The National Innovative Program for Housing Quality (PINQuA). Strategies and Indicators for Design Quality

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Abstract. In recent years, the debate on new models of living and experiencing urban spaces has been fuelled by events that have highlighted the fragilities and limitations of the contemporary city, which now appears as a changed reality and which, as a result, must be rethought to find new balances. To respond to the "housing issue" in 2020, an ambitious investment program for the implementation of social housing and urban regeneration interventions throughout the Italian territory was promoted by the Ministry of Infrastructure and Transport (MIT), initiated by the Budget Law 2020, creating a special multi-year fund to support the economic scale of the investments. In the program, called the National Innovative Program for Housing Quality (PINQuA), 159 proposals have been accepted for funding, counting more than 900 redevelopment and new construction interventions, involving 15 thousand housing units for a total funding of 2.8 billion euros. The projects were evaluated by a High Commission through scoring in compliance with seven criteria with the help of a matrix composed of several indicators capable of measuring different project impacts. This paper aims to describe the program content, evaluation process and results achieved by PINQuA.

Keywords: Smart City · PINQuA · PNRR · Strategies · Indicators

1 Introduction

In recent years, there has been a gradual increase in the number of households living in absolute poverty in Italy: the incidence has risen from 2.5% in 2005 to 7.5% in 2021, affecting about 5.6 million individuals (ISTAT, 2022). Poverty is a condition closely linked to the economic condition in which families live, consequently it is also connected with the quality of housing condition. On average, the monthly rent of a family in absolute poverty amounts to about 330 €, accounting for 35.9% of total expenses, being significantly higher than the one of families not in state of poverty (1) (ISTAT, 2022). The housing issue is also conditioned by other dimensions that define discomfort (2) and which concern, in addition to the level of decay, the presence of humidity and poor lighting in buildings, elements that combine to affect the healthiness of housing. A further issue related to housing is the widespread condition of overcrowding. In fact,

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in Italy, 28% of the population lives in densely inhabited houses, a figure that is far behind the European average (17%). It is then necessary to point out the decline in public spending on housing hardship support in Italy, which is higher than the average in other European countries. To respond to the growing difficulties developed by housing hardship, the Budget Law 2020 launched the National Innovative Program for Housing Quality (PINQuA), promoted by the Ministry of Infrastructure and Transport (MIT), with the creation of a special multi-year fund to support investment in the sector (MIMS, 2022). The PINQuA, established under Paragraph 437 of Article 1 of Law No. 160 of Dec. 27, 2019, and regulated under I.D. No. 395 of Sept. 16, 2020, is focused on overcoming the monofunctional features typical of 20th century metropolises, and aims to create a new vision of a more fluid, connected and inclusive city. The Program aims to pursue the urban model of the already known smart cities through processes of urban regeneration and reduction of housing and social distress, favoring degraded portions of the territory and revitalizing the suburbs. Urban regeneration refers to all transformation action that affect the structure and use of the city, implying not only spatial and physical changes but also economic, social cultural and creative changes (Galdini, 2008). In Italy, urban regeneration represents in many ways the latest step in a legislative and programmatic path (Mariani, 2022), necessitating a radical transformation in the daily use of spaces (Bernardoni, 2021); in this regard, the Program defines a form of living that aims to move away from the systematic pattern of housing understood as a place to dwell, favoring a model of integrated social living aimed at fostering new networks and transversal ties, redesigning not only housing, but also the spaces available to housing and, therefore, to the city. In line with this approach, PINQuA aims not only to reduce housing and settlement discomfort in the strict sense, but also to positively affect the quality of life of the population through solutions that show themselves durable over time, encouraging the use of innovative models and tools of management, social inclusion, cultural enrichment and quality of artifacts, and support for urban welfare (MIMS, 2022).

2 Contents and Structure of the PINQuA Call for Proposals

PINQuA follows a multilevel governance approach and involves public administrations, which are called upon to plan and submit proposals with the aim of providing concrete responses to the needs of their communities and territories. The proposing entities are Regions, Metropolitan Cities, Provincial Capitals, and Municipalities with more than 60,000 inhabitants. The projects submitted followed the five lines of action provided by the Program referring to: redevelopment and reorganization of the heritage intended for social housing, with an eye to the re-functionalization of areas, spaces and public and private properties including through the regeneration of the urban and socioeconomic fabric and temporary use (MIMS, 2022). One of the main lines of action of the Program concerns the regeneration of areas, spaces and properties that have already been built, to align with the principle of zero land consumption, minimizing the artificialization of urban areas (Ministry of Environment and Energy Security, 2022) also a cornerstone of the Plan for Ecological Transition (3). Regeneration of the socioeconomic fabric, cultural enrichment, improvement of social cohesion, and quality of artifacts, places, and citizens' lives must be durable solutions that all interventions aim to follow, with a view to innovation and sustainability (United Nations, 2015).

The submission of proposals identified two types of interventions i.e., ordinary projects and pilot projects with high strategic impact. The difference lies in the different scale and relevance of the field of intervention: interventions envisaged as pilot projects, in fact, must assume a high strategic impact on the national territory, while ordinary projects must identify a more local scope of intervention, with reference to peripheral areas or areas that present situations of housing and socioeconomic distress and lack adequate urban-local equipment (MIMS, 2022). The size gap between the areas of intervention has a direct reflection on the amounts of funding; ordinary projects could be funded for a maximum of 15 million euros, whereas pilot projects could be up to 100 million euros. Another important difference between the types of proposals concerned the definition of the project to be submitted: while for ordinary projects a level comparable to a Technical and Economic Feasibility Project (PFTE) was sufficient (4), for high performance pilot projects the degree of definition required was the final project.

In addition to the required graphical drawings and administrative and financial documents, a special template containing project responses to physical and impact indicators was required at the proposal submission stage. In fact, in addition to the identification of the project's main data, the values of the indicators were identified so as to bring a summary judgment of the project's overall performance. In total, the number of indicators is 30, divided into 6 groups, defined as in Table 1 below:

Table 1. Physical and impact indicators found in the "PINQuA Sheets".

Indicators	Description
Environmental impact indicators	Energy sustainability, energy efficiency, environmental remediation, material resource consumption and regional resource use
Social impact indicator	Public areas, public buildings, security for garrison, security for inclusiveness, and senior citizen services
Cultural impact indicators	Restoration and enhancement of captive properties, basic educational services, higher educational services, basic entertainment services or facilities, and cultural services or facilities
Urban-territorial impact indicators	Open areas, permeable surfaces, pedestrian and bicycle paths and public mobility
Economic-financial impact indicators	Private funding, employment gains from the project, parametric cost of outdoor areas, parametric cost of the built environment. chrono-economic indicator i.e., ratio of time to cost
Technological impact indicators	Innovative tools and methods, innovative actions and processes, innovative management models, and reversibility of the intervention or technical elements

The introduction of PINQuA within the PNRR's planned investments led to a significant increase in the funds dedicated to the Program. The latter initially foresaw

resources of 853.81 million euros, guaranteeing the funding of at least one proposal for each Region to which the proposing party belongs (MIMS, 2022), allocating at least 34% of the resources to interventions from areas in the South (5). Thanks to the inclusion in Mission 5, Component 2 of the PNRR (6), an additional 2.8 billion allocated to the Program was made available, increasing the number of nationally funded works and bringing the resources for the South Italy to 40%.

3 The Set as a Tool for Selection and Evaluation of Proposals

The evaluation process of the proposals submitted in the first phase of the Program was carried out by the High Commission (7). Indicators are used in a wide variety of evaluation applications (Martini, 2002) and, in this case, were useful in the construction of the ranking of proposals. Each set of impact indicators corresponds to an evaluation criterion with which, in turn, a maximum score is associated, as stipulated in the Call for Proposals. An exception to this are the economic-financial impact indicators, which are divided between two different criteria (Table 2). Within each criterion, the indicators take on different specific weights, and the sum of the score obtained in each criterion determines the proposal's final score, for a maximum of 100 points.

The score associated with each criterion is the result of the sum of the scores obtained in the individual indicators by linear interpolation: the value obtained for each indicator was normalized against the maximum observed value and then weighted against the predetermined weights. For dichotomous indicators (Yes/No), on the other hand, the relevant weight was assigned in case of presence and a null score in case of absence of the specific characteristic, operating no normalization (MIMS, 2022).

In this way, a theoretical matrix composed of the 30 indicators is generated for the total number of proposals capable of assessing the multiple performance aspects of the interventions (Baratta et al., 2021), from which the final ranking of the proposals emerged. This method made it possible to carry out an evaluation by assigning scores to the proposals consistent with the seven criteria previously identified in Article 8, paragraph 1 of Ministerial Decree 395/2020.

Table 2. Impact of criteria on the evaluation of proposals.

Score (max)	Criterion	Indicators
15 points	Criterion A	Environmental impact indicators
25 points	Criterion B	Social impact indicators
10 points	Criterion C	Cultural impact indicators
15 points	Criterion D	Urban-territorial impact indicators
15 points	Criterion E	Economic-financial impact indicators
10 punti	Criterion F	
10 points	Criterion G	Technological impact indicators

The assessment made for each group of indicators considers the quality of the proposal and consistency with the purposes envisioned by the PINQuA.

Going into the details of each criterion, the following is specified. For the judgment on criterion A (Table 3), the ability to develop responses to the needs and requirements expressed, the presence of innovative and green economy aspects, the compliance with the Minimum Environmental Criteria (CAM) and the ability to aggregate subjects in an associated form in the key of legality of self-consolidated realities (MIMS, 2022) were evaluated with a maximum weight of 3 units per indicator.

Table 3. P Weight given to environmental impact indicators.

Indicator	Unit of measurement	Attributed weight (max)
Energy Sustainability	0–5	3
Energy efficiency	0–5	3
Environmental remediation	m^2	3
Reduction of material resource consumption	m^3/m^3	3
Regional resource use	m^3/m^3	3

Criterion B consists of the social impact indicators (Table 4), designed to measure the extent of works involving public housing properties, favouring interventions that fit into the most critical contexts of greatest housing tension (Baratta et al. 2017). In terms of social mixitè and diversification of housing supply, the social impact indicators are based on an additional benchmark, namely, on the level of integration both with the context and with interventions related to social housing properties, with reference to the implementation of specific regional policies. As in Criterion A, the weight given to these indicators (Table 4) is a maximum of 3 points.

Table 4. Weight given to social impact indicators.

Indicator	Unit of measurement	Attributed weight (max)
Public areas	m^2/m^2	3
Public buildings	m^2/m^2	3
Security by garrison	m^2/m^2	3
Senior citizen services	m^2/m^2	3
Security by inclusiveness	n. assoc./m^2	3

Criterion C was evaluated on the responsiveness of the cultural impact indicators (MIMS, 2022) designed to measure the work by its capacity to enhance cultural, environmental and landscape assets. This is by rehabilitation and reuse of such assets in the area are cardinal principles of the Program. Criterion C, composed of 5 indicators to

which a maximum weight of 2 points is given, totals a maximum score of 10 points (Table 5).

Table 5. Weight given to cultural impact indicators.

Indicator	Unit of measurement	Attributed weight (max)
Asset recovery and enhancement	Yes/No	2
Basic educational services	m^2/m^2	2
Higher services	m^2/m^2	2
Basic entertainment services or facilities	m^2/m^2	2
Cultural services or facilities	m^2/m^2	2

The evaluation of criterion D was carried out through the urban-territorial impact indicators (Table 6), through which it was possible, in addition, to measure the project's focus with respect to the zero balance of land consumption. These indicators turn out to be related to the type of intervention, favoring interventions of rehabilitation and redevelopment of already urbanized areas, or existing buildings, taking into account the significance of the interventions themselves in terms of seismic safety and energy upgrading, including through their demolition and reconstruction (MIMS, 2022). Criterion D, moreover, considers the quantity and quality of open spaces in the proposals, evaluating the attention that is given in the external works and in the use of sustainable road systems.

Table 6. Weight given to urban-territorial impact indicators.

Indicator	Unit of measurement	Attributed weight (max)
Vacant area	m^2/m^2	3
Green area	m^2/m^2	3
Pedestrian way	m^2/m^2	3
Bicycle pathway	m^2/m^2	3
Public mobility	m^2/m^2	2

Criteria E and F (Table 7) were evaluated on the responsiveness of economic-financial indicators. Specifically, the first among them responds to the group of indicators that measure the extent of construction costs (both built and outdoor areas) and the activation of additional economic resources of a private or public nature. The remaining economic-financial indicators, integrating the basis for a development of cost-benefit analysis (Acampa et al. 2022), constitute criterion F, by which the involvement of private operators, including from the third sector, is assessed, with involvement and direct participation of stakeholders also in associative form, especially if they operate in the area of intervention (MIMS, 2022).

Table 7. Weight given to economic and financial impact indicators.

Criterion E		
Indicator	Unit of measurement	Attributed weight (max)
Private financing	€/€	5
Employment indicator	n./m^2	4
Parametric cost of outdoor areas	€/m^2	3
Parametric cost of built	€/m^2	3
Criterion F		
Indicator	Unit of measurement	Attributed weight (max)
Chrono-economic indicator	€/months	7
Number of private and third sector operators involved in the proposal	n.	3

Finally, dichotomous indicators of technological impact were measured for the evaluation of criterion G (Table 8) by examining whether BIM methodology, as well as innovative measures and models of management, social support and inclusion, urban welfare, and proposal activation (MIMS, 2022) were used in proposal writing.

Table 8. Weight given to technology impact indicators.

Indicator	Unit of measurement	Attributed weight (max)
Innovative tools and methods	Yes/No	2
Inclusive actions and processes	Yes/No	2
Innovative products and solutions	Yes/No	3
Innovative management models	Yes/No	3
Reversibility of the intervention or technical elements	Yes/No	1

Following the High Commission's evaluation of the proposals, 93.5% of the requests were considered eligible for funding, an incidence that equates to 271 proposals for a total amount of €4.2 billion: with the resources available under Ministerial Decree No. 383 of 07.10.2021, 159 proposals were actually funded for a total of €2,820,007,520 (Baratta, 2022).

4 A Summary of the Economic Data of the PINQuA Proposals

In addition to the execution of the works, technical expenses for design, verification, validation, construction management and testing are eligible for funding. In this regard, the proposing parties were obliged to submit an economic and financial framework of

the works with an attached technical administrative timetable. The composition of the economic framework had to include, in addition to the costs of works and supplies, technical expenses, expenditure related to any purchases of land and expropriations, and other expenses that could not be financed (such as urbanization and management charges). In addition, in sizing the economic resources needed to carry out the intervention, additional financing from other public sources or from the developer's own resources or other private sources could be considered. Additional economic data, mainly related to construction costs, can be transposed through the analysis of the economic-financial impact indicator. This indicator, in fact, makes explicit the parametric costs of construction of building interventions and construction of outdoor areas, which can be identified through the ratio of the total cost to the areas related to them. The following Table 9 summarizes the data of the economic-financial indicator, highlighting the parametric construction data, as well as information on the number of new activities included (services, commercial and other activities) and the estimated time for the realization of the intervention.

Table 9. Detail of economic and financial impact indicator data.

Indicator Description	Description project	Quantity
Private funding indicator	Description funding	Amount €
Overall financing indicator		Amount €
Employment indicator	Description of activities included	Amount no. New activities
Employment indicator (area)		Amount m^2
Indicator of total cost of interventions planned for outdoor areas		Amount €
Indicator surface area of outdoor areas		Amount m^2
Indicator of the parametric cost of outdoor areas		Amount €/m^2
Indicator of the total cost of planned investment in the built environment		Amount €
Indicator surface area of built-up area		Amount m^2
Indicator of the parametric cost of the built		Amount €/m^2
Chrono-economic indicator	Description of estimated time for implementation (months)	Amount €/month
Indicator of private and third sector operators involved in the proposal	Description of operators	Amount no. Operators

Analyzing the distribution of funding across the Italian territory (Fig. 1), the following can be seen:

a. the South was allocated about 1.1 billion euros, or 40.1% of total funding (MIMS, 2022).
b. about 1 billion euros (37.9%) has been allocated to the North.
c. 618 million euros (22%) are earmarked for the Center.

This allocation of funds corresponds to a distribution of interventions (159 proposals), as follows:

a. South and North receive 60 proposals each (equivalent to 37.7% of the works each).
b. the remaining 39 proposals are in the regions of Central Italy, totaling 24.5% of the interventions (MIMS, 2022).

Given the nature of the Program and, consequently, the subjects it was aimed at, the main beneficiaries were municipalities, to which 72% of the investments were allocated, i.e., 114 interventions, of which 98 are ordinary and 6 are pilot projects; the remaining share is attributed to Regions and Metropolitan Cities, totaling 18% and 11%, respectively (MIMS, 2022).

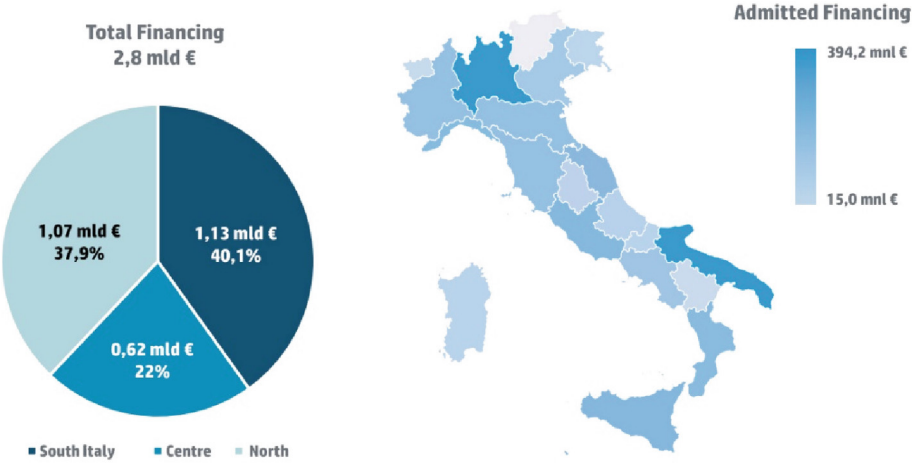


Fig. 1. Spatial distribution of economic resources.

5 Conclusions: A Summary View of the Winning Projects

Some recent regulatory provisions, in particular the so-called Simplification Decree 2021, converted into Law No. 108 of July 29, 2021, provide that, in relation to procedures pertaining to public investments financed, in whole or in part, with the resources provided by the PNRR and the programs co-financed by the European Union Structural Funds, by way of exception to the provisions of paragraphs 1, 1-bis and 1-ter of the Contracts Code,

the awarding of design and execution of the related works is also allowed on the basis of the PFTE. The inclusion of the PINQuA within the Missions of the NRP entailed, in addition to the increase in economic resources, a partial revision of the procedure, namely:

– elimination of the second stage of document integration, consistent with the contents of Article 48, paragraph 7, of Decree-Law No. 77 of May 31, 2021, converted into Law No. 108 of July 29, 2021.
– remodulation of the proposal and timetable of the works, consistent with the requirement to conclude the works by January 31, 2026 (Baratta, 2022).

Recalling that one of the objectives of the Program was to favor all those interventions that include actions of recovery, redevelopment, or densification of already urbanized areas, consequently limiting the expansion and use of new land, thus achieving a "zero balance" result (MIMS, 2022), the Program presents only a 2% area of new construction. In fact, the total area of intervention exceeds 14 million square meters, 52% of which is in the southern regions, where only 434,478 square meters are of new construction. Regarding redevelopment interventions, it should be noted that the South is more involved by reaching an important percentage of the existing area to be redeveloped compared to how much is planned nationally (51%) (MIMS, 2022).

With a view to a Low-Density Construction and Urban Regeneration Program, a particular effort on the part of project submitters has been to focus attention on the design of outdoor areas. In fact, nationwide, the area of vegetated open area exceeds 8 million square meters, accounting for 63% of the total open area of interventions. In this, too, the area of the Southland directs the highest percentage of area, 56%, compared to 68% of the total uncovered area. Public spaces cover an area of nearly 10 million square meters (MIMS, 2022) of which, 84% is for outdoor public areas with the function of socialization.

A total of 1.3 million square meters are allocated to the residential area, on which more than 16 thousand housing units are involved, both for redevelopment and new construction, having an average size of 81 square meters per housing unit. Taking the figure back to the national level, 39.8% of these housing units are planned in northern regions (about 6,600 units), 33.2% (5,500 units) in southern regions and 27% (4,500 units) in central Italian regions. MIMS has estimated, based on data provided by Federcasa-Nomisma (8), that the average monthly savings per dwelling in terms of rent, compared to free market prices, amounts to about 479 euros per household (estimate made based on the average size of housing equal to 81 square meters). Still in residential terms, another feature included in the Program's rewarding criteria is the energy efficiency of existing buildings. When considering all interventions eligible for funding, an average energy class advance of about 4 classes was estimated, corresponding to an improvement in annual energy performance of 38% (MIMS, 2022). In this regard, in addition to energy efficiency interventions, many of the projects also include the installation of energy systems from renewable sources in order to ensure an adequate level of energy autonomy of buildings and to help increase the use of renewable sources in cities. Specifically, 60% of interventions include the installation of systems involving at least two renewable sources: 153 interventions involve solar, 59 hydro, 44 geothermal, 24 wind, and 23 biomasses (MIMS, 2022).

Finally, in the Program's view of intervening at the social level in cities, a share of 756,000 square meters is allocated for educational activities involving both childhood and secondary or university education, while about 788,000 square meters is allocated for cultural activities, such as museums, exhibition spaces, libraries, etc. (MIMS, 2022) and to entertainment activities such as theaters, cinemas, or concert spaces. Figure 2 below shows a summary overview of these areas dedicated to cultural and social enrichment nationwide.

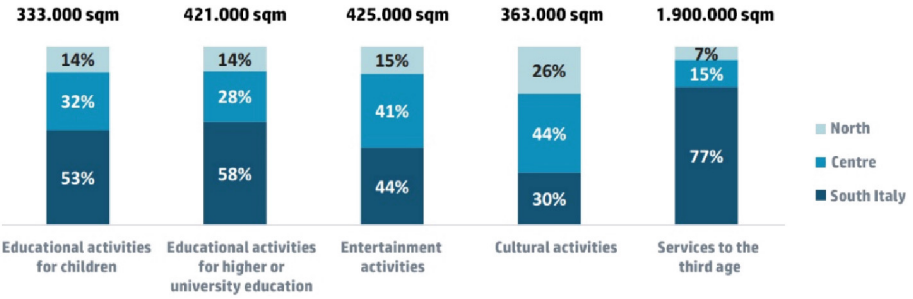


Fig. 2. Surfaces designated for educational and cultural activities.

The ambitious Program aims to intervene throughout the entire national territory, assuming considerable significance, which could have a great impact in transforming the face of the suburbs of many Italian cities (Mariani, 2022) and, by March 2026, Italy has made a commitment to intervene on more than 10,000 housing units and 800,000 square meters of covered and uncovered public spaces (Baratta, 2022).

As the application of PINQuA continued, it was possible to identify certain limitations of the system, both intrinsic and extrinsic in nature. One of the main intrinsic limitations relates to the use of measurement scales articulated in a few steps, which led to an increase in accuracy at the evaluation stage, reaching the fourth significant figure. As the project level advances, a significant difference can be produced between the outcome of the ranking and the performance guaranteed at the preliminary stage, demonstrating an extrinsic limitation that lies in the contingency of the proposed set.

6 Note

(1) The average incidence of rent as a percentage of total spending, which stands at 22.3 percent.
(2) Discomfort studies are a branch of building diagnostics that involves identifying the causes responsible for perceived comfort deficiencies within dwellings (INAIL, 2018).
(3) Plan for Ecological Transition (PTE), approved under Article 57-bis, paragraph 3 et seq. of Legislative Decree No. 152 of April 3, 2006.
(4) In Italy, design levels are regulated by Article 23 of Legislative Decree No. 163 of April 12, 2006, on "Code of public contracts for works, services and supplies"; latest updates: Law No. 122 of 2016, Ministerial Decree No. 248 of 2016. The

aforementioned article defines three levels of design, which in turn define the process of implementation of an intervention, identifiable as the Technical and Economic Feasibility Project, the Definitive Project, and the Executive Project.

(5) In South Italy, based on ISTAT classification, refers to the regions of Abruzzo, Basilicata, Calabria, Campania, Molise, Apulia, Sardinia and Sicily; North refers to the regions of Liguria, Lombardy, Piedmont, Valle d'Aosta, Emilia-Romagna, Friuli-Venezia Giulia, Trentino-Alto Adige and Veneto; Centro refers to the regions of Lazio, Marche, Tuscany and Umbria.

(6) M5C2: social infrastructure, families, communities and the third sector.

(7) The high commission was appointed by the Minister's Decree referred to in Article 1, Paragraph 439 of Law No. 160 of December 27, 2019.

(8) Italian Federation for Housing and Social Housing (www.federcasa.it/).

References

1. Acampa, G., Finucci, F., Grasso, M., Magarò, A.: Preliminary approach for the cost-benefit analysis in the building envelope: study and comparison of actions. In: New Metropolitan Perspectives: Post COVID Dynamics: Green and Digital Transition, between Metropolitan and Return to Villages Perspectives, pp. 786–794 (2022)
2. Baratta, A.F.L.: Una nuova visione dell'abitare e degli spazi dell'abitare nel PNRR. TECHNE-J. Technol. Architect. Environ. **24**, 15–20 (2022)
3. Baratta, A.F.L., Finucci, F., Magarò, A.: Generative design process: multi-criteria evaluation and multidisciplinary approach. TECHNE-J. Technol. Architect. Environ., 304–314 (2021)
4. Baratta, A., Calcagnini, L., Finucci, F., Magaro, A., Molina, H., Ramirez, H.S.Q.: Strategy for better performance in spontaneous building. TECHNE-J. Technol. Architect. Environ., 158–167 (2017)
5. Bernardoni, A., Cossignani, M., Papi, D., Picciotti, A.: Il ruolo delle imprese sociali e delle organizzazioni del terzo settore nei processi di rigenerazione urbana. Indagine empirica sulle esperienze italiane e indicazioni di policy. L'impresa Sociale, un pilastro per le politiche **3**, 7–17 (2021)
6. Galdini, R.: Reinventare la città: strategie di rigenerazione urbana in Italia e Germania. Franco Angeli, Milano (2008)
7. ISTAT: Report povertà in Italia. https://www.istat.it/it/files/2022/06/Report_Povert%C3%A0_2021_14-06.pdf. Accessed 16 Mar 2023
8. Mariani M.: Intervista a Elena Germana Mussinelli. La rigenerazione urbana: una bussola per la qualità della vita. CIL **188**, 42–45 (2022)
9. Martini, A., Sisti, M.: Indicatori o analisi di performance? Implicazione dell'esperienza statunitense di performance measurement. www.uniurb.it/nucleovalutazione/NdV/ReR/Performance_Measurement.pdf. Accessed 15 Mar 2023
10. MIMS: Rapporto del Programma Innovativo Nazionale per la Qualità dell'Abitare. Progetti e prime evidenze. www.mit.gov.it/nfsmitgov/files/media/notizia/2022-06/Report%20PINQuA.pdf. Accessed 18 Mar 2023
11. Ministry of Environment and Energy Security: Piano per la transizione Ecologica. https://asvis.it/public/asvis2/files/Eventi_ASviS/PTE_definitivo.pdf. Accessed 20 Mar 2023
12. Unite Nations: Sustainable development goals. https://www.un.org/sustainabledevelopment/sustainable-development-goals/. Accessed 20 Mar 2023