

Urban regeneration of public housing settlements, in Rome: the case study of San Basilio district

Angela Calvano , Andrea Canducci* , and Andrea Rufini 

Department of Planning, Design, Technology of Architecture, Sapienza University of Rome, Via Flaminia 72, 00196 Rome, Italy

Received: 22 November 2022 / Received in final form: 28 June 2023 / Accepted: 29 June 2023

Abstract. The issue of urban regeneration has taken a strong centrality in recent European and national debates, particularly applied in the transformation of suburban settlements. Urban regeneration practices represent a potential tool to steer transformations toward criteria of environmental sustainability and resilience, resulting in reduced land consumption from decreased demand for new urbanization, and increased urban quality and collective well-being. The redevelopment of public housing requires a comprehensive rethinking of its use pattern and integrated and social cohesion tools to act with targeted measures in situations of marginality and physical, social and economic degradation. Working on these pieces of the city becomes fertile ground and a catalyst for opportunities in terms of regeneration of the urban fabric, with benefits and positive impacts, from the local level to a broader scale, driving ambitious measures to combat climate change. The research, articulated on closely related layers – public space and private space, outdoor space and indoor space – from the urban to the architectural scale aims to formulate meta-project guidelines applied to the case study of San Basilio, a suburban settlement of public housing within the city of Rome.

Keywords: Regeneration strategies / multiscale approach / multi-system methodology / renewables energy

1 Introduction

The issues of environmental sustainability and sustainable development of cities have permeated the debate in Europe and Italy over the past few years, since the stabilization of the population from a numerical point of view has corresponded to the shift from the principle of expansion to that of urban densification [1].

Within this debate, the European Commission, has drafted the document No Net Land Take 2050, addressing the issue of land consumption and defining new priorities related to the environmental, social and economic crisis starting with actions on soil, water and multifunctionality, identifying compactness of urban cores and reduction of ecological footprint as the way forward for future sustainable development [2].

In this context, urban regeneration practices become a potential tool for directing transformations towards criteria of environmental sustainability: reuse of abandoned urban soils and degraded buildings, reduction of demand for new urbanization, particularly in suburban areas, resulting in reduced land consumption and increased attractiveness of the dense city [3]. Working on the

consolidated city involves changes, from the local level to a broader scale, and it becomes, moreover, fertile ground and a catalyst for opportunities in terms of regeneration of the urban fabric, driving ambitious measures to adapt, mitigate and combat climate change [4].

With the current socioeconomic and environmental crisis, the concept of urban welfare with its related policies is opening up to the collective well-being, applied to different spheres. With this in mind, recent European strategic directions¹ are pushing for integrated projects, actions and policies relevant to both sustainable regeneration and more efficient urban management with new inclusive economies, subsidiarity, participation, territorial and social cohesion and innovation [5].

The theme of the regeneration of parts of cities has taken on a strong centrality in recent European experience in particular in the transformation of suburban areas that

¹ In January 2020, the European Commission launched the ambitious European Green Deal, consisting of a series of measures aimed at: making the continent climate neutral (with zero net greenhouse gas emissions) by 2050; supporting the ecological transition; and “building a fairer, healthier and more sustainable future for future generations” (Ursula von der Leyen, president European Commission).

* e-mail: andrea.canducci@uniroma1.it

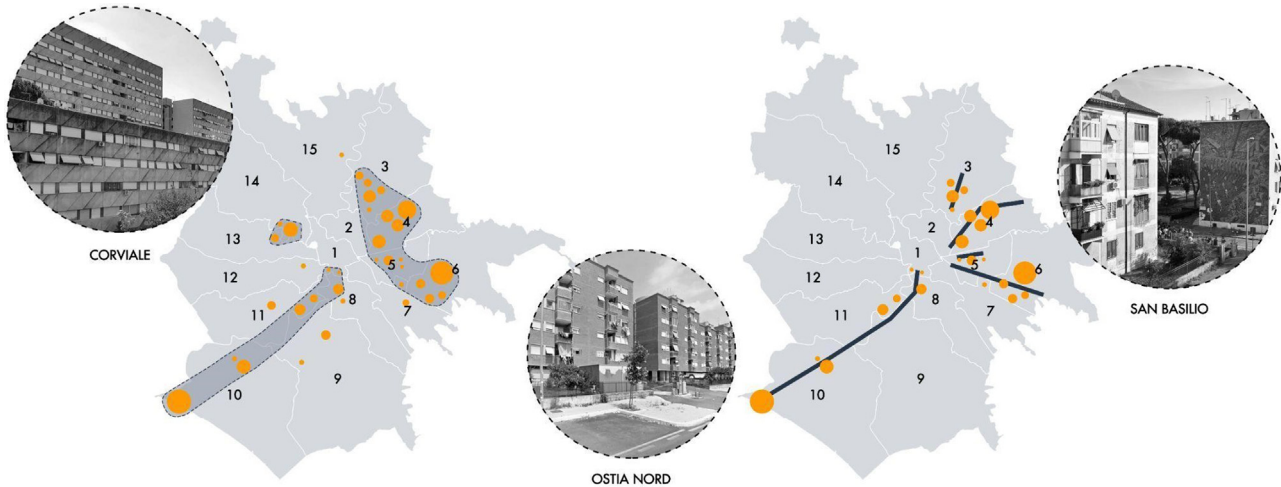


Fig. 1. Road axes of development of public housing districts, Rome.

include areas of expansion and completion around historical cores, abandoned interstitial and industrial areas, public housing settlements. Even in Italy, the suburbs of large metropolitan areas require regeneration interventions particularly in those numerous cases that represent the failure of an idea of the city based on the belief that the urban and building models chosen for the formation of large settlements on the edge of the consolidated city had the capacity to interpret the development of the future city in a positive key [6].

The redevelopment of public housing cannot be separated from an overall rethinking of its pattern of use: housing and public services represent a strong instrument of integration and social cohesion available to the public administration to act with targeted measures in situations of marginality or physical, social and economic degradation. In this context, possible actions related to the promotion of the improvement of suburban settlements and its buildings represent the synthesis of all components of energy, environmental, economic and social sustainability, through an open dialogue between citizens, politicians, technicians and stakeholders to assess impacts under different perspectives [7].

2 Context

Today the perception of the city has profoundly changed. Several sociologists now consider the binomial center/periphery exceeded. Speaking of suburbs, according to the original sense of marginalized place – outside the center, beyond the margin – is an alteration of reality when the prevalence of urban settlements is suburbs. Marginalization, which characterizes such contexts, no longer refers to the physical condition of being beyond the margin, but considers it a complex condition in which economic, social and environmental aspects come into play [8]. In the Roman case, at present, to a historic center that gradually empties of residents, to give way to tourism and trade, are opposed to the processes of gentrification that characterize the consolidated city, even in areas historically considered degraded [9].

The city of Rome has undergone a process of transformation of its economic, demographic and social structure since the post-war period, as a result of significant urbanization. Housing was one of the problems to be solved, and the lack of programming and planning had as a direct consequence the creation of public housing districts characterized almost exclusively by housing, but not integrated with transportation infrastructure, nor services. The endowments of primary services, to date, have been secured, but not a mobility network capable of ensuring efficient travel and accessibility, thus a viable public transport network and an adequate road network. Urban quality is the missing element [8].

Many neighborhoods in the city of Rome have such close relationships with each other that they can be considered as continuous systems. In particular, 3 macro areas can be identified (Fig. 1):

- the Northeast-East area, in which the subsystems determined by the road development axes of via Tiburtina, via Prenestina and via Casilina emerge;
- the expansion area towards the sea, South-West, with the axes of via Ostiense and via del Mare;
- the decidedly more modest Northwest area, consisting of the neighborhoods of Primavalle, Palmarola, Fogaccia [10].

The neighborhoods of Corviale, Ostia Nord, and San Basilio, although they were built in different periods, are those with a higher concentration of public housing and characterized by particularly significant socioeconomic hardship that has lasted over generations.

Corviale, nicknamed “Serpentone,” with 1275 housing units allocated in 1984, was supposed to represent an alternative housing model. The common spaces, which were supposed to house social and economic functions, were partly squatted. On the coast, the Nuova Ostia neighborhood – which corresponds to the Ostia Nord urban planning area – has 3592 social housing units. This includes 1500 housing units, the so-called “sand houses,” built since the 1970s to give a home to the inhabitants of the Mandrione and Acquadotto Felice boroughs under demoli-

tion. San Basilio has 3,986 council houses. One of the official boroughs of the 1930s, abusively developed in the early postwar period, it was rebuilt with funds from the Romita Law (1954) and became the protagonist, between 1963 and 1974, of the historic housing struggles [11].

The public housing that distinguishes such contexts, built by pouring great faith in technological progress and industrialization, today suffers from the limitations arising from the speed of construction, the use of shoddy materials, and the failure to consider possible energy savings, but also from the lack of attention to social impact [8].

3 Methodology

The present thesis research, conducted within the PDTA Department, Faculty of Architecture – Sapienza University of Rome, adopts an integrated, multiscale and multi-system methodology, in order to obtain awareness of the applied strategies of urban regeneration. The approach used connotes a design quality capable of expressing the relational factors inherent in each place and with which the regeneration project must necessarily confront and interpret in order to ensure a development consistent with the identity of the context of intervention [12]. The recognition of the multiscalar and multisystemic dimension of urban contexts emphasizes the need to conceive transversal, flexible and relational design logics, in which the configurative quality of a project results from a process of critical interpretation of the context and its multiform transformative dynamics.

Multiscalarly makes it possible to look at physical space as an interaction between space and society, in which scale and dimension define the nature of urban phenomena but also potential intervention strategies [12]. It is through the search for coherence between the various levels of intervention that a fundamental reflection on the quality of the city and its growth processes is exercised [13].

In order to arrive at a new model of urban development and the consequent urban regeneration of suburban settlements, holistic approaches are needed to acquire and integrate different forms of knowledge and data from a wide range of disciplines and perspectives, an integrated and multi-sectoral approach to the design and implementation of improvements in the urban environment [14].

The research articulates closely related layers – public space and private space, outdoor space and indoor space – from the urban to the architectural scale to formulate meta-project guidelines to be applied to the case study: San Basilio, a suburban public housing settlement within the city of Rome.

The methodology adopted is based on an inductive and deductive process of analysis to bring out a framework of resources and critical issues, aimed at planning interventions, at the level of urban space and the built environment, aimed at increasing levels of well-being, social inclusion, and economic development in realized public housing neighborhoods that exhibit severe social and environmental hardship.

The regeneration project is based on understanding the complex and articulated structure of the urban context, through the analysis of macro-systems, from the large scale to the building scale:

- socioeconomic and demographic analysis, defines the identikit of those who inhabit the urban context under study, dwelling on marginality, fragility and social distress;
- built environment analysis, identifies the characteristic elements to be maintained and enhanced and those to be adapted and/or adjusted to current needs;
- services and activities analysis, provides insight into the quality of life of residents and eventual users;
- rail, road and sustainable mobility analysis, defines the degree to which the complex is connected and integrated with the urban system;
- natural environment analysis, measuring the quality of life and defining the presence of vegetation that contributes to combating overheating, absorbing CO₂, and purifying the air;
- microclimatic conditions and sunlighting analysis, provides insight into the effects of climate change on the environment and people.

The purpose of the macro-systems analysis is to arrive at a strategic planning, defining the strengths and weaknesses, opportunities and threats – SWOT analysis – for each component studied. This matrix is the starting point for the construction of a planning vision, identified in the meta-project, which makes a synthesis between objectives to be pursued, strategies to be implemented, technological and economic constraints, in order to achieve urban regeneration in a sustainable and resilient key in a medium to long term perspective.

4 Case study

The case study concerns the district of San Basilio, the suburban popular district, in the north-east quadrant of the city of Rome, which is degraded and the site of episodes of delinquency. The neighborhood is a context on which the municipal public administration is focusing recently: a reality very different from the stereotype of the neighborhood, in the hands of drug watchmen and clans, that emerges from the investigations on drug trafficking in the Capital. The neighborhood is also social, cultural, mutualism and recovery of abandoned spaces: the other side of a solidarity borough that fights against social hardship and poverty, in an area where the rate of school drop-out and unemployment is very high. San Basilio is also a symbol of the housing struggle, where people live in unhealthy environments, occupied illegally, and which leads them not to integrate.

The starting point of the regeneration project was the voice of the protagonists of a suburb that seeks to build alternatives to degradation and abandonment.

An interscalar approach (Fig. 2) was adopted to analyze the anthropogenic system, the biophysical system, and the mobility and services system, starting from the Municipality to the district scale, through statistical data

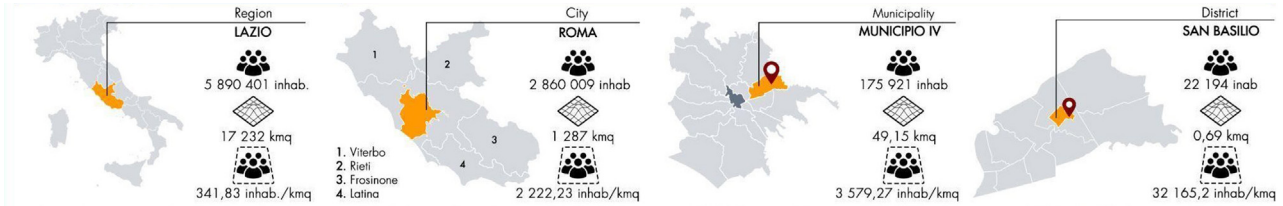


Fig. 2. San Basilio district – territorial context.

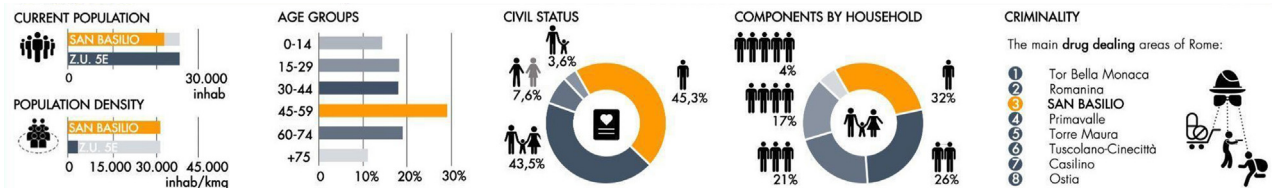


Fig. 3. San Basilio district – social analysis.

extrapolated from entities such as ISTAT and the Municipality of Rome and reworked from documents but also from on-site and virtual surveys, given the elaboration of the research in the middle of the COVID-19 pandemic.

The neighborhood of San Basilio, which since its inception has a predominantly popular connotation, was born in the 1940s as a Fascist borough in the Agro-Roman as a consequence of urban transformations within the city of Rome: many people were relocated from the historic center to the edge of the city in a non-urbanized context, without services and transport. Over time, the neighborhood has undergone various building interventions that have made it an uneven mix of building types and usable spaces.

The social context (Fig. 3) is made up of households of one or more people: students, families and the elderly, predominantly middle-aged. The neighborhood is known for its criminal activities that take place inside: the area ranks third among the major drug squares in the Capital, after Tor Bella Monaca and Romanina. In addition, the historic housing struggles have always animated the neighborhood as evidenced by literature and film productions, such as those of Pier Paolo Pasolini's.

The residents of San Basilio live in a neighborhood with a good road system to which is opposed by an unsuccessful traffic hierarchy. The main road system converges on Casale di San Basilio street, which is characterized by an insufficient road section that results in the constant presence of traffic. The infrastructural network, the road public transport system and the provision of parking spaces are satisfactory from a quantitative point of view, in fact urban standards are met, but not qualitative, due to degradation and a lack of care. 49% of the road network is in poor condition (Fig. 4).

Poor maintenance also involves green, pertinent and public areas, which represent an untapped value between buildings. It is clear that there are few areas of green urban public (11%) both for leisure and sports activities. The green areas available to residents are mainly found in those pertaining to single-family homes (18%) and multi-family homes (56%) (Fig. 5).

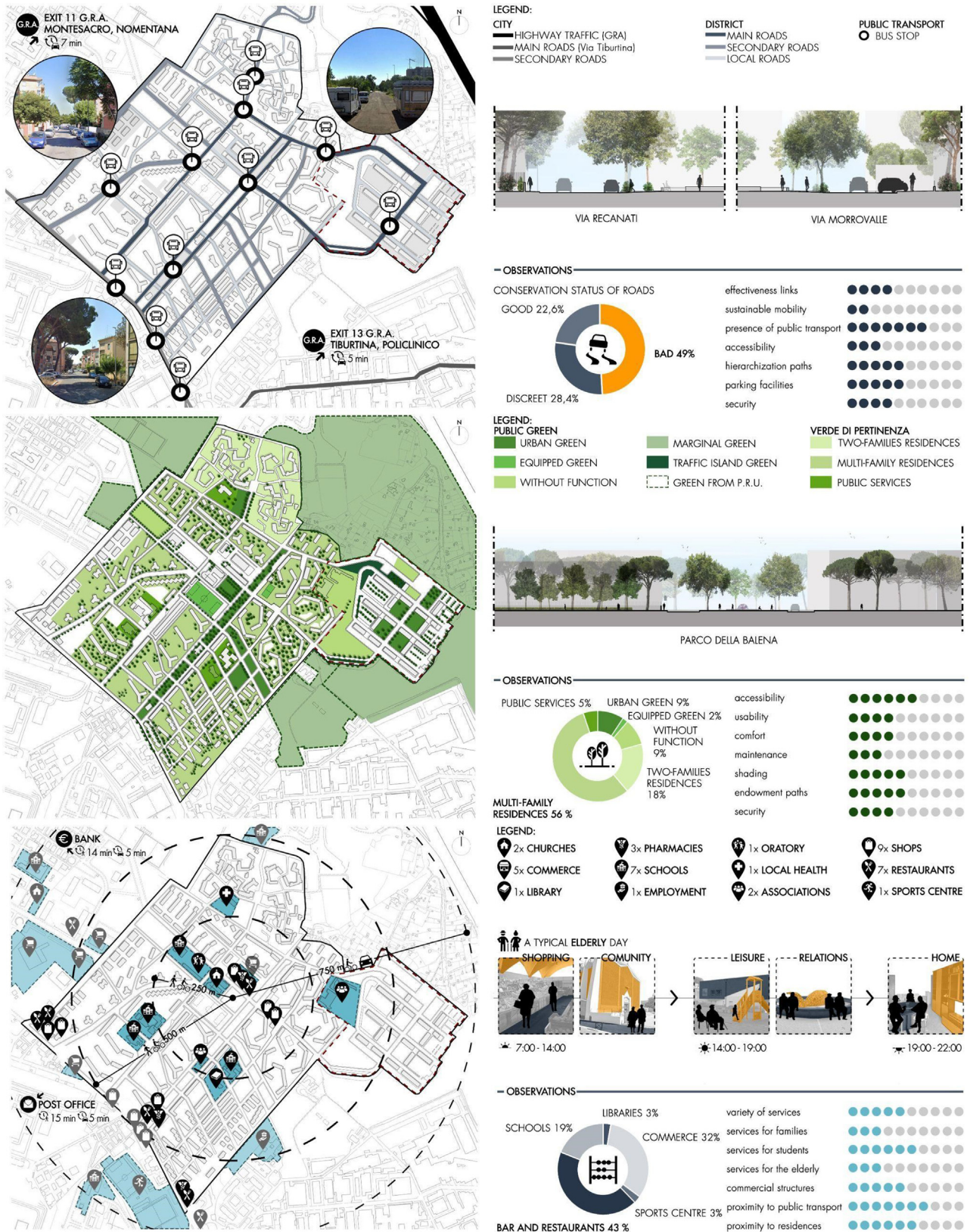
Unlike the school services (19%) scattered within the district, the commercial activities (32%) and catering (43%) are concentrated in three main areas: the Balena Park, Casal di San Basilio street and the commercial area of Casal Tidei. The heart of the neighborhood is the Balena Park, the center of community life. Because of the scarcity and lack of variety of services and activities, residents are forced to move. Moreover, the continuous growth of the elderly population has made insufficient the services dedicated to them (Fig. 6).

San Basilio is marked by a strong sense of community in a context of insecurity, availability of green areas but abandoned to decay, and an area plan that is not integrated with its neighborhood. These elements were the starting point for the construction of a planning vision. Objectives and strategies were defined through the identification of resources and criticalities for each system analyzed: from the redevelopment of the street network and pedestrian spaces, to the promotion of the functional, cultural and social aspects of the neighborhood, from the redevelopment of green spaces to the mitigation or facilitation of wind flows: an action plan to make San Basilio a place to live (Fig. 7).

The design focuses on the area of the *Piano di Zona* (PdZ) not integrated with the neighborhood and, in particular, on three areas of intervention of the *Programma di Recupero Urbano* (PRU) of San Basilio and marked as *Ambiti di trasformazione ordinaria* within the *Piano Regolatore Generale* (PRG) of Rome.

The intensification strategies for the redevelopment of the neighborhood include the construction of two buildings, consisting of social housing and partly intended to house directional, administrative and training spaces of the Spread-out Headquarter, the economic and labor engine of the area; and the construction of a building intended for temporary housing with subsequent transformation into services and activities for the community (Figs. 8 and 9).

The configuration of the new buildings and public spaces was determined by considerations that emerged from bioclimatic, sunlighting and ventilation analyses, a careful study of the best building conformation and exposure for



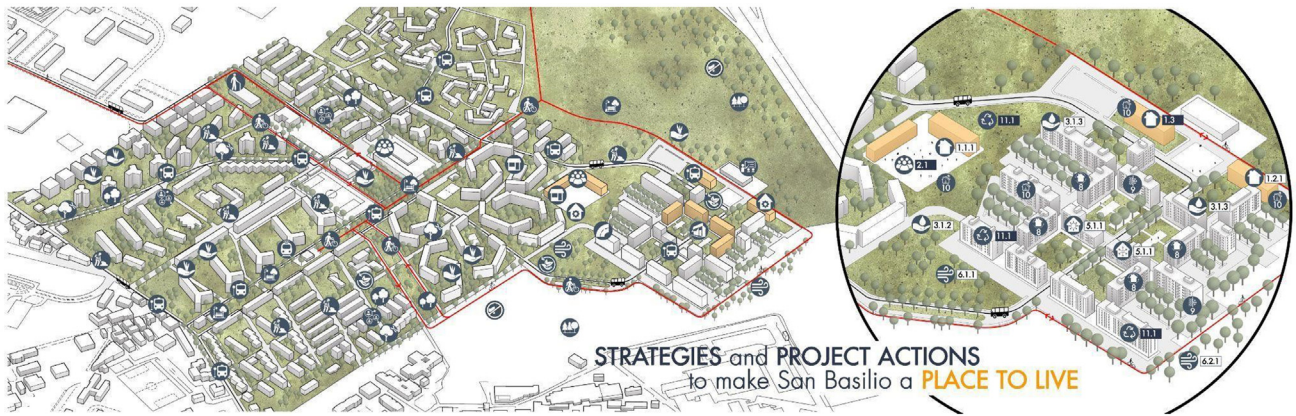


Fig. 7. San Basilio district – meta-project.

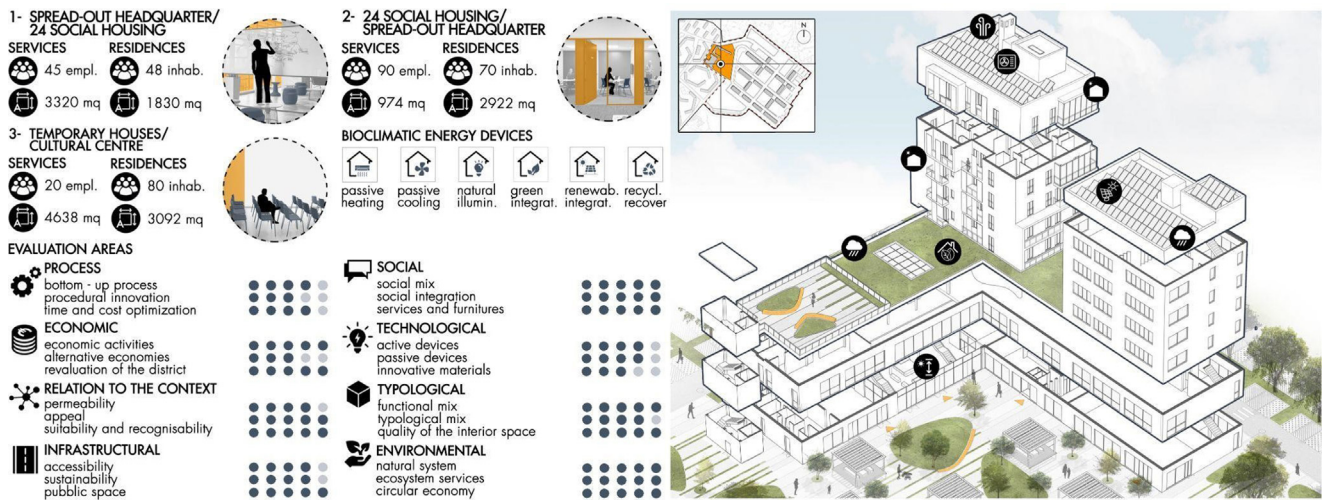


Fig. 8. PdZ San Basilio – dimensions, features, project.

each function and environmental unit. Each service, activity, function and living space was analyzed in terms of: number of users and/or employees, type, radius of influence, time slot and sizing, according to the *Regolamento edilizio e d'igiene* of the Municipality of Rome, taking into account performance requirements through both indoor and outdoor environmental comfort parameters.

The mainly permeable outdoor public space is characterized by spaces and activities for gathering and evergreen and deciduous vegetation species, native and selected on the basis of the species already present. The choice of vegetation species also meets the objective of shielding the buildings from winter winds and promoting summer ventilation. Materials were chosen according to solar reflection, durability, permeability, and cost.

The design of the new buildings took into account environmental sustainability criteria, starting with the choice of X-lam structural technology, which combines the

need for user well-being and the use of environmentally friendly materials with speed of construction and, above all, optimizing costs.

The technological and environmental strategies put in place, through the application of active, passive and ecological systems (Fig. 10), make it possible to achieve high quality standards, returning buildings that are sustainable from an energy and environmental point of view. The buildings are equipped with heat pump heating and cooling systems, and electricity is produced by a photovoltaic system, consisting of 496 panels, to satisfy the energy needs of 74 families and to ensure the environmental comfort and well-being of the occupants and reduce CO₂ emissions. Heating and cooling are also guaranteed through passive systems such as bioclimatic solar greenhouses, with southeast and southwest exposure, and buffer spaces, with northern exposure, characterized by the energy storage system that can contribute to the improvement of living

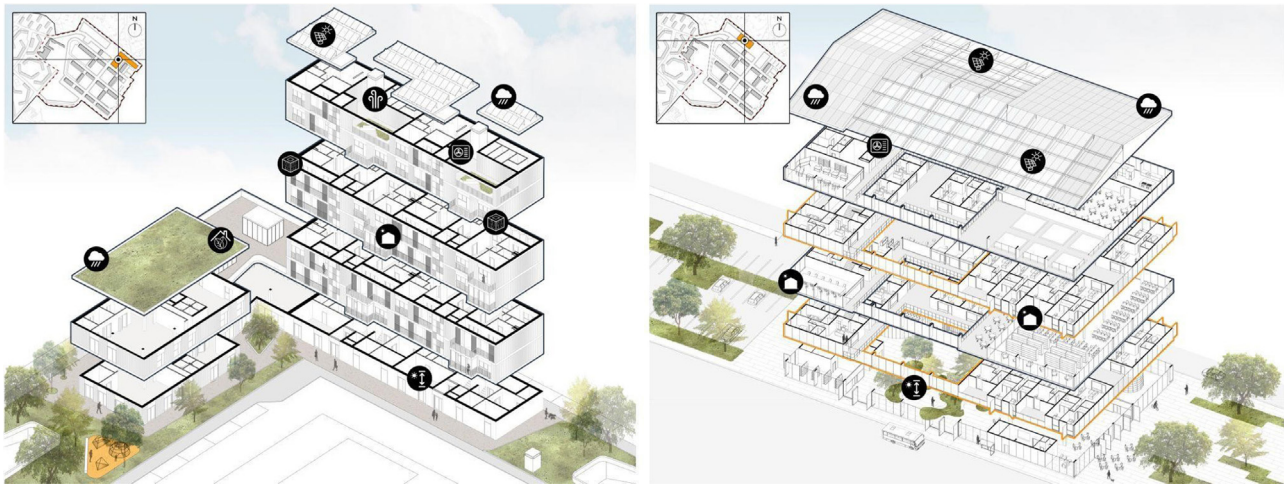


Fig. 9. PdZ San Basilio – projects.

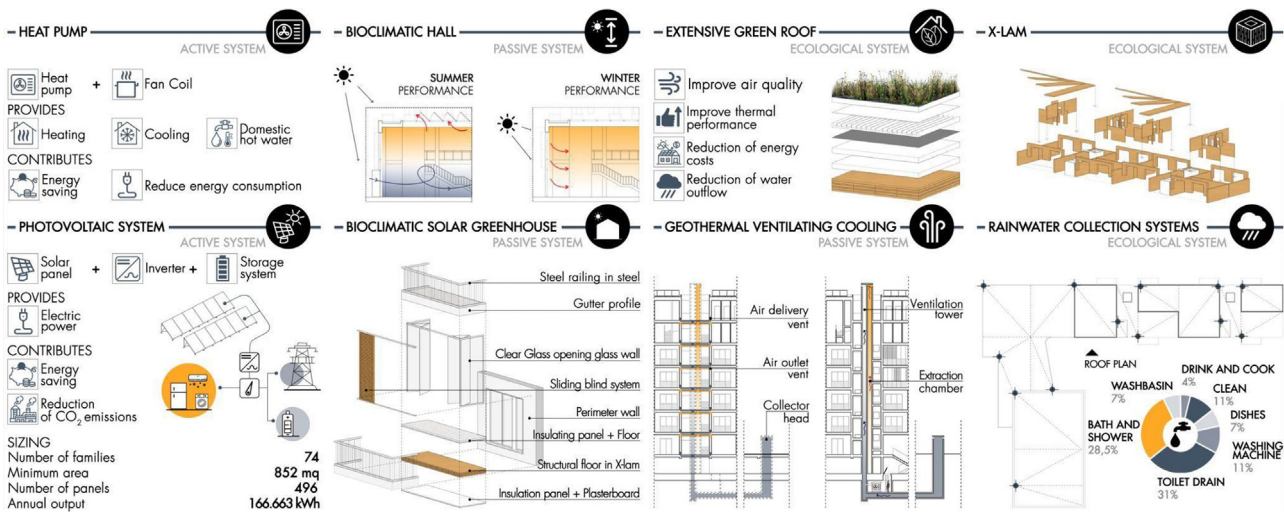


Fig. 10. Active, passive and ecological systems.

comfort and decrease winter heat loss. Ventilation is provided, in the case of housing, by geothermal ventilated cooling, which allows control of the indoor temperature by contributing to the expulsion of stale air, and, in the case of the indoor public space, by bioclimatic hall, which contribute to both heating during the winter period and cooling during the summer period through ventilation. The ecological systems, in conclusion, include a rooftop rainwater recovery system that meets 50 percent of the water needs for irrigation, toilets, outdoor pavement washing, and cars, and the use of intensive green roofs, with herbaceous perennial and crassulaceous species, which allow for indoor temperature regulation and reduce the heat island phenomenon.

5 Conclusions

Today more than ever, there is an urgent need for more territorial co-programming and an integrated public policy

that really puts the suburbs at the center: territories, citizens and the network of associations must work together to help identify innovative responses and interventions to be put in place. In Italy, the *Piano Nazionale di Ripresa e Resilienza* (PNRR) represents, at this time, a great opportunity to accelerate the process of ecological and energetic transition in urban centers, starting precisely from the suburbs, working on areas of intervention such as energy efficiency, sustainable mobility, the redevelopment of urban spaces and green spaces and the fight against energy and educational poverty [15].

The suburbs, therefore, should not be read exclusively as a problem of the contemporary city; they also represent a great resource. The suburbs are vital places, rich in cultural and innovative phenomena, dense and articulated social life, where a presence of social forces expresses an effort to reappropriate the city and its places: a very strong social protagonism that expresses a great action on the territories [9]. Suburbs, because they are distant from city centers, are

places that generate urban gradients because it is within them that the survival strategies of the communities that inhabit them are formed and take shape [8].

The design strategies applied to the San Basilio case study promote the quality of urban life through processes of urban transformation and regeneration for the construction of a new sociality starting from places, reconstructing the link between *urbs* and *civitas*.

In conclusion, activating local economies and social energies, setting goals of environmental sustainability – on an urban and building scale –, growing social capital, improving the quality of life and paying attention to the integration of sectoral policies are therefore necessary aspects of the regeneration project to save, renew and develop the city.

Author contributions

The thesis presented is the result of the work of A. Calvano, A. Canducci and A. Rufini, coordinated by Prof. Arch. A. Battisti, within the Department of Planning, Design, Technology of Architecture - Sapienza University of Rome. The article authors' contributions are attributed as follows: A. Calvano and A. Canducci (Introduction, Context, Methodology, Case Study, Conclusions); A. Rufini (Case Study). The thesis was selected as one of the prize winners within the Med Green Forum-6th edition (20-22 July 2022) - Thesis Award.

References

1. D. Mandolesi, Densità ed energia nei processi di rigenerazione urbana, in *L'industria delle costruzioni* **482**, 2–3 (2021)
2. European Commission, Future brief: no net land take 2050? in *Science for Environment Policy* (2016)
3. L. Barbarossa, D. La Rosa, F. Martinico, R. Privitera, La rigenerazione urbana come strumento per la costruzione della città sostenibile, in *XVII Conferenza Nazionale SIU* (2014)
4. Green City Network, Verso la neutralità climatica delle Green City. Approcci, indirizzi, strategie, azioni. Rapporto 2021 (2021)
5. M. De Matteis, B. Del Brocco, A. Figliola, Rigenerare la città: il Social Housing come opportunità di rinnovo urbano e sociale. IUAV, Venezia (2014)
6. V. D'Ambrosio, M. Leone, Controllo dei rischi del cambiamento climatico e progettazione ambientale per una rigenerazione urbana resiliente. Il caso applicativo di Napoli Est, in *Techne, J. Technol. Architect. Environ.* **10**, 130–140 (2015)
7. A. Battisti, A. Calenzo, L. Calcagni, Rigenerare l'habitat informale in aree marginali attraverso un approccio people-oriented, in *Techne, J. Technol. Architect. Environ.* **24**, 145–156 (2022)
8. D. Modigliani, L'area romana e le sue periferie – Un'analisi del contesto capitolino a partire dall'Unificazione d'Italia, in *AR Magazine*, 120 (2017). Available at <https://www.architettiroma.it/ar-archivio/archivio/166-ar-119-periferia-roma/655-l-area-romana-e-le-sue-periferie-un-analisi-del-contesto-capitolino-a-partire-dall-unificazione-d-italia.html>
9. C. Cellamare, *Abitare le periferie*, Bordeaux edizioni (2020)
10. E. Puccini, I quartieri di case popolari di Roma, in *Osservatorio Casa Roma* (2018). Available at <https://osservatoriocasaroma.com/2018/06/15/i-quartieri-di-case-popolari/>
11. F. Colone, K. Lelo, S. Monni, F. Tomassi, Roma, tre periferie a confronto: Corviale, Ostia Nord e San Basilio, in *Fondazione Charlemagne onlus* (2020), vol. 10
12. M. Russo, Multiscalarità. Dimensioni e spazi della contemporaneità, *Archivio di Studi Urbani e Regionali* **113**, 5–22 (2015)
13. C. Macchia Cassia, *Attraversare le scale*, in *Infra Manuale*, Marsilio (2002)
14. F. Tucci, A. Battisti, Green economy for sustainable and adaptive architectures and cities: objectives, guidelines, measures, *IOP Conf. Ser.: Earth Environ. Sci.* **503**, 1–5 (2020)
15. Ministero dell'Economia e delle Finanze, Piano Nazionale di Ripresa e Resilienza, in *Next Generation EU* (2021)

Cite this article as: Angela Calvano, Andrea Canducci, Andrea Rufini, Urban regeneration of public housing settlements, in Rome: the case study of San Basilio district, *Renew. Energy Environ. Sustain.* **8**, 15 (2023)