cases, it is necessary to increase the building capacity to more than 100%, which is supposed to be impossible to use in the same lot. Therefore, the transfer of development rights to an external context is inevitable, resulting in further estimation and management issues for the planner and municipal administration. In particular, a possible transfer of development rights inevitably implies the application of conversion parameters that take into account the different building volumes enhancement in the shift from the sending to the receiving area (Micelli, 2011). The explained reasoning has not taken into account the impact of the area on the value of the existing building and the final one, considering this aspect negligible in case of a development of the building volume completely in the original plot. Transfer involves the need to acquire another lot or to identify a third-party receiving area willing to accept the building development. In either case, this entails an additional burden for the purchase or compensation of the surface right to the owner of the receiving area.

In case of an increase in the existing volume, there is a further question related to the provision of public services (urban standards): in case of limited building extension in the same plot, it is possible to predict a monetisation of the standards, with an increase in the costs incurred by the promoter of the intervention, or it is indispensable to cede standard areas in case of development rights transfer to the areas outside the consolidated city.

5. THE DEVELOPMENT RIGHT WITH A COMPENSATORY AND REWARDING FUNCTION

Considering unlikely an increase in the building capacity on site, in case of demolition of incompatible volumes, the opportunity of transferring the surplus of

development rights into transformation areas outside the historical centre – as identified in the urban municipal plan – is discussed.

The recent national law no. 70/2011 defined the legitimacy of the transfer of development rights by requiring the transcription of their contracts, although the Sardinian urban legislation has not adopted the national provision yet.

The possibility of increasing the volume, as part of the urban planning forecasts, for interventions aimed at the implementation of social housing, urban and building renovation, refurbishment and improvement of the environmental quality of settlements, is already present in the 2008 Finance Law, while many regional laws have introduced mechanisms for the urban plan implementation based on more or less extensive mobility of the development rights in the territory.

For example, the Region of Veneto recognises a development right credit for the demolition of inconsistent buildings, the elimination of degradation elements, and the implementation of measures to improve the urban, landscape, architectural and environmental quality (L. 11/2004.)

Recently there has been the introduction of public-private exchange mechanisms aimed at the renovation of historic centres by some Italian regions including Umbria⁵. The application of these procedures allows for the conversion of the costs for the recovery of public and private historical assets into rewarding development rights to be built outside the perimeter of the historic centre (Lazzarotti, 2010b.) In the legislation on historic centres, new instruments (Strategic Framework for the Enhancement and Priority Revitalization Scenarios) and volumetric rewards have been introduced for the recovery of the historic building, which were granted by local authorities under the powers of local government, in order to be used in development areas outside the historical centre. The development rights bonus, estimated on the basis of the cost of the intervention reduced at least by 30%, acts as an economic incentive and is appropriately calibrated in the municipal plans based on factors such as the size of the historical centre, the land use, parking facilities and real estate quotations (Falco, 2012.)

Moreover, municipal urban plans may provide non-financial compensation for demolition of incompatible buildings, without on-site reconstruction, and for the restoration and refurbishment of spaces to eliminate environmental detractors (Stanghellini, 2013.) These awarding development rights, often defined as credits in regional laws, are characterised by legal autonomy in relation to the land that generated them and whose use is

free in areas designed for transformation and development. A distorted use of the rewarding tool could result in bankruptcy, in the failure of plans or even in profound unfairness in the distribution of the surplus value. Firstly, development rights conferred with a compensatory aim, require a careful estimate on the basis of the value of the alternative monetary allowance: if the value of the development rights is lower than the value of the existing building, the owner would have no interest in adhering to the proposal. On the contrary, if the allowed building cubage is excessive, it would result in questionable or even negatives economic or urban effects (Micelli, 2012). The estimate also requires the identification of a receiving area or at least a district characterised by a homogenous enhancement, in order to guarantee the use of the development rights.

Therefore the development rights, acquired as a compensation or incentive, cannot be reported in the appropriate municipal register without providing a receiving area ensuring their development chances. This also overcomes the numerous legal issues related to the need to guarantee a development right separate from land ownership and the consequent collapse of the right to modify planning provisions for a public interest reason by the local authority (Trapani, 2014).

The role of mechanisms based on the allocation of development rights with a compensatory and rewarding function on the overall urban burden generated by the plan is particularly relevant. This aspect must always be controlled by the general plan, thus the same award mechanisms should be used in a limited way, thus avoiding the use of generic award, such as those for energy saving buildings redevelopment (Veronesi, 2015), which do not allow for a *a priori* quantification of the total development rights generated.

6. TOWARDS THE CREATION OF A MODEL FOR THE ALLOCATION OF DEVELOPMENT RIGHTS REWARDS FOR THE RENOVATION OF HISTORIC CENTRES

For the renovation of the existing building assets, the Region of Sardinia has transposed the national directives by attributing, with Law 4/2009, incentive volumes up to 30% for the renovation, expansion, demolition and reconstruction of existing buildings, to be used in the same lot. These development right rewards have been confirmed by Regional Law No. 8/2015 which introduces additional incentives for the transfer of the existing volumes from areas with high landscape and environmental value or hydrogeological risk. The City Council may grant a bonus up to 40% of the existing volumes by identifying a suitable location. The procedure can also be activated upon request of private owners. Reconstructions in area A are allowed if the current detailed plan agrees while the localisation of new volumes is excluded within 300 meters from the coastline.

⁵ See Law no. 12/08 “Laws for historic centres” and Law no. 13/09 of the Region of Umbria.

The granting of a volumetric incentive up to 40% through a municipal council resolution does not seem to be a useful solution for urban and environmental renovation as the arbitrary quantification of awards, in the absence of in-depth assessments and estimates, may prove to be ineffective or inefficient.

An incentive and volumetric compensation system, structured in a clear and accurate way, has an high-potential for achieving the planning goals and for rethinking the plan structure in response to the new needs. They must be necessarily identified in detail through the assessment of the consequent increase in the development capacity, in order to predict the receiving areas and common facilities.

The detailed planning for the first and ancient centres in Sardinia is definitely an interesting field for experimentation. The study highlighted that the necessary increase in terms of development capacity, in order to make the demolition of the existing volume economically advantageous, is inversely proportional to the value of the real estate market. A volumetric incentive system can definitely be effective in urban areas with a substantial real estate enhancement. Conversely, in smaller centres, the lower real estate quotations may sometimes require an excessive increase in the building capacity or be insufficient to ensure a real demand for new buildings, thus completely affecting the plan objective. A preliminary investigation to verify the presence of a real estate market able to give effectiveness to the incentive program is therefore an indispensable operation.

In a detailed analysis of the urban pattern, the plan must identify the inconsistent buildings with respect to the historic context and classify them on the basis of different levels of incompatibility to which mitigation measures correspond with partial refurbishment operations or, alternatively, proposals for replacement of the existing fabric, with or without volume increase. In this case, the estimated depreciation coefficient is particularly important, which essentially affects the age and status of the existing building. Further development of the research could allow for the development of a detailed set of indicators that would ensure a greater efficiency and equity in the allocation of the development rights in relation to different and heterogeneous factors (physical characteristics, state of conservation, use, incompatibility degree, ownership, impact on the historical context, etc.)

The buildable volume can be partially developed in compatible forms within the perimeter of first and ancient centres in order to reconstruct, where possible, the historic urban layout while the excess volumes are transferred to areas suitable for external transformation in the historic centre, privately owned or made available by the local authority.

In case of private ownership, it will be necessary to provide for additional incentive to cover the cost to acquire the area or to compensate the owner willing to accommodate such volumes. Another solution could be

the creation of a municipal asset of areas for the landing of these rights, which also allows for a further capture of the plus-value and guarantees the ability to develop the building capacity. The free acquisition of the areas can be carried out in ordinary way, through a change in the planning law, introducing a percentage of developable land to be used for the landing of compensatory and premium volumes.

7. CONCLUSIONS

The adjustments of the detailed plans in Sardinia to the PPR is obtaining remarkable results in terms of creation of a detailed knowledge framework on the historical settlement and traditional building typologies of cities and small towns. It is also carrying out the aim of preserving the surviving historical elements. The planning structure and the traditional conservative approach is still too rigid and unable to interpret the ongoing evolution of the urban fabric and its social component. This sometimes results in poorly written prescriptions and proposals for radical intervention by local communities, due to the poor appraisal of the effects on the owners' legitimate interests, which cause processes of abandonment and degradation or, in the worst case, illegitimate building activity.

The need to innovate ways and practices of historic centre planning should be incorporated into a broader framework of municipal town planning instruments, which opens up to a number of issues related to land tenure governance about which debates has been carried out in vain for decades.

There is no point in denying that the planning is often conceived by local communities as an opportunity to gain, in the form of building cubage, neglecting the culture of urban recovery and redevelopment.

The new planning frontiers proposed by a new conception of development right, separated from land ownership, allow for the assumption of its exclusive use for purposes related to urban and environmental redevelopment, applied not only to historical and consolidated urban contexts but also to coastal, natural environments or at hydrogeological risk. For example, development rights could be assigned as an award for the demolition of incompatible buildings located in areas of high cultural and environmental value and reconstruction in areas suitable for development, in support of policies for the recovery of the historic landscape. A similar approach could result in the adoption of new models of development rights recognition in the general plan, structured on several levels⁶: a basic territorial index

⁶ A similar approach has been experienced in the Structural Plan of five municipalities of the Sibaride area in Calabria: Rossano, Corigliano, Cassano all'Ionio, Crosia, Callopezzati (Stanghellini, 2013; <http://www.psasibaritide.it/>).

allocated to the receiving area based on its value; an operational index, which represents the minimum threshold for initiating the transformation process to be achieved with development rights arising out of compensation and rewarding mechanisms; a sustainability index that represents the desirable

threshold to guarantee the technical and economic feasibility of intervention (Stanghellini, 2013). This also provides an effective mechanism to capture urban rent, that results minimised for newly development areas, and largely transformed into volumetric incentives for the urban renovation and recovery of existing building assets.

* **Anna Maria Colavitti**, Associate Professor in Urban and Regional Planning, Department of Civil and Environmental Engineering and Architecture, University of Cagliari.

e-mail: amcolavt@unica.it

** **Sergio Serra**, Architect and Research fellow in Urban and Regional Planning, Department of Civil and Environmental Engineering and Architecture, University of Cagliari.

e-mail: sergioserra@unica.it

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