

The Role of Urban Planning in Building the Circular Urban Model. The Case of Naples

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Abstract. The paper aims to explore how urban planning can approach city development by focusing on the reuse of urban spaces and the process of rebuilding the city from within. In doing so, urban planning will face specific situations that must be addressed on a case-by-case basis, potentially defining distinct methods for constructing a circular urban development model.

The paper analyzes a specific area of the city of Naples characterized by the presence of zones that are part of the historic urban center and more recent areas belonging to both consolidated and unconsolidated expansions. The area is examined in relation to transformation areas where significant changes in land use and urban form are either underway or planned.

Keywords: Naples · Urban requalification · Circular urban model

1 Introduction and Methodology of Research

The aim of the paper is to explore how the concept of the circular economy can be applied to urban regeneration and redevelopment, using the city of Naples as a case study. It investigates how principles of circularity – though not always explicitly named – have historically influenced urban planning in Italy, and how they can now be consciously integrated into modern urban strategies to create more sustainable, resilient, and inclusive cities. This paper aims to explore how urban planning can approach city development by focusing on the reuse of urban spaces and the process of rebuilding the city from within. In doing so, urban planning will face specific situations that must be addressed on a case-by-case basis, potentially defining distinct methods for constructing a circular urban development model.

Urban planning, from the early 1900s until the 1970s–80s, was primarily characterized by actions aimed at urban expansion. This process affected all the most advanced nations, characterizing a period of strong economic and social burst and leading to a significant rise in the wealth and well-being of European and Western countries.

The urban expansion process has come to an end over the past few decades for several reasons. On one hand, in many parts of Italy and Europe, it has saturated the available territorial spaces. On the other hand, population growth has slowed in many areas, affecting the expansion processes of cities. Furthermore, the evolution of economic

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systems and innovations in sectors such as mobility have resulted in the multiplication of cases of abandonment and degradation of many urbanized areas within city structures.

This process also affects the historical parts of the city, where very different phenomena, often in stark opposition, are concentrated. On one hand, there is the use of central urban areas as spaces of prestige, wealth, and exclusivity; on the other, there is the deterioration caused by abandonment and the lack of use and maintenance of urban spaces.

The paper analyzes a specific area of the city of Naples characterized by the presence of zones that are part of the historic urban center and more recent areas belonging to both consolidated and unconsolidated expansions. The area is examined in relation to transformation areas where significant changes in land use and urban form are either underway or planned. The analysis of the case study aims to determine whether these transformation processes take into account principles related to sustainability and the circular economy and whether they are compatible with the existing urban structure, which – particularly in the historic area – developed in periods and for functions very different from those currently present.

The paper represents the first step in a broader analysis. Further steps are planned, focusing on a deeper examination of the study's main critical aspects. The research starts with the urban evolution of the city and ultimately proposes a system of potential interventions. These interventions will apply the concepts of sustainability and urban circularity as guiding principles to support urban policies and planning.

To carry out this research project, the methodology follows the structure below:

1. Theoretical framework and literature review to establish the conceptual foundation for the circular economy and its relevance to urban planning. This step conducts a systematic literature review of academic sources on circular economy, urban regeneration, and urban planning history, also analyzing relevant policy documents and planning regulations.
2. Historical-comparative analysis to understand how circular economy principles have implicitly influenced past urban planning practices. This involves examining historical urban plans and redevelopment initiatives, comparing planning goals, land use changes, and redevelopment approaches across different time periods, and identifying implicit circular economy principles such as reuse, preservation, and densification.
3. Case study method to conduct an in-depth analysis of a specific area undergoing urban transformation.
4. Policy and planning document analysis, to assess how current urban transformation efforts incorporate circular economy principles.

2 Literature

The circular economy is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible. In this way, the life cycle of products is extended [1].

The literature on circular economy is extensive. The main idea of circular economy is to retain the value of resources and to prevent the use of virgin materials and waste outputs, not only by recycling and reusing, but primarily by reducing the need for

resources [2]. Corvellec et al. [3] present a reasoned account of the critiques addressed to the circular economy and circular business models. Kirchherr et al. [4] confirm this and present 114 circular economy definitions which were coded on 17 dimensions. From these definitions derive that the main aim of the circular economy is considered to be economic prosperity, followed by environmental quality; its impact on social equity and future generations is barely mentioned.

Geissdoerfer et al. [5] deepens the connections between circular economy and sustainability highlighting that similarities and differences between both concepts remain ambiguous. Also Korhonen et al. [6] deepen the limitations of the concept of circular economy and conduct a critical analysis of the concept from the perspective of environmental sustainability.

An answer to the doubts come from Morseletto [7] that examines which targets can facilitate the transition towards a circular economy starting from 10 common circular economy strategies (i.e. recover, recycling, repurpose, remanufacture, refurbish, repair, re-use, reduce, rethink, refuse).

Specific attention is on the relationships between circular economy and the city. Petit-Boix and Leipold [8] sustain that cities are implementing a number of initiatives that aim to turn them into sustainable circular systems, also if whether these initiatives achieve their sustainability goals is largely unknown. For the authors cities encourage strategies relating to urban infrastructure, with an additional focus on social consumption aspects, such as repair and reuse actions. Research has yet to assess urban planning strategies, essential for defining the impacts of other urban elements.

Bolger and Doyon [9] sustain that the continuous growth of the cities is supported by systems of production and consumption that contribute to the depletion of natural resources and pollution of the environment. The circular economy model offers an alternative to the predominant take-make-dispose economic system. In particular, the role of strategic planning can facilitate a circular economy in urban settings. Using a comparative case study of the municipalities of Melbourne, Australia and Malmö, Sweden, the authors sustain that strategic urban planning can translate circular economy objectives into actions within specific urban areas, although barriers still exist to fully integrating the circular economy model.

Lakatos et al. [10] sustain that cities play a focal role in facilitating the transition towards circularity through the closing of the loops, recirculation, technical innovation, policy elaboration and citizens' support. Circular economy applied at the urban level still needs effort and innovation to successfully pass the transition phase from the linear economy. The authors develop a framework model that can be adapted in other cities to facilitate their transition to circular cities. Other authors [2] highlight that climate efficiency in cities cannot be improved simply by replacing the old structures with new ones, because both the construction and operation phases cause major resource and energy consumption. The review of literature is the basis for deepening three approaches for the adoption of circular economy in the built environment: (1) Management for sustainable cities; (2) Urban services and consumer practices aligned with circular economy; and (3) Cleaner production and construction. In the management of sustainable cities, the literature highlights self-correcting 'adaptive management cycle' with the phases of planning, implementation and evaluation.

As seen, an extension of the concept of circular economy is its application to the city [11]. Applying it to the city seems natural when considering that the circular economy is a theoretical framework aimed at deepening the understanding of production and consumption processes in relation to their increasing sustainability. In the traditional economy, production and consumption are closely linked to the concept of waste. Implementing circular economy processes grants a high level of sustainability, as its production and use do not naturally end in landfill disposal but rather in its transformation into a new product.

This process can be applied to urban structures in relation to the expansion of actions for regenerating degraded urban areas, repurposing abandoned spaces, improving energy efficiency, and implementing more sustainable waste management systems.

A settlement, and particularly a historic center, inherently applies the concept of a circular economy. While it may be debated whether this occurs at the micro level of buildings, it is undeniable that it happens at a macro level (districts, neighborhoods, and urban centers).

Urban centers are structures situated in a specific location where adaptation processes have been continuous over time since their foundation. They constitute an active artificial space, undergoing constant transformation – whether rapid or gradual, visible or subtle.

A city, therefore, can be considered a typical example of a circular economy, where space undergoes an initial transformation at a given time and a series of subsequent changes. These may include additions and modifications to volumes and functions within the space, yet the overall structure remains functional.

Why is it important to explore these aspects? Because the fundamental issue of urban structures, in their oldest or newest parts, is now the compatibility – both in terms of the functions they can accommodate and the use of spaces and volumes.

After the most critical period (from the second half of the nineteenth century to the first half of the last century), during which the central parts of cities were seen as urban structures to be modernized, often through radical interventions, we now face protection regulations that become stricter as the historical value of an area increases, preventing drastic transformations. However, the issue of adapting these spaces to functional evolution and the impacts that this evolution brings remains unresolved.

3 Theoretical Background

3.1 Transformations in Urban Structures: The Urban Planning Perspective

The restoration of historic centers was a topic of great cultural significance in the 1960s and 1970s, a period in which the protection of urban structures inherited from previous eras became more prominent, also due to the continuous destructive interventions on historic centers occurring at the time.

The radical transformation of morphology and functional stratification within urban centers was considered a “normal” operation for a long time, acquiring negative connotations only after World War II, when a cultural movement more focused on preserving even the smallest historical testimonies gained prominence over perspectives that favored unrestricted intervention.

Modern urban planning has complemented straightforward restoration efforts with new tools that have enhanced intervention capabilities based on the assumption that the focus is not solely on restoring physical structures but rather on the overall revitalization of the system formed by physical structures, relational frameworks, and socio-economic elements that interact with one another and enable coordinated intervention on the built environment.

This means that proposed tools no longer have merely a local relevance but are strongly connected to the urban scale, as they can influence the roles different urban sectors assume within city centers and add layers of meaning to interventions on built environments. Additionally, the cultural contributions that urban planning has assimilated in recent years have increased the significance and value of tools that were already influential in the economic and social framework of our post-industrial society.

The city can be analyzed from many perspectives: as a concrete expression of collective life, as a product of economic forces acting within the territory, as a political and social incubator, as a material trace of the past, and as the foundation of the future. Different evolutionary periods (both past and present) coexist within the city, adapting with varying degrees of ease. The awareness that the historical heritage present in cities enriches the entire social structure is a relatively recent achievement.

The urban planning debate on the preservation and restoration of older structures has been ongoing for a long time, beginning in the post-war reconstruction phase, when awareness of the need to preserve historic centers developed.

To the question of why restoration is necessary, one can respond with the theoretical assumption that the city is a system in which all elements are interrelated, to the extent that interventions on one part affect the entire organism, and the transformations achieved through restoration and enhancement of pre-existing elements represent a significant cultural enrichment for the urban community.

The evolution of theories and practices of urban intervention over the last century has facilitated a gradual shift from purely substitutional interventions to conservative interventions, and ultimately to interventions focused on the revitalization of structural elements and connective tissue [12].

After World War II, Italy was engaged in a difficult reconstruction effort. One consequence of this process was, on the one hand, the concentration of speculative activities in city center areas and, on the other, the neglect of other areas that were also affected by war destruction but were less economically attractive.

The total lack of control over reconstruction efforts provoked a strong reaction in defense of historic city centers. The “conservationist” stance was the most successful among various cultural groups (Nuova Italia, Associazione Nazionale Centri Storici, etc.) that emerged in the 1950s to protect the historical and artistic heritage.

The conservationist position excluded the possibility that historic centers could undergo modifications and adaptations, adhering to a cultural approach that prohibited any transformation within historic districts. This perspective effectively enforced stagnation in ancient areas while demonstrating marked indifference toward the rest of the urbanized territory.

According to conservationist views, only the ancient city deserved protection, and consequently, all urban planning interventions following nineteenth-century methodologies were condemned as destructive to centuries-old urban fabrics and detrimental to traditional living standards and social relationships shaped by local conditions. The expansion of tertiary functions within historic centers was considered highly harmful, as was the encroachment of modern urban developments that, by increasing surrounding populations, would render preservation impossible and, in a sense, pollute the historical character of the center.

By completely freezing any possible transformation of the historic center, it was effectively turned into a monument in its entirety, preserved as a testimony to past civilizations. This extreme position reflected a historical-cultural approach incapable of grasping the dynamic nature of urban evolution and development, prioritizing aesthetic and visual values over functional and economic ones, which ultimately weakened and rendered conservation efforts impractical.

Even at the time, the limitations of such a one-sided view of conservation were evident to those who saw the city as an evolving organism, in which the physical manifestations of each historical period serve as indicators of the civilization's progress. From this perspective, the preservation of the built fabric and architectural heritage needed to be framed within a broader discourse that addressed factors such as urban decay (understood as both a loss of functionality and the imposition of sterile insertions into unprepared contexts) [13], the interactive relationship between conservation and urban development, the necessity of defining urban transformation directions, the social relationship between center and periphery, and the challenges posed by urban services and exchange flows.

With Law 457 of August 5, 1978, particularly under Title IV, building and urban restoration were regulated for the first time by national legislation. The law delegated municipalities to identify areas subject to restoration. Within these areas, five types of interventions were defined under Article 31 [14].

The most advanced element of the law is its consideration of urban decay as a condition that affects not only historic city centers but the city as a whole. This broadened understanding of decay opened the door to interventions beyond historic centers, potentially fostering new relationships between different urban areas by addressing their interactions and altering urban development factors.

The scope of restoration activities was further expanded when applied not only to ancient urban fabric but also to more recent structures, thereby incorporating all built environments into conservation efforts, regardless of their intended use. This approach prioritizes the reuse of developed land over the consumption of new territory.

Law 493/1993, issued to accelerate investments and support employment, assigned urban renewal the role of facilitating a broad range of interventions aimed not only at restructuring limited urban areas (through projects encompassing building restoration, infrastructure integration, and environmental improvement) but also at the urban requalification of larger urban zones, addressing mobility (mass rapid transit, enhancement of local public transport) and parking.

The primary objective of this tool is the requalification of public residential assets built in the post-war period, which are generally in significant decay, along with the

related urban services (both punctual and network-based), individual demand facilities, and urban furnishings.

In addition to the Urban Recovery Plan, the Urban Requalification Program (Ministerial Decree of December 21, 1994) was introduced, aimed primarily at addressing socio-economic, building, urban, and environmental degradation frequently found in peripheral or semi-central areas of large cities.

The Urban Requalification Program is similar in purpose to the Integrated Intervention Program introduced by Article 16 of Law 179/1992. It allows for territorial interventions that include planning efforts aligned with general regulatory plans, identifying implementing parties (both public and private), securing necessary financial resources, and establishing execution timelines.

The transition from the concept of recovery to that of redevelopment has recently undergone a further evolution, with the growing use of the concept of urban regeneration. On this issue, the national parliament is also working to define specific legislation [15], while the term has already been incorporated into various regional regulations. According to the unified bill project, "urban regeneration" refers to "a systematic set of urban and building transformations in urban areas and building complexes characterized by urban, building, environmental, or socio-economic degradation, which do not lead to land consumption, and follow criteria that employ methodologies and techniques related to environmental sustainability. This also includes actions for the reversible renaturalization of consumed land, the recovery of lost ecosystem services through de-impermeabilization, remediation, enhancement of ecological-environmental potential, and urban biodiversity".

3.2 The Circular Model and the Urban Trasformations

In the circular economic model, maintaining the value of products, materials, and resources is crucial. This must be achieved for as long as possible while minimizing waste production. The model is structured to extend the useful life of goods and eliminate or reduce waste.

In an urban context, the product's value translates into the city's image, the value of materials corresponds to the quality of the physical system (buildings, infrastructure, etc.), and resource value reflects the functionality of the city's systems.

These factors define the uniqueness of the urban system. They are not static but evolve, grow, and improve over time. At the same time, this uniqueness is also built on the level of space reuse and minimal waste generation.

It can be stated that regeneration processes are processes to which an innovative intervention model, such as the one linked to the urban circular economy, can be applied.

The introduction of the circular economy model applied to cities focuses on regeneration rather than consumption, the reuse of existing spaces, and resource optimization. Specifically, key concepts in the reuse of abandoned or not abandoned spaces include:

- Regeneration of buildings and spaces to adapt them to new functions.
- Utilization of disused areas for sustainable infrastructures such as new public transport systems, spaces for sustainable mobility, or urban green areas.

– Reducing resource consumption, both in terms of resources for constructing new buildings and resources for using them (land, energy, materials).

A strategic approach to circular urban planning is required for this transition. Several conditions are considered necessary for this approach to succeed:

– Context-specific planning that emphasizes the importance of developing urban plans tailored to each city or urban area, based on local characteristics. There is no one-size-fits-all solution. Regeneration and reuse needs vary depending on the context.
– Involvement of local communities, highlighting their role in the planning process. Citizen engagement is essential to ensure that interventions meet the population's real needs, creating spaces that promote social cohesion.
– Innovative technologies for sustainable planning, exploring both analytical methods (urban digital twins, real-time monitoring, etc.) and intervention strategies (smart cities, apps, etc.) that can optimize the management and planning of urban resources, making the city more efficient and less polluting.
– Attention to the conditions of the city green services, with the promotion of policies addressed to the growing of the green areas and to the promotion of the ecosystem services.

4 Case-Study

4.1 Naples and Its Central-Eastern Area

Naples is a highly interesting case for understanding the significance of a historic center in the evolutionary processes of a large urban area. The historical center has a clear impact on the city, especially when considering its ongoing economic relevance in the tertiary sector and, more recently, in tourism. For this specific work, the paper analyzes a specific portion of the city located in the central-eastern area (Fig. 1).

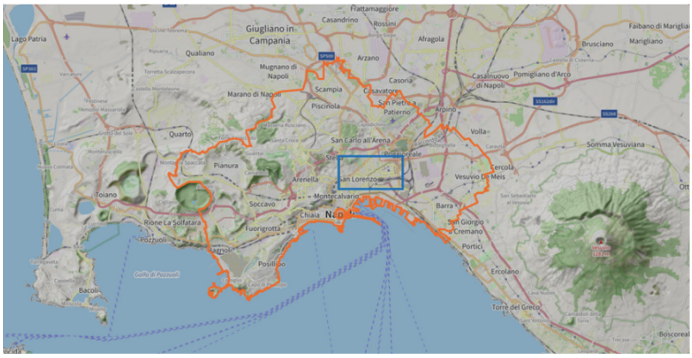

Fig. 1. Naples Municipality (orange) and surrounding territories. The case study area is indicated with a blue rectangle. Source: Author on Openstreetmap, 5/12/2024.

The wealth of architectural heritage makes it a unique case at both national and international levels. The interventions that have altered the face of this part of the city tell a singular story. Beginning with the cholera epidemic of 1884, the interventions reshaped the urban and social fabric without radically transforming it (Fig. 2).

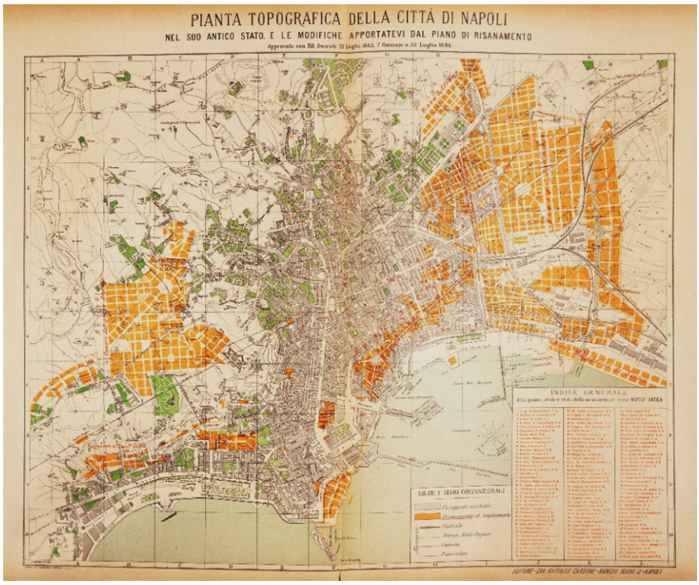

Fig. 2. The Risanamento in Naples. Intervention in the historic center and new urban expansions. Source: [16].

Other localized interventions affected its configuration after World War II, despite several attempts to alter its structure significantly. In recent decades, the introduction of rapid transit networks has changed the way people access and experience these urban spaces.

Today, Naples' historic center appears to have achieved a balance, thanks in part to urban planning tools that regulate its protection and transformation. This is not entirely true. On one hand, the set of rules governing its transformation is constantly tested by interventions of various scales, while on the other hand, significant phenomena – especially tourism – act as a slow but continuous process that tends to further weaken the resident social fabric.

The historic center of Naples is a complex system where an extensive network of monumental sites integrates seamlessly with the non-monumental urban fabric. The coexistence of these two building types has lasted for centuries in a symbiotic relationship. Buildings, churches, convents, and other structures are part of the residents' everyday experience. While they are not immune to occasional neglect, they remain recognized elements of the urban landscape.

The fabric of today's historic center began forming during the urban transformations of the medieval period. From that time on, the city underwent continuous changes that

transformed the historic core without overwhelming it, at least until the early nineteenth century. At that point, the mechanisms of urban development changed, and the city began to expand based on much more radical real estate and industrial interests than in earlier periods [17, 18].

Until the early nineteenth century, the city's growth was characterized by a high degree of uniformity. From the nineteenth century onward, urban development accelerated and often profoundly affected both the built city and its surrounding areas. Interventions in the 19th and 20th centuries were carried out according to well-defined urban designs with new planning, typological, and distribution rules. Although different from earlier practices, these interventions succeeded in shaping new, strong elements that contributed to the city's image, following a model applied in many other European cities of the same period (Fig. 3).

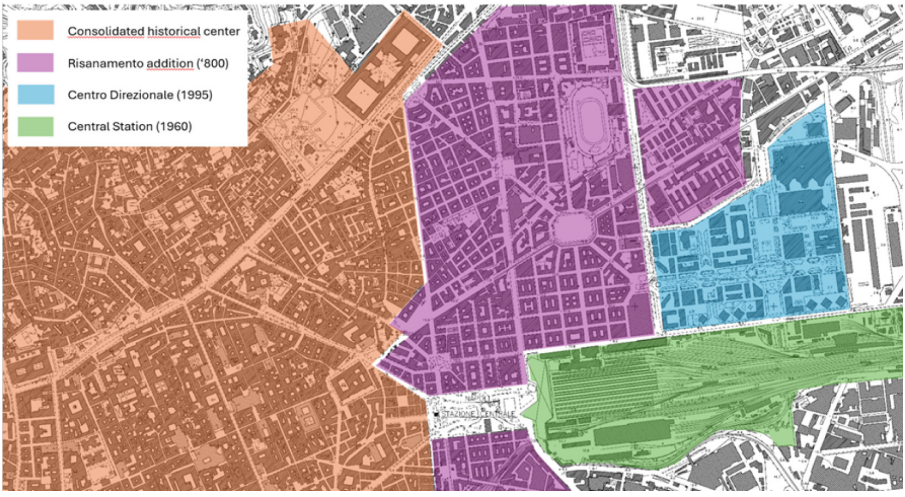

Fig. 3. Naples study area. From the historic center on the west to the Risanamento addiction and over. Source: Author.

The process that led to what is considered the city's historical development was formally recognized by the 2001 General Urban Plan (PRG) of Naples. This plan extended the boundaries of the historic center to include areas developed during the 19th and early 20th centuries, encompassing all urban fabrics preceding the post-World War II period. These areas are considered consolidated, representing a mature relationship between buildings and their surroundings, and are therefore subject to specific conservation regulations.

In the context of the historic center, the PRG of Naples adopts "typological classification" [19, 244] not only as a repository of knowledge to guide interventions but also as a "reading method" for urban fabrics. Its detailed approach allows for a direct transition from the General Master Plan to interventions on individual structures, without requiring additional operational planning tools.

The central-eastern area includes both parts of the ancient city and sections of the more recent city, which are still considered part of the historic center due to their pre-World War II origins.

4.2 Uses and Functions in the Study Area

In the field of research, significant interest is focused on the central-eastern area of the city. The analysed area is defined by key boundaries: to the North, the Albergo dei Poveri; to the South, the Central Station; to the East, the Centro Direzionale; and to the West, the city's historic center. It is a vast area characterized by the historic center to the west, the eastern part of the city to the east, and a central transitional area distinguished by its typical nineteenth-century urban expansions, which are regular and focused on maximizing real estate value.

While the historic center is a gem protected by UNESCO for its features and uniqueness, the eastern zone is the result of an entirely opposite urban development - lacking urban quality and any recognizable design. The central part, which separates these two areas, embodies both the merits and flaws of the western and eastern zones and does not seem to have its own distinct identity, other than being a generic urban expansion.

This area serves as a paradigmatic example of urban transformation processes within the city of Naples. The territory is partly stratified over time – primarily in the historic center – and partly unstratified, as it is of more recent formation. The latter includes largely regular urban grids shaped by the late nineteenth-century Risanamento [20–22], alongside spaces with functions that remain undefined. This means that ongoing transformations in this part of Naples could be highly significant and have a major impact on the city's overall image. The Centro Direzionale and the Central Station area are key components of this district (Figs. 4 and 5).



Fig. 4. Neaples study area. Main historical and modern poles. Source of the basic cartography [23].

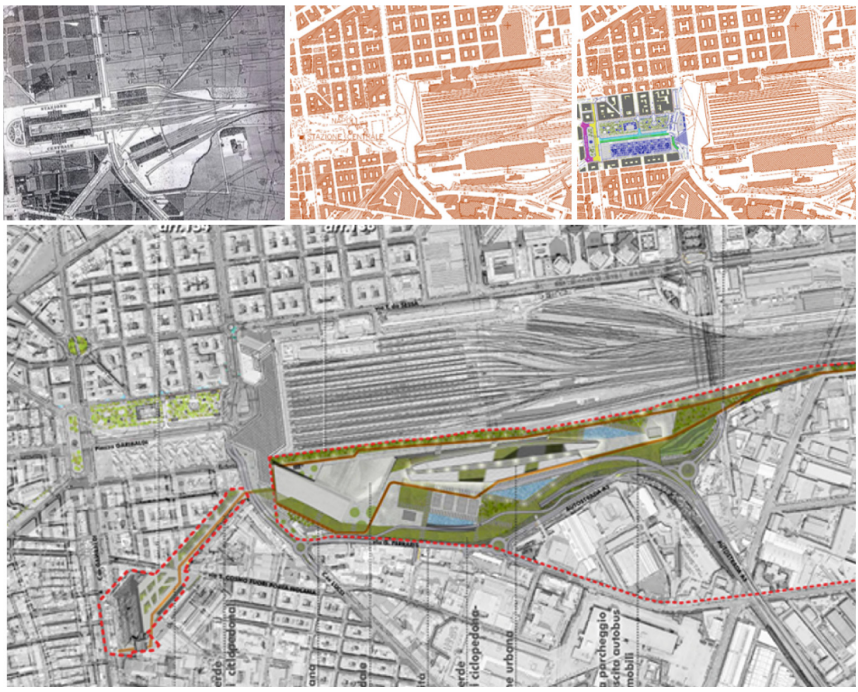

Fig. 5. Central Station area. Transformations from the second half of the Nineteenth century to today and over, with the Napoli Porta Est project.

The described area is characterized by prominent historical and architectural elements, strong consolidated urban stratifications, as well as more recently developed sections of varying quality, still undergoing consolidation.

As a result, urban transformations here can be highly impactful, steering towards objectives that not only enhance the quality of the existing urban fabric but also improve the city's resilience to climate change. This perspective aligns with the vision of a self-regenerating city, aimed at strengthening its adaptability and overall capacity for resistance.

The redevelopment of Piazza Garibaldi, completed in 2015, was designed by architect Dominique Perrault as part of the opening of the Garibaldi station of the Naples Metro Line 1. The intervention begins with the construction of the new underground station and extends to the surface, where the square was redesigned to include a 360 x 165-meter open space, covered by a system of steel tree-like structures. The project started from the renewal of critical infrastructure and expanded to the urban realm in an area that experiences a traffic flow of approximately 50 million people per year. The surrounding urban fabric is also undergoing significant regeneration programs.

In 2023, a Program Agreement was signed between the Campania Region, the Municipality of Naples, FS Sistemi Urbani, RFI, and EAV for the "Development of the Naples Garibaldi-Porta Est Complex Intermodal Node and Urban Regeneration of Adjacent Railway Areas". Pursuant to this agreement, the Campania Region and FS Sistemi Urbani

launched an international design competition for the creation of the overall masterplan of the intervention, named “Napoli Porta Est” (Fig. 6).



Fig. 6. Neaples study area. Mobility poles (metro and railways) and redevelopment areas.

The urban implementation plan derived from the project must be submitted for review and approval by the Municipality of Naples. The design competition, awarded to Zaha Hadid Architects in February 2025, covers an area exceeding 200,000 square meters. It focuses on the urban regeneration of the former FS freight yard at Centrale/Garibaldi station, with the integration of new mixed-use public-private functions and the new headquarters of the Campania Region; the reconnection of the redevelopment area with the surrounding urban fabric; the development of a pedestrian and cycling network equipped with green spaces and urban facilities; a new configuration of road infrastructure to improve urban and extra-urban traffic flows related to the new Garibaldi-Porta Est intermodal hub; the design of high-energy-efficiency solutions and enhancement of ecological and environmental quality.

A third strategic intervention concerns the redevelopment of the Centro Direzionale, designed by Japanese architect Kenzō Tange and completed in 1995. The area currently suffers from inadequate maintenance and outdated infrastructure, particularly the underground parking facilities beneath the central platform. Over the years, the area has also experienced a decline in activity within the towers, despite the introduction of new services and businesses. The planned opening of the Line 1 metro station in early 2025 is expected to act as a catalyst for the area’s overall regeneration, improving connectivity with the rest of the city and initiating a comprehensive upgrading process for the entire complex.

A fourth major intervention involves the former wholesale fruit and vegetable market area, located east of the Centro Direzionale between Poggioreale and Gianturco. This

area is currently subject to a project financing procedure for the development of Are-Napoli, a large multifunctional venue with a capacity of over 15,000 seats for concerts and 13,000 for sporting events.

The projected opening is scheduled for 2026, the year in which Naples will serve as the Sport European Capital. This new facility aims to fill a critical gap in the city's existing infrastructure for large-scale events. AreNapoli is part of a broader urban regeneration strategy for the eastern areas, including Naples' former industrial zone and the adjacent Piazza Garibaldi area. Its strategic location near the future metro station will ensure high accessibility and is expected to contribute significantly to the revitalization of the eastern sector of the city.

The socio-economic and environmental data of the city of Naples are generally negative. The city is usually ranked in the lower positions of national rankings, although it must be said that these rankings are typically based on provincial or metropolitan area data. This situation represents a vulnerability for the city, as the broader metropolitan area reduces the overall quality of the territory [24, 25]. In the 2024 Quality of Life ranking by Il Sole 24 Ore [26], the city is positioned 106th, or second-to-last. Its position varies across different categories: it ranks last for wealth and consumption, 65th for demographics and society, 101st for environment and services, and 68th for culture and leisure.

These data, along with others recently published (for example, Legambiente places Naples 103rd in the Ecosistema Urbano ranking [27], show the persistence of a state of crisis in the city despite the efforts made and ongoing to improve its overall quality.

5 Elements of Discussion

The considerations introduced in the previous sections have demonstrated the existence of a close relationship between processes of urban regeneration and redevelopment and theories connected to the principles of the circular economy. As shown in other studies [28–30], the analyses conducted have highlighted the possible interrelations between these two sectors, because both increasingly aim toward an organization of planning and operational actions that is strongly influenced by principles of sustainability and resource consumption reduction.

A relevant point of interest lies in the fact that the process of transition towards the use of an urban circular model has specific social and economic impacts. Circular urban regeneration processes create new economic opportunities (new forms of entrepreneurship and jobs in sectors such as building retrofitting, sustainable architecture, and green mobility services), improve social inclusion, and enhance quality of life through positive social impacts and the creation of new public, accessible, and green spaces.

However, critical elements persist and cannot be ignored. Gentrification phenomena often accompany regeneration processes, resulting in social simplification and the marginalization of low-income and low-education groups. Regeneration means investment and transformation of areas, which leads to rising housing, service, and goods costs, ultimately forcing low-income residents out. These aspects are by no means secondary and must be carefully considered when planning and transforming the city into a highly sustainable system. Many of the criticisms directed at these processes, especially from

groups and political forces less sensitive to sustainability issues, focus on the increase in costs that these processes entail and the fact that these cost increases are economically unsustainable for large segments of the population.

There is also the difficulty of changing habits and lifestyles, which affects the speed at which more innovative and sustainable approaches can take root within social systems. One of the main criticisms of European policies on environmental sustainability is that they are based primarily on technocratic processes with predefined deadlines established in a top-down manner, with little consideration for external constraints. These constraints, mainly of an economic and social acceptability nature, can reduce or even block the full implementation of this process.

This has an additional political consequence: the growing rejection of such environmental policies by increasingly large segments of the population, who perceive them as elitist rather than the result of a careful analysis of the population's primary needs. Although these paths are taken based on evidence that currently makes them seem like an unavoidable choice, this perception is not shared by broad sections of the population.

Thus, it can be said that the process can succeed – though certainly not with a 100% probability – if there are two conditions:

- It must originate from the bottom up and be continuously supported over time by those who will be the primary agents of change, namely the citizens.
- It must be financed with public resources, with the goal of maximizing the benefits for the entire population, given that, as mentioned earlier, these processes significantly impact the economy of individuals and families.

Without these conditions, the process seems unlikely to succeed, especially in a situation where the economy is moving toward goals in which sustainability is becoming an increasingly marginal factor.

Despite this, the ongoing process still appears to be moving toward the development of good practices that can be applied, adapted, and reused in other contexts. The process has a clear, practical, and experimental value in the urban sphere and is heading in what seems to be an unavoidable direction—one that must be pursued regardless of the pressures stemming from climate change and meteorological crises.

It is a process that rightfully becomes part of the broader urban evolution processes that, over the centuries, have introduced elements of innovation in how cities are built and how their services and activities function.

In this context, several Italian and international case studies are particularly noteworthy for having started to apply circular economy models to urban planning and management tools. Among them, the following examples can be highlighted: Copenhagen, with its carbon neutrality strategy and extensive use of regenerated green spaces, Amsterdam, a pioneer in adopting a circular economy model in urban management, including the redevelopment of port areas, and Milan, with the focus on the redevelopment of former industrial areas and the creation of new public spaces, such as the Porta Nuova and CityLife projects.

6 Conclusions

The aim of this paper was to explore the possible applications of the circular economy concept to urban regeneration and redevelopment initiatives. To this end, the paper analyzed general principles, which were then applied to a case study of an area in the city of Naples.

The study highlighted how the concept of circularity, even if not explicitly stated, was already present within planning instruments, particularly in the implementation tools developed following the enactment of Law 1150 of 1942, the main national urban planning law. This becomes particularly evident in subsequent phases, when the preservation of historical urban structures became a central theme in urban planning debates, leading to the enactment of regulations on urban renewal in 1978. Over time, additional regulations followed, expanding the scope of urban recovery and redevelopment measures. These evolved into a system of urban planning tools aimed at guiding cities towards more equitable, modern, and functional conditions.

The evolution towards urban regeneration and redevelopment tools highlights a dual perspective on the relationship between urban interventions and the application of the circular economy concept.

On one hand, circularity can be considered a fundamental principle underlying recovery, redevelopment, and urban regeneration efforts, even though it was not explicitly recognized as such at the time. This implies that early recovery actions can be seen as precursors to the concept of circularity, despite their unawareness of this pioneering role.

On the other hand, the circular economy concept can be fully applied only to the more recent evolutions of urban regeneration, where interventions focus on existing spaces while incorporating sustainability and urban resilience considerations. This is achieved through innovative methodologies and technologies that minimize resource waste and create more sustainable urban spaces capable of addressing climate change challenges and urban polarization.

The case study analysis supports these considerations. The historical part of Naples underwent radical transformations during the 19th and early 20th centuries, with little regard for preservation. It was only from the 1980s onwards, with the adoption of the new city master plan, that interventions in the historic center shifted towards conservation and enhancement of existing structures.

Conversely, transformations in non-historical areas were far more radical, often with little consideration for their spatial context. This may explain why Naples' eastern zone remains an unsettled area undergoing significant transformations.

One can only hope that future actions will adopt the best national and international practices and apply them to Naples, successfully integrating planning and transformation with sustainability and circularity in the use of space and resources.

Overall, the paper confirms the urgent need for a paradigm shift – moving away from the classical, post-expansionist model towards a more sustainable approach that enhances and regenerates existing urban areas, creating cities that are more resilient, inclusive, and environmentally balanced. In this process, the role of innovative public policies is crucial in promoting reuse and urban regeneration, with the ultimate goal of fostering a sustainable and circular development model.

As stated in paragraph 1, the paper represents a first step in an ongoing research project. Further development of the research will include a deeper application of methodological steps 1 to 4, as well as the addition of two further components not yet developed. The first is the evaluation criteria and framework development, to create a framework for assessing the compatibility of circular economy principles with urban regeneration strategies. This may involve using matrices or evaluative frameworks based on criteria such as material reuse, land optimization, heritage preservation, socio-economic inclusion, and climate adaptation. The second is the building of recommendations, to integrate findings and propose a model or set of guidelines for circular urban planning. This will involve comparing historical and current practices, identifying best practices, and offering policy recommendations for incorporating circular economy principles into future urban regeneration efforts.

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