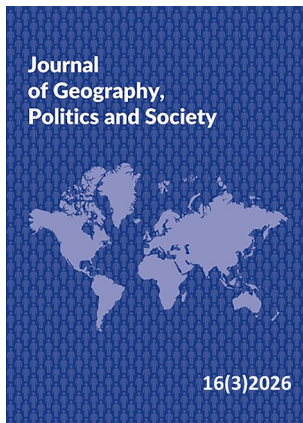




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Comparative study on the urban regeneration of former industrial sites in the municipality of Oradea. Developments between 2020–2024, realities and perspectives

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Abstract

Urban regeneration of abandoned industrial sites or brownfields presents both challenges and opportunities for cities around the world, helps to clean up and revitalize inner cities by reintegrating abandoned, inactive or underutilized sites, reduces urban sprawl and eliminates chaotic/unplanned development by strengthening the spirit community, creating jobs and increasing local tax revenues, revitalizing communities and renewing economic activity, particularly in underserved urban areas. By addressing environmental, social and economic aspects, through urban regeneration, these brown spots can be transformed into sustainable, vibrant and inclusive urban spaces. This study is a continuation of the study published in the book “Architectural Reflections. An architectural study regarding the urban regeneration of former industrial sites in Oradea”, with the aim of analyzing the subsequent evolution of the urban regeneration process and reintegration into the urban fabric of the lands and buildings where the former factories operate.

Key words: urban regeneration, renewal, industrial sites, Romania, factory.

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1. Introduction

The globalization of industry in recent decades has had a profound effect on traditional industrial areas around the world, which due to the lack of experience, in the mechanisms of the market economy of decision-makers, has led to the collapse of entire industrial branches (e.g. metallurgy) and has produced heaps of disused industrial facilities, underutilized or even contaminated land. Along with institutional reforms, the economic systems of the former socialist countries moved from state

ownership, characterized by centralized planning, to a system governed by the capitalist principles of private property and competition, privatization processes, and the fragmentation of land and building ownership transformed the former industrial areas into a mosaic of obsolete and reused industrial buildings, further exacerbating the spatial discontinuity of the transition zone.

The institutional, economic and societal trends that characterized the post-socialist transition in Central and Eastern European countries have drastically reshaped urban development. Moving away from the legacies of the communist past was

achieved through multiple transformational dynamics of institutional, social and urban changes. Although institutional reforms have been largely achieved, the adaptation of urban land use patterns to new social conditions is still ongoing.

The process of deindustrialization in Europe and in highly developed countries has created, vast unused and abandoned spaces, especially in the urban periphery. Originally built on the outskirts of cities, many industrial complexes have been swallowed up by the sprawling urban environment, with communities facing downsizing and factory closures, which have resulted in underutilized or abandoned—and almost always contaminated—industrial sites. In addition, this phenomenon produced “black holes” in the urban morphology, filled with unused and empty volumes ready to be regenerated (Grimski, Ferber, 2001).

When businesses close, offices move away and economic activity declines, the mechanisms that operate a city are idle. Vacant spaces and land are often perceived as “failed”, reflecting urban decline and economic disaster.

To create more inclusive, fairer and more sustainable cities, the interactions between these harmful social, economic, spatial and environmental consequences of the three decades of post-socialist transition require extensive, effective and holistic urban regeneration programs.

If these buildings and sites are not restored to useful life, continued deterioration will exacerbate environmental problems and weaken the economic base of host communities. Local decisions and strategies to regenerate these sites can be strengthened by actions to reduce regulatory barriers to reuse and expand the availability of existing resources for brownfield projects. Urban decline is not just an economic problem; it can also lead to loss of community identity, which depends on place attachment to produce a state of psychological well-being (Galster et al., 2001).

Land is one of the most profitable commodities. Human production and survival depend on the land and the material resources it provides. Using land to build sprawling cities, attract investment, and accelerate economic development is a common and effective policy tool in many countries.

Cities face an increasing demand for land to accommodate their growing populations. Meanwhile, cities have become responsible for providing more services to more people, but they often lack the resources to do so.

Urban regeneration can help cities address the growing demand for land by densifying existing urban cores, particularly pockets of underutilized or

disinvested land. Higher density is associated with economic growth and social integration. Denser and more transit-friendly cities also help reduce carbon emissions, reduce pollution and increase resilience.

At the level of each city, the situation is often considerably more complex, and positive and negative attributes are less easily compared. Cities are not finished objects, land use changes, parcels are redeveloped, the urban area itself expands and occasionally shrinks. The pressure to change land uses can be based on a number of reasons, be it changes in the economy, environment or social needs (Jones, Evans, 2013).

Urban regeneration is a process that aims to transform the urban space, involving different fields such as economic, social, environmental, architectural, but also urbanistic, with the collective aim of improving the quality of the urban environment and living conditions (Boca, 2020, p. 23).

2. Urban regeneration

Urban regeneration involves a series of major interventions at the city scale, aiming at the action of reconstruction, economic and social relaunch, recycling of its built resources and environmental protection. It is a field of urban planning and can be categorized as a method by which the growth and evolution of the city are controlled. Urban regeneration aims to solve the economic, social, urban/architectural and cultural problems of degraded areas (Boca, 2020).

The demand and consumption of space is a final characteristic of the postmodern development of the city of Oradea. Influenced by a neoliberal policy that is manifested by the separation of socio-spatial elements and functions into small elements, and by the migration of the population from the city center to the outskirts, including to the neighboring communes, respectively by the formation of residential neighborhoods, restrictive in price with shopping malls”, located in a dispersed manner in the city, originally oriented to meet the needs of neighborhoods inhabited by people with medium/high incomes. At the same time, there is a conformation of the industrial or business area along the access roads, as well as in new industrial parks, located on the outskirts, through the relocation of economically viable industrial units, simultaneously with the redevelopment of other investment opportunities. Moreover, the newly developed residential areas in the city such as the Europa Quarter, the Grigorescu Quarter, the Tineretului Quarter, as well as the metropolitan rural areas,

were developed horizontally in the form of single-family houses, gradually abandoning the concept of housing blocks.

The current development trajectory of Romanian cities is not sustainable. This is characterized by negative trends such as urban sprawl, under-urbanization, rising housing and utility costs, alongside environmental challenges, such as pollution and heat-generated extreme weather events (Cocheci, Pătrișor, 2023).

The double challenge of uncontrolled urban expansion and contraction faced by Romanian cities requires a flexible approach in which the role of the spatial planning system increases and changes from the regulation of land use to the integration, balancing and transposition of sectoral development directions in the realities of the built environment (Cocheci, Pătrișor, 2023). For years, scholars have argued that sprawling patterns of urban and suburban development create negative effects, including habitat fragmentation, water and air pollution, increased infrastructural costs, inequality, and social homogeneity (Squires, 2002).

In general, all cities are subject to continuous revision of their historically formed landscapes. However, there are periods of more radical changes that usually concern specific areas within urban regions. A recent example is the dramatic changes taking place in post-communist cities with suburban areas as a prime example of processes where new human activities significantly reshape existing urban patterns and the spatial organization of known areas (Grigorescu et. al., 2012; Cocheci, Pătrișor, 2023).

Reactivating brownfields also helps reduce urban sprawl and inefficient development.

From this point of view, we distinguish two types of forms:

- the spontaneous expansion of cities - the absorption of villages occurs when the city touches the neighboring villages, which it engulfs over time (Surd, 2003);
- directed (planned) expansion.

City sprawl into adjacent urban areas has some common characteristics that pervade the literature and that can help us understand and even measure its occurrence. These include (fig Fig. 1):



Figure 1. Common features of the urban sprawl phenomenon. Processed image
Source: Song, Knaap (2004).

The research methods are composed of literature reviews, comparative and qualitative analyses, and survey research related to the process of socio-economic redevelopment of former industrial districts.

Oradea has entered a development phase focused on renewal and redevelopment, and one of its topics is the large amount of industrial land where modern industrial buildings are located. With urban expansion and the modernization and relocation of manufacturing industry, a large number of industrial enterprises closed or moved. Due to operating costs, pollution control, industrial disposal and other factors, many industrial buildings or land have been abandoned.

According to the studies carried out between 2015–2020, the results of which were published by the author in four specialized articles and in the book *Architectural Reflections: An Architectural Study Regarding the Urban Regeneration of Former Industrial Sites in Oradea*, following observations from the field and the conducted analyses regarding the economic evolution of this city, no less than 37

industrial sites have been identified, which are in various stages of destruction/abandonment or on which, in part, economic activities are still carried out, according to the object of activity.

3. The study

The time scale of this study: The statistical data related to this study covers the period 2020–2024.

Urban regeneration has become a popular research topic globally against the critical challenges facing cities with the degradation of urban function, urban fabric and living conditions of residents. Applied to the urban context, it would mean reviving previously beneficial and productive land, now abandoned, into new useful and profitable land. Urban regeneration is recognized as one of the most comprehensive and effective tools that governments can use not only to stimulate economic development, but also to promote more inclusive, resilient, safer and more sustainable cities.

In addition to improving the physical conditions of buildings and the urban living environment, urban regeneration also contributes to improving the function of a city and addressing urban challenges such as traffic congestion, inadequate public space and insufficient provision of urban infrastructure (Li et al., 2022).

The renovation and regeneration of unused real estate, with particular attention to the historical industrial heritage, is becoming an increasingly influential issue in strategic choices for the development of sustainable cities. In particular, the regeneration of warehouses and historic buildings allows the memory of the architectural characters of the past to be preserved, transforming them into new functional centers within the urban structure. Adaptive reuse is an important design strategy for achieving sustainability, as it ensures a continuous building life cycle and prevents building destruction.

Industrial heritage consists of the remains of industrial culture that have historical, technological, social, architectural or scientific value and contains both tangible and intangible industrial vestiges of

historical, sociological, architectural, technological or aesthetic value, including factories, workshops, mills, warehouses, shops and other industrial structures.

The specific data were collected in four different years (2020, 2021, 2022 2023 and 2024), and compared with the period of 2015–2019. (Tables 1-2).

Industrial production activities cannot operate efficiently consistently without the financial support of the entire society. Industrial renovation funds are very important for the purchase and maintenance of industrial equipment, renovation and construction of buildings. Undoubtedly, investment in industrial renovation has an impact on the processes of abandonment and regeneration of industrial heritage sites (Morar et al., 2021[KP5.1]).

Certainly, one of the most important benefits of recycled urban sites is the prevention and reduction of urban sprawl and unplanned developments:.

- the choice of the industrial heritage reuse function – the purpose of reusing original industrial buildings or sites – shows that, in the last 30 years, the number of industrial heritage

Table 1. Former industrial sites and their operational status in 2018

Demolished	Reconstructed	In degradation	Functional
Alumina Plant	Alfa Mobila S.A	Miorița S. A.	Plastor
Spirit and Yeast factory	Sinteza, Calea Borșului	Crișul and Arta	CET I
CET II	Milk Factory	"1 Mai" Fur Factory - Rovex	UAMT
Oil Factory	Înfrățirea Plant	Mechanical and Spare Parts Plant	Solidaritatea Shoe Factory
Emilia Mill	Furniture Factory	Avântul Cannery	State-owned polygraphic enterprise
Oradea Greenhouses	Brick Factory	The Asbestos Factory	Chair Factory
S.C Cominca S.R.L	Brewery	Electrometal	
Adria Mill	The Garment Company Oradinum	Sugar Factory	
	S.C Drum Nou	The Industrial Parts and Installations Plant	
	Moara Răsărit Mill	Sinteza Paint Factory, Calea Clujului	
	Metalica S.A		
	The Slaughterhouse		
	ChimProd		
TOTAL: 37 studied industrial platforms			
8	13	10	6

Source: Boca (2018)

Table 2. Former industrial sites and their operational status in 2018

	Site	Existing buildings on site	Total (Site and existing buildings)	%
Located in central area	2	10	12	32,44
Located in the pericentral area	3	13	16	43,25
Located at the perimeter	3	6	9	24,31
TOTAL	8	29	37	100

Source: Boca (2018)

sites in operation in Oradea has gradually decreased, while the number of abandoned and reused industrial sites has gradually increased;

- the dominant character of the strategy applied in the intervention in disused areas (Boca, 2019). [KP6.1]

The revitalization of less used, unused or degraded urban spaces by using them as places for various cultural activities is part of these ideas.

Means of urban regeneration are often based on ambitious and permanent transformations of the urban space, such as:

1. building cultural infrastructures and spectacular buildings for cultural or recreational use;
2. reconstruction for residential purposes;
3. mixed-use development – residential spaces, services and facilities, use of green spaces and regeneration of historic buildings and sites;
4. reconstruction and redevelopment for mostly public and governmental use;
5. preserving the unique aesthetics and character of the abandoned industrial ruin.

Industrial ruin can be approached from a design point of view to show how buildings can exist as functionally dead pieces of architecture that not only have a positive effect on the surrounding urban areas (as opposed to a negative effect so often attributed to vacant and abandoned buildings) but serve as public remnants of the transitory nature of civilization (Loures et al., 2015).

In recent years, new design strategies have been devised for the recovery of abandoned industrial sites, focusing on the durability, quality and multifunctionality of space, with attention to historical, socio-economic and cultural aspects (Loures, Panagopoulos, 2007). Sustainability involves meeting the needs of the present without compromising the ability of future generations to meet their own needs.

Like other natural resources, land is a shared investment that should be reused and recycled rather than consumed and abandoned after use. Sustainable development is the key to successful urban regeneration, providing opportunities for urban renewal and building truly livable communities: efficient, compact, vibrant urban neighborhoods integrated with public transport systems that offer a mix of uses as well as affordable housing.

Redirecting population growth and business growth to already urbanized areas is critical to promoting sustainable communities. Applying sustainable principles to managing land use and

growth requires that growth be redirected from sprawling fringe areas back to our urban cores, where people, services and infrastructure already exist. Building urban areas positively increases population density, providing critical mass to support local services and public institutions. Recycling process is a closed loop process and, as such, is the best for sustainable development (Boca, 2020; UN-Habitat, 2012).

Redevelopment of former industrial areas not only reduces pressure on green corridors, but also offers the opportunity to bring residential areas closer to areas of work, leisure and education, contributing to a regeneration of civic pride and implying momentum. For city restoration, an increasingly important aspect in post-industrial reconstruction Building design, landscape design and urban design must be brought together to provide a more integrated, skillful and efficient design process.

Between the years 2020–2024, the author studied the evolution of the implemented urban regeneration programs, of the former industrial sites in the municipality of Oradea, and the centralization of the study results can be summarized as follows in Table 3 and Table 4, the informations being redacted and observed on site by the author.

4. The situation today

In the post-industrial context of Eastern Europe, urban regeneration has emerged as a critical strategy for economic revitalization and spatial reconfiguration. Oradea, a medium-sized city in northwestern Romania, exemplifies this trend through a series of integrated urban regeneration projects initiated over the past two decades. These efforts have been instrumental in addressing the decline of former industrial zones and aligning the city with contemporary urban development paradigms centered on sustainability, livability, and economic diversification.

Several emblematic cases illustrate this transformation, such as Rovex on Calea Clujului Street. The architects had to find ways with the local authorities to integrate the existing buildings with new ones. These transformations are indicative of a broader process of urban repurposing, whereby obsolete industrial platforms located in central urban zones have been systematically reintegrated into the city's functional and morphological structure (Boca, 2020).

Table 3. Types of urban regeneration intervention through 2020–2024 in the municipality of Oradea

Types of interventions	Intervention type variables	Examples
A. Sites subject to an ongoing urban regeneration project	B.1 partial or total demolition authorizations issued and applied, without new constructions being built	Sugar Factory, Avântul, SICOOP - Electrometal on Calea Clujului; Cooperativa Munca Invalizilor
	B.2. sites for the restructuring of which the Chief Architect's opinion has been requested, or the necessary stages of PUZ elaborations are being completed	Gas Bottling Factory, on. Calea Clujului Brick Factory- on. Calea Clujului
	B.3 sites where integrated urban regeneration projects have been implemented	The complex site on which Înfrățirea, Chimprod, Furniture Factory on Tudor Vladimirescu street, F-ca de Lapte were located
	B.4 sites where regeneration projects are implemented after the complete demolition of former buildings	Abatorul, CET II
B. Sites where regeneration projects are implemented after the complete demolition of former buildings		Stove Factory Metalica
C. Sites on which integrated urban regeneration projects are currently being implemented, simultaneously with the preservation and functional reconversion of some buildings located on the site		
D. Sites subject to recent functional reconversion interventions		Drum Nou, Victoria
E. Industrial sites on which urban regeneration projects have not been carried out/implemented although the land is mostly or totally free of buildings		Factory of teast and spirit, Oil factory, BJATM,

Source: Observations done on site by the author.

Table 4. Forms of intervention through 2020–2024 in the municipality of Oradea

Site	Surface	Form of intervention
EXMOB	24,000 sqm	Existing buildings were demolished and spaces were proposed for trade and catering, tourism, offices, commercial galleries and housing were built in mixed buildings
The complex site composed of the neighboring lands on which the former companies Infratrea-milk factory-Chimprod-Exmob furniture factory operated	<i>aprox.</i> 350,000 sqm	The main form of intervention on the site was demolition. Tourist accommodation, residential, commercial and office spaces were built, but some hall-type storage space was retained and repurposed
Rovex	4.,420 sqm	Partial demolition. Construction of a residential complex with the integration of two old building bodies into the new complex. The complex with six buildings includes blocks with 164 apartments (1–4 rooms) and 209 underground parking spaces, 11 commercial spaces, a supermarket and a restaurant
ISICOOP — Electrometal on Calea Clujului	24,508 sqm	Total demolition. This year, the city hall issued, two demolition permits for the Cluj address 202. One at the request of Vannisis SRL, which refers to 17 building bodies at no. 202A and one for KB Great Land Investiții, at no. 202
Cannery – Avântul	34.,757 sqm	Demolition of the building- in 2022. A residential neighborhood will be built on the site of the former factory. The proposed height regime for the blocks is half-basement/basement plus ground floor, plus 5 floors and 2 more set-back floors
Beer factory	38.,000 sqm	Demolition of buildings and decommissioning of the land. Construction of a complex with mixed function, commerce and recreation, a modern business center, a supermarket and a place of worship

Table 4. Continued

Site	Surface	Form of intervention
CET II	142 ha	Demolition. Private investments in industrial functions
Stove factory Metalica, Str. Sovata no. 4	13.,600 sqm	Demolition in 2016. Construction of a hypermarket, part of the land being taken over by the town hall for the creation of an urban mobility corridor, towards the river bank
PECO warehouse, Calea Clujului 170	21,009 sqm	Total demolition in 2021 – decontamination and ecological remediation works. 2023 – urban plan-functional conversion, from industrial area to residential area and functions
Cooperativa Munca Invalizilor	5,020 sqm	Total demolition. Collective housing buildings will be built with commercial spaces/offices on the ground floor, height regime S+P+2E+E3retracted, arrangement of green spaces – 18 apartments, 2 commercial spaces, 2 apart-hotels and 28 parking spaces
Abatorul Oradea (SC Cominca)	54,293 sqm	Total demolition. Construction of residential complex with over 1,200 apartments
Liquefied Gas Bottling Factory, on. Calea Clujului	44,642 sqm	Tabula-rassa demolition. The development of mixed functions and the construction of a complex of collective housing — 11 building bodies, of which 9 in the S+P+5E+ER height regime with the destination of collective housing, one building with the S+P+5E+R height regime with apart-hotel destination and a building body with P+E height regime for neighborhood amenities (kindergarten/nursery).
Sugar factory	354,000 sqm	Partial demolition. Steps for the development of a PUZ, land use change, in residential constructions, respectively for apartments and a side area kept for logistics
Oradinum, Independenței street 5	5,400 sqm	Functional reconversion. The Oradinum clothing factory, , entered liquidation on October 1, 2008. In 2021, the owners of the building, rehabilitated the facades, and the spaces were rented. A large part of space is used for cultural activities – Oradinum Hall – 3rd floor
Drum Nou (SC AURA)	5,700 sqm	Functional conversion. Building rehabilitation and restructuring
Shoe factory – Solidaritatea	15,400 sqm	Functional reconversion. Restructuring – rented premises
Cooperativa Victoria. Calea clujului- Stânci street	4,800 sqm	Building rehabilitation
S.C Rovex, Calea Clujului street	13,337 sqm	Functional Reconversion. Industrial and office spaces, as well as spaces for sports and recreation (climbing space of almost 600 sqm)
Sinteza-paint factory — Calea Clujului street	9,500 sqm	Functional conversion. Rehabilitated

Source: Observations done on site by the author.

5. Conclusion

The local authorities in the municipality of Oradea understood the necessity and opportunity of implementing integrated projects of urban regeneration of former industrial sites, a fact that led to the urban reintegration and restoration of the use of these lands and communities. The urban regeneration strategies implemented at the city

level, including through the support given to investors, as well as the pressure exerted on the owners of unused or abandoned buildings and land, have contributed to the acceleration of the urban regeneration process and the improvement in architecture and the urban image.

The study reflects the fact that in the last four years, both the local authorities and the owners of the land/buildings located on the former industrial sites have realized the economic value and the enormous development potential, through the

regeneration of these sites. More and more regeneration projects have been implemented, and large areas of brown land have been recovered and reintroduced into the economic-social circuit.

The need to restore the urban image, simultaneously with the new trends, in the evolution of the urban structure, which indicate a return of the population, towards the central area thanks to the facilities, correlated with the limitation of the excessive expansion of the city, require the regeneration and urban reintegration of the lands on which the former operated industrial objectives,

particularly valuable from an economic point of view, but also from a strategic point of view.

Redirecting population growth and economic development to already urbanized areas is essential to promoting sustainable communities. Applying sustainable principles to land use management requires that growth be redirected from adjacent rural areas back to urban cores, where people, services and infrastructure already exist. Building our urban areas positively increases population density, providing critical mass to support local services and public institutions.

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