

REVITALIZATION OF DANUBE CITIES THROUGH "ADAPTIVE REUSE": REINTEGRATION OF INDUSTRIAL HERITAGE INTO THE CONTEMPORARY URBAN LANDSCAPE

DOI: https://doi.org/10.18485/arh_pt.2025.10.ch48

_ Mitu-Ioan Sbîrnac

PhD Candidate in Urban Planning, Ion Mincu University of
Architecture and Urbanism - Doctoral School of Urbanism, Bucharest,
Romania, ionut.sbirnac@gmail.com, [0000-0003-0449-3319]c

ABSTRACT

The Danube cities are cities that have had a past considerably influenced by the forced industrialization, specific to the communist period, so that with the cessation of industrial activities, they have undergone a profound transformation, entering a process of decline. Industrial parks, technological zones and former factories, largely abandoned today, have left behind a disused, non-functional and polluted architectural landscape. These spaces can represent an immense potential for development, and the application of the principles of adaptive use ("Adaptive Reuse") can become the start of a sustainable and dynamic urban regeneration contributing to the strengthening of the identity and the economic revitalization of these cities.

By investigating the complex relationships related to the phenomenon of manifest urban magnetism between the force exerted by the river axis and that of the cities on its banks, I propose to explore the concept of adaptive use "as a method by which the (ex)industrial architectural heritage can be adapted to the new requirements of declining cities, both from the perspective of functionality and sustainability. The approach can contribute to creating the premises for attracting new economic activities, creating new jobs and, at the same time, integrating these structures into the social and economic networks of the city and, last but not least, a spatial and environmental relationship with the rest of the Danube cities.

Analyzing examples from a series of Danube cities in Romania, the paper explores the challenges and opportunities of such a transformation, with a focus on the long-term impact on the urban landscape and on the perception of the local community. Also, ways of intervention are discussed to restore the balance of the phenomenon of "magnetism" present in the Danube territory so as to restore relevance to cities on the verge of decline.

KEYWORDS _ *Adaptive Reuse, Danube cities, industrial heritage, urban regeneration, sustainability, economic revitalization*

INTRODUCTION

The Danube River, as a key geographical and cultural axis, has shaped the development of numerous cities along its course. In the Romanian context, many Danube cities such as Brăila, Galați, Tulcea, Călărași, Drobeta-Turnu Severin, and Giurgiu share a common legacy: they were heavily industrialized during the communist era, a process that defined their urban morphology and economic structure. Following the fall of the regime and the decline of centralized industry, these cities entered a prolonged period of deindustrialization, marked by economic downturn, population loss, and widespread urban decay.

Former industrial parks, technological zones, and factories were abandoned, leaving behind vast areas of underutilized land and obsolete architecture. These remnants of the past are now often associated with pollution, spatial fragmentation, and negative urban identity. However, they also represent a significant opportunity for sustainable urban regeneration – if approached with strategic vision and care.

This paper positions the concept of adaptive reuse as a potential catalyst for urban revitalization in Danube cities. Adaptive reuse involves the process of repurposing old industrial buildings and infrastructures to meet new needs while preserving their historical and architectural character. Through this lens, the paper engages with the broader research objective of the doctoral thesis titled “The Magnetism of Danube Cities”, which investigates the dynamic interplay between river systems and urban settlements.

The aim is to explore how adaptive reuse can contribute not only to functional and environmental sustainability, but also to restoring the “magnetism” – the power of attraction and urban vitality – that these cities once held. The introduction sets the stage for a deeper examination of case studies, theoretical frameworks, and practical implications related to post-industrial transformation in Romanian Danube cities.

THEORETICAL AND CONCEPTUAL FRAMEWORK

The concept of adaptive reuse has gained increased attention in recent decades as a sustainable alternative to demolition and new construction. Defined as the process of repurposing existing buildings for uses other than those originally intended, adaptive reuse preserves architectural heritage while allowing for contemporary reintegration of space. According to Plevoeets and Van Cleempoel (2011), adaptive reuse is both a design strategy and a cultural process, capable of linking the past and present in a meaningful spatial dialogue. In post-industrial urban environments, it emerges as a key instrument for unlocking the potential of derelict or underused structures.

In parallel, the notion of urban magnetism can be interpreted as a city's capacity to attract people, resources, activities, and investment. It encompasses factors such as spatial identity, social energy, connectivity, and symbolic capital. The Danube cities, once powerful economic poles due to their industrial bases and fluvial accessibility, are today facing a weakened magnetic field – marked by population decline, urban fragmentation, and economic disengagement.

The Danube River itself can be understood as a structuring element that historically generated flows – of goods, people, and ideas – contributing to the emergence of urban nodes along its banks. These cities, however, have struggled to maintain their strategic roles in the post-industrial era. The reactivation of industrial heritage through adaptive reuse may serve as a tool to reconnect with the symbolic and spatial dynamics of the river.

By integrating adaptive reuse strategies into urban regeneration policies, it is possible to revive dormant territories and reintroduce them into the active urban metabolism. This approach aligns with broader goals of sustainability, not only in environmental terms (through material reuse and reduced

energy consumption), but also in fostering social cohesion and economic resilience. Through this conceptual lens, the paper interrogates the transformative capacity of adaptive reuse as a response to urban decline in the Danube context.

THE ROMANIAN DANUBE CITIES: INDUSTRIAL LEGACY AND URBAN DECLINE

The Romanian cities along the Danube River are characterized by a common historical and spatial trajectory shaped by the forced industrialization policies of the communist regime. During the second half of the 20th century, cities such as Brăila, Galați, Tulcea, Călărași, Drobeta-Turnu Severin, and Giurgiu were transformed into industrial hubs. Massive factories, shipyards, cement plants, and chemical production centers were established with direct access to the Danube, integrating the river into a logistics and production system essential to the national economy.

This industrial growth, however, was neither organic nor sustainable. It was driven by centralized planning, disconnected from local economic contexts and often dependent on heavy subsidies. After 1989, the collapse of the communist economy and the transition to a market-based system led to the rapid decline or total shutdown of many industrial platforms. The consequences were immediate and severe: economic stagnation, mass unemployment, and significant outmigration, particularly of young and skilled residents.

Today, many of these once-strategic urban areas are characterized by disused and derelict industrial zones, often occupying large swathes of land near the city center or waterfront. These spaces are physically degraded, environmentally polluted, and socially isolated. Their presence represents a challenge but also an opportunity: a latent urban potential waiting to be reactivated.

In many of these cities, the lack of coherent urban policies for post-industrial regeneration has led to a state of inertia, with urban authorities struggling to repurpose large-scale industrial heritage in meaningful ways. Public interest in these areas remains low, and investment is scarce, partly due to their ambiguous legal status and high rehabilitation costs.

Understanding this context is essential in framing the application of adaptive reuse as a strategic approach to urban regeneration. The next sections of the paper will explore how this methodology can offer viable solutions for revitalizing Danube cities, transforming post-industrial decay into spatial and economic opportunity.

METHODOLOGY

This research adopts a qualitative, exploratory approach, grounded in spatial and urban analysis, with a focus on identifying patterns and potentials related to adaptive reuse in post-industrial Danube cities. The study relies on the case study method, which allows for an in-depth understanding of complex urban phenomena within their real-life context. This method is particularly appropriate given the diversity of urban transformations and socio-economic conditions present across Romanian Danube cities.

The selection of cities — Brăila, Galați, Tulcea, Călărași, Drobeta-Turnu Severin, and Giurgiu — was based on the following criteria: historical importance as industrial centers during the communist era, location along the Danube River, presence of large-scale derelict industrial infrastructure, visible symptoms of urban and economic decline, and varying degrees of local interest or attempts toward adaptive reuse.

Data collection was conducted through multiple sources:

- On-site observation of post-industrial zones and surrounding urban fabric
- Analysis of historical maps and planning documents (e.g., general urban plans, redevelopment proposals),
- Archival research on the development and decline of key industrial areas,
- Desk research including academic literature, press articles, and municipal reports,
- Demographic and economic data from national statistical sources.

The analytical process involved spatial mapping of key derelict sites, identification of functional, environmental and social characteristics, and the evaluation of their potential for reintegration through adaptive reuse strategies. The study also explored symbolic and relational aspects of urban magnetism – how space, function and identity interact in shaping perceptions of attractiveness and viability.

While the research is not based on large-scale empirical surveys or interviews, it provides a theoretical and contextual foundation that can guide further, more applied studies. Its aim is to frame adaptive reuse as a viable and urgent strategy for urban regeneration in cities along the Romanian Danube.

CASE STUDY: CĂLĂRAȘI

Located in southern Romania, on the Borcea branch of the Danube River, the city of Călărași is a representative example of a medium-sized Danube city with an industrial history marked by the communist era. The city's economic development was supported by several large industrial facilities, including:

- **SIDERCA Steel Plant (1979)**, one of the largest industrial investments of the communist regime, covering 650 hectares, with a planned production capacity of 10 million tons of steel per year and its own canal connecting it to the Danube. Closed in 1998, it remains a symbol of deindustrialization.
- **Sugar Factory**, a key player in the local food industry until 2007, when it entered insolvency. Recently, the land was acquired by the company LIDL for a future logistics center.
- **Pulp and Paper Plant**, built with British technical assistance, specialized in processing cereal straw from the Bărăgan Plain. After 2010, it was taken over by the Sofidel group and now stands as a successful example of industrial reuse.

These industrial platforms, currently largely inactive or underutilized, occupy significant land in the southeastern part of the city, close to the Danube.

Many of these sites are now abandoned, physically degraded, and environmentally challenged. However, they hold significant potential for adaptive reuse interventions due to their strategic location, existing infrastructure, and distinctive architectural character. By reconfiguring these sites for cultural, educational, or productive purposes, it is possible to reconnect these territories to the active urban fabric.



Figure 1: Decommissioned industrial zone in Călărași (Source: Author's own photograph, August 2023)

RESULTS AND DISCUSSION

The Călărași case study highlights the real and latent potential of former industrial sites as assets for sustainable regeneration. The examples of SIDERCA, the Sugar Factory, and the Paper Plant illustrate various trajectories of post-industrial transformation—from total abandonment to successful reuse. Their size, structure, and proximity to the Danube provide a solid foundation for reimagining their roles in the contemporary city.

Adaptive reuse emerges here as a strategic tool capable of addressing multiple urban challenges. In the case of Călărași, it can serve to counteract spatial degradation, reconnect marginal areas with the urban core, and stimulate local economic circuits through new uses such as logistics, cultural venues, or green industries.

One of the most significant observations is that adaptive reuse, when properly guided by planning and investment, can reintegrate industrial memory into current urban development, providing not only economic but also symbolic and social value. The transformation of the former Paper Plant by Sofidel into a modern tissue production facility is a positive model, demonstrating the feasibility of conversion within existing industrial envelopes.

On the other hand, the decay of the SIDERCA platform and the uncertain interim condition of the Sugar Factory site point to the urgent need for strategic planning frameworks that go beyond land speculation and short-term interests.

As such, adaptive reuse in Călărași is not just a design opportunity—it is a policy and governance challenge. Coordinated action between public institutions, private stakeholders, and civil society is essential to unlock the potential of these spaces and re-anchor them in the city's socio-economic life. From a functional perspective, these areas are well-positioned to support new urban programs due to their proximity to the city center and the Danube waterfront. Their large building volumes and structural resilience make them suitable candidates for creative industries, cultural venues, co-working hubs, or hybrid public-private spaces. Such programs have the potential to restore activity, attract residents and visitors, and reestablish a productive relationship between the built environment and the urban community.

In terms of urban magnetism, adaptive reuse can serve as a reconnection mechanism — linking the neglected industrial past with a more vibrant and diversified urban future. Rather than viewing industrial heritage as a liability, cities like Călărași can leverage it as a resource for building identity

and economic resilience. The symbolic value of revitalizing iconic local landmarks can play a major role in rebuilding civic pride and social cohesion.

However, the transformation of such zones is not without challenges. Among the most pressing are issues related to land ownership, environmental contamination, lack of strategic urban planning, and limited access to funding. Without coordinated action from public authorities, private stakeholders, and the civil society, these opportunities risk remaining untapped.

Moreover, the lessons from Călărași may be relevant for other Danube cities that share similar trajectories. Developing regional policies focused on industrial heritage reuse, supported by cross-border cooperation and European funding mechanisms, could enhance the scalability of successful interventions and encourage a collective reimagining of the Danube urban landscape.

CONCLUSIONS

This paper has explored the potential of adaptive reuse as a strategic tool for revitalizing post-industrial Danube cities, with a specific focus on the case of Călărași. The analysis has shown that the physical remnants of the industrial era — although currently degraded and underutilized — hold significant spatial, historical and symbolic value. If approached through a coherent and inclusive urban vision, these structures can be reintegrated into the contemporary urban fabric, thus transforming spaces of abandonment into spaces of opportunity.

Adaptive reuse offers a multi-dimensional framework for regeneration: it supports sustainability by preserving existing materials and reducing the ecological footprint; it fosters economic revitalization by creating new spaces for innovation and production; and it enhances urban identity by maintaining a tangible connection with the city's past. In doing so, it contributes directly to restoring the urban magnetism that has been eroded in the transition from centralized industry to fragmented post-industrial reality.

The case of Călărași illustrates both the urgency and the feasibility of such interventions. While challenges remain — legal, financial, environmental — the potential impact justifies the effort. Policymakers, urban planners, and local communities should consider adaptive reuse not as a secondary option, but as a core strategy for the future of Danube cities.

Scaling up this approach across the Danube territory, supported by targeted funding and regional cooperation, could enable a new chapter of sustainable development, one that reclaims and reimagines industrial heritage as a driver of urban resilience and renewal.

RECOMMENDATIONS

Based on the findings of this research, several recommendations are proposed to guide future actions in the field of adaptive reuse and urban regeneration in Danube cities:

- **Develop integrated urban policies** that explicitly include adaptive reuse as a core tool for revitalizing industrial heritage areas.
- **Promote interdisciplinary collaboration** between architects, urban planners, economists, ecologists, and sociologists to ensure holistic regeneration strategies.
- **Encourage public-private partnerships** for the redevelopment of former industrial sites, with incentives for investment in creative and sustainable projects.
- **Support bottom-up initiatives and civic engagement**, giving local communities a voice and role in reimagining their urban landscape.

- **Secure targeted funding** from national and European programs dedicated to cultural heritage, urban innovation, and green transition.
- **Create a regional platform** for knowledge exchange and best practices in adaptive reuse across Danube cities.
- These recommendations are meant to support a broader, long-term vision for the Danube region — one that balances memory and innovation, built heritage and ecological sustainability, economic growth and social inclusion.

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