

Adaptive Reuse of Industrial Heritage in the Perspective of Circular Economy: A Tool for Sustainable Development

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Abstract. *The adaptive reuse of industrial heritage has represented a solution included in the sphere of circular economy that meets the challenges of sustainable development. Furthermore, researchers and professionals recognize the need for in-depth analysis of the conservation and adaptive reuse of industrial heritage in the context of deindustrialization, urban dynamics, and globalization standard solutions. The purpose of the study is to evaluate the abandoned industrial heritage sites in Bucharest from the perspective of adaptive reuse in accordance with the principles of the circular economy, emphasizing their conservation and optimal valorization and responding to environmental, economic and socio-cultural challenges. This study answers the research questions: what are the factors that generated the large number of abandoned industrial monuments? What are the barriers related to planning the adaptive reuse of industrial monuments? The case study method and the multi-criteria model specific to industrial heritage were used to evaluate the heritage values and optimal reuse. Two case studies were carefully selected according to the criterion of representativeness, highlighting their heritage valences (historical, architectural). Also, the case studies are examples of abandoned industrial heritage that show different stages of degradation, a fact that justifies their conservation and reuse. This study has an applicative character due to the fact that research results can be transferred to the socio-economic and decision-making environment. The proposals based on multi-criteria analysis of adaptive reuse of industrial monuments can be replicated to other case studies located in large cities where the pressure of urban dynamics on heritage buildings is high.*

Keywords: industrial monuments, circular architecture, multi-criteria assessment, circular governance, financial instruments, economic added value, Bucharest.

Introduction

The circular economy (CE) is oriented towards increasing the value of products and materials through reuse processes, with the aim of reducing the consumption of waste, energy and materials (Busu, Busu, 2018; Gravagnolo et al., 2024).

DOI: 10.2478/picbe-2025-0415

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Field of architecture can offer solutions to challenges related to sustainable development (Della Spina et al., 2023). The adoption of circular principles in construction ensures sustainable urban planning and benefits for the environment: adaptive reuse projects of abandoned or underutilized buildings as an alternative to demolition (Merciu, 2024) and fewer new resources are used (Nocca et al., 2024; Della Spina et al., 2023). At the same time, adaptive reuse contributes to limiting land consumption, one of the major challenges in the current period (Peptenatu et al., 2012; Della Spina et al., 2023).

The adaptive reuse of heritage buildings in the perspective of the circular economy contributes to the achievement of multiple objectives, such as the preservation of heritage values (Gravagnolo et al., 2024; Nocca et al., 2024), extension of their life cycle (Nocca et al., 2024), economic viability (Gravagnolo et al., 2024), revitalization of cities through new creative/productive activities and new socio-economic actors (Della Spina et al., 2023), environmental benefits (solutions for low energy consumption) (Gravagnolo et al., 2024; Nocca et al., 2024), sense of belonging, increased appreciation of local culture (Gravagnolo et al., 2024; Meng et al., 2023; Merciu et al., 2021; Della Spina et al., 2023). Therefore, cultural heritage represents the entry point for the implementation of this new model of urban development (Della Spina et al., 2023), and adaptive reuse projects, integrated into strategic visions, can contribute to a transition towards sustainability processes based on circularity. The implementation of this sustainable development model is associated with various challenges, such as conflicting values and interests between stakeholders, reduced management capacity of the public administration, lack of resources correlated with expensive restoration and maintenance costs, low public budget allocated for restoration of historical monuments (Dascălu et al., 2024; Gravagnolo et al., 2024; Della Spina et al., 2023).

In recent years, special attention has been paid to the adaptive reuse of industrial heritage, a special component of cultural heritage. This fact is related to the awareness of the key role that industrial heritage can play in urban regeneration process for sustainable development (Han Han & Zhang, 2022; Della Spina et al., 2023), especially since the number of abandoned industrial monuments is high (Oevermann, 2020).

In this context, this paper aims to analyze two abandoned industrial sites in Bucharest from the perspective of adaptive reuse in accordance with the principles of the circular economy, emphasizing their conservation and optimal valorization, responding to environmental, economic and socio-cultural challenges. The results provide useful information for the complex decision-making phase, as a series of interventions are proposed in a preliminary stage and possible funding sources are identified. The paper answers the research questions: what are the factors that generated the large number of abandoned industrial monuments? What are the barriers related to planning the adaptive reuse of industrial monuments?

A research gap was identified in CE literature which is related to the difficulty of implementation of CE due to the lack of knowledge, especially in the construction sector. This paper is design to increase the awareness of the role of CE both for the limitation of waste in constructions, as well as for the adaptive reuse of industrial monuments among policy-makers and entrepreneurs.

The first hypothesis of the study is related to a negative correlation between high costs and the dynamics of reuse projects of abandoned industrial heritage buildings. The second hypothesis is formulated on the positive relationship between the location of abandoned industrial heritage assets within cities and adaptive reuse projects. The third hypothesis is formulated on the positive

or negative relationship between the surface occupied by abandoned industrial monuments and the possibility of starting reuse projects.

Literature review

Industrial heritage has multiple values (such as historical, architectural, technological, cultural, scientific, social, symbolic, aesthetic) (Liu et al., 2024; Meng et al., 2023; Merciu et al., 2022; Nocca et al., 2024) as well as a series of characteristics that individualize it as a distinct category of cultural heritage: complexity, uniqueness, rarity, authenticity and integrity (Han Han, Zhang, 2022; Meng et al., 2023; Merciu, 2024).

In the context of deindustrialization, numerous industrial heritage assets, becoming redundant, were abandoned. This fact determined from the middle of the 20th century the awareness of the heritage values of the industrial monuments that were monitored and preserved, especially those with a monumental character. Valuable industrial heritage assets were also included in the list of World Cultural Heritage. The second stage was focused on the adaptive reuse of industrial heritage which plays an essential role in the transition to a circular economy (Merciu, 2024).

Large number of abandoned industrial heritage assets imposes the urgency of assigning them new functions. Conservation practices have associated new challenges, such as conflicts between heritage conservation and contemporary architecture, and the increasing demand for the reuse of industrial monuments as a means of supporting urban development (Overmann, 2020). Taking into account several particular characteristics (large surface area, location in peri-central areas of cities, flexibility due to internal compartmentalization, connection to infrastructure elements, high accessibility), industrial monuments have a great potential for different ways of adaptive reuse. At the same time, these factors increase the economic value of abandoned industrial buildings and generate the adoption of standardized solutions for their reuse: e.g. commercialization projects due to the strategic location and high accessibility that ensure a higher economic value of the land. In this situation, sometimes the economic value of the former industrial buildings prevails at the expense of the patrimonial values. As a result of the complexity of industrial heritage assets, the adaptive reuse requires a specific management focused on the multi-criteria analysis by considering a value evaluation system (Claver et al., 2018; Liu et al., 2024; Nocco et al., 2024; Merciu et al., 2022) that refer to the ability of the asset to accommodate possible new activities and a minimal architectural intervention (Overmann, 2020). The multi-criteria method, as a tool for managing the complex decision-making process (Claver et al., 2018; Liu et al., 2024; Meng et al., 2023), is considered of great interest due to its usefulness in solving various problems associated with the conservation and life cycle extension of industrial monuments, providing a basic reference for the protection of architectural heritage.

Methodology

To elaborate the study, analysis of specialized literature, case study method, field campaigns and multi-criteria analysis were used.

The authors propose the adaptive reuse of two abandoned industrial heritage sites using a set of criteria adapted to industrial monuments (Claver et al., 2018; Liu et al., 2024; Nocca et al., 2024; Meng et al., 2023; Merciu et al., 2022; Della Spina et al., 2023). In this study, five types of classification of heritage values are evaluated, to which economic value is added (Liu et al., 2024; Della Spina et al., 2023). Historical, architectural, technological and social values are the most

frequently evaluated categories, while other values vary depending on the research situation (Liu et al., 2024). The usefulness of the multi-criteria analysis consists in ensuring the compatible conservation and reuse of abandoned industrial monuments (Claver et al., 2018).

The first stage consisted in the creation of a larger sample of industrial monuments in Bucharest. The analysis of the sample allowed the highlighting of various types of industrial monuments. Two industrial monuments were selected as case studies according to different criteria: they are historical monuments of national importance, are inactive and belong to two typological ranges. They are representative industrial monuments for the electricity and milling industry at the national level due to their historical and architectural values. From the point of view of technical value, old engines of both industrial sites are exhibited at the National Technical Museum. Moreover, their state of degradation justifies the urgent inclusion in adaptive reuse projects. From the point of view of ownership, the Assan Mill belongs to a private owner, and the Electric Plant is owned by Electrica SA.

The second stage consisted in the evaluation of heritage values and morphological characteristics based on the analysis of previous studies (table 1).

Table 1. Proposed evaluation framework for adaptive reuse of industrial monuments

Criterion	Authors	Indicators	Index explanation
Technological value (A)	Claver et al., 2018 Lui et al., 2024 Meng et al., 2023	Technological exclusivity (A1) Technological innovation (A2)	Installations and equipment considered unique or representative examples Equipment considered pioneering application
Historical value (B)	Lui et al., 2024 Merciu et al., 2022 Della Spina et al., 2023	Identifying historical information (B1) Historical events or historical personalities (B2)	Antiquity; belongs to a historical period that gives to monument added value due to small numbers of examples today; Relationship between monument and environment in which it is located and typical events and historical personalities
Architectural /artistic value (C)	Claver et al., 2018 Lui et al., 2024 Meng et al., 2023 Merciu et al., 2022 Della Spina et al., 2023	Architectural or artistic style (C1) Structure (C2) Artistic characteristics of heritage ad integrity of information preservation (C3)	Building / complex of buildings have outstanding architectural style Body structure, shape, space form Degree of preservation of the integrity of the artistic characteristics Number of remains
Cultural value (D)	Liu et al., 2024 Meng et al., 2023 Merciu et al., 2022 Nocca et al., 2024	Representativeness and symbolism of Regional Characteristic culture (D1) Representativeness and Typology (D2)	Industrial heritage as an important symbol of regional characteristic culture in Bucharest Heritage monuments are a representative case in the development and evolution of several industrial branches

Criterion	Authors	Indicators	Index explanation
Social value (F)	Liu et al., 2024 Nocca et al., 2024	Relevance of social life (F1) Collective memory attribute(F2)	Heritage as public space that hosts community activities; relevance between heritage and community everyday activities The common historical memory related to industrial monuments
Economic value (E)	Liu et al., 2024 Merciu et al., 2022 Nocca et al., 2024	Economic value of heritage and its environmental resources (E1)	Value of monument, value of location, accessibility by public transport, public service facilities in adjacent area, value of the quality of environment

Source: Authors' own research contribution.

Technological value is representing a specific value that differentiates it from other cultural goods (Merciu, 2024). It is evaluated by referring to technological exclusivity, technological innovation (Claver et al., 2018), etc.

Historical value is analyzed based on historical information of industrial monuments (Liu et al., 2024) and their association with historical events and personalities (Liu et al., 2024; Merciu et al., 2022).

Architectural/ artistic value includes remarkable architectural styles, aesthetic of industrial buildings, groups of buildings, overall factory structure (Liu et al., 2024; Claver et al., 2018; Merciu et al., 2022).

Cultural value is assessed by representativeness and symbolism of regional characteristic culture, representativeness and typology of industrial culture.

Social value is evaluated from the perspective of collective memory, the role of the industrial monuments in the life of the community, the impact it had on social or economic development (Claver et al., 2018; Liu et al., 2024; Meng et al., 2023).

The evaluation of economic criterion is based on the economic value of the heritage itself and its resources, the contribution of the reuse project (economic attractiveness and vitality of the industrial site) (Nocca et al., 2024; Meng et al., 2023).

The importance of the indicators was compared in pairs belonging to a certain criterion. They were evaluated according to the Saaty scale, a scale from 1 to 9, where 1 indicates the same level of importance between two indicators and 9 the most important (Claver et al., 2018; Liu et al., 2024; Della Spina et al., 2023). The evaluation of the importance of the indices was carried out by 5 external experts to increase the degree of objectivity of the evaluation.

Results and discussions

The paper investigates the adaptive reuse of two old industrial sites in Bucharest that housed activities in the electricity and flour industries.

The first industrial heritage site is Assan's Mill, which marked the beginning of Romanian industrialization, being one of the few witnesses still preserved regarding the evolution of the capital city. It was built in 1853 by of the industrialist Gheorghe Assan and the merchant Ioan Martinovici who thought of developing milling on an industrial scale based on the existing technology at that time. Assan's Mill was a grain grinding unit that operated on a Siegel steam engine (7,000 kg.) purchased by Assan from Vienna, along with the installation necessary to run the mill. Over time, new buildings were added: a new grain silo (1903) which was the tallest building in the city (41 m) at that time, a new varnish and paint section, warehouses (Iamandescu,

2008). The industrial site has a special architectural value, being built of brick in the French neoclassical style (the oldest buildings: mill and silo). The oldest buildings present an advanced decay been affected by two fires in recent years: they no longer have a roof and are directly exposed to climatic factors that contribute to their degradation (Figure 1, table 2).



Figure 1. Assan's Mill ensemble today

Source: Merciu G.-L.

The oldest municipal electric plant in Bucharest and one of the leading plants at the European level is the second case study. In 1906 the town hall concessioned gas and electricity lighting to the Gas and Electricity Company. The Filaret power plant was built between 1907-1908 according to the plans of engineer Alin Lonay by the Gas and Electricity Company in collaboration with the Société du Gaz pour la France et l'Etrangère (Iamandescu, 2010). The Filaret plant is a remarkable building of French-influenced industrial architecture, executed in apparent brick, with metal elements (Figure 2, table 2).



Figure 2. Former Filaret Electric Plant today

Source: Merciu F.-C.

The main building consists of the original body perpendicular to Candiano Popescu Street and an attached one parallel to the street. Both bodies have an attached tower (originally used as a water tank) as well as a body below, attached, with ancillary functions. The drawbridge in the main hall is kept. The high level of natural lighting in the hallways is noteworthy (Iamandescu, 2010).

The two old industrial ensembles are located in the pericentral area of Bucharest, having a good accessibility.

Table 2. Criteria and indicators selected for the evaluation of heritage values and their interpretation

Criterion	Indicators	<i>Assan's Mill – value interpretation</i>	<i>Former Filaret electric plant – value interpretation</i>
Technological value (A)	Technological exclusivity (A1) Technological innovation (A2)	an engine exhibited in "Dimitrie Leonida" National Technical Museum	One of the original Carels Frères engines is preserved in National Technical Museum
Historical value (B)	Identifying historical information (B1) Historical events or historical personalities (B2)	1856 George Assan one of the most important Romanian industrialists	1907-1908
Architectural /artistic value (C)	Architectural or artistic style (C1) Structure (C2) Artistic characteristics of heritage ad integrity of information preservation (C3)	Industrial architecture of French influence Brick structure advanced stage of decay	Classic French style Basilica type section with structure brick load-bearing metal frame and exterior in apparent brick; precarious state of preservation
Cultural value (D)	Representativeness and symbolism of Regional Characteristic culture (D1) Representativeness and Typology (D2)	Monument of reference both for the architectural quality and technical equipment at the time of construction Historical monument of national importance The first steam mill used in the flour industry	Historical monument of national importance The first electric plant in Bucharest
Social value (F)	Relevance of social life (F1) Collective memory attribute (F2)	Buildings are not safe to host cultural activities Called "Obor's Fire Mill" or "Assan's Ship" by community due to its production capacity (7 wagons of wheat in 24 hours) and the large area of the site	it has hosted various cultural activities and the Bucharest 2024 Annual Architecture Gala
Economic value (E)	Economic value of heritage and its environmental resources (E1)	Location in an area with high accessibility No any forms of pollution	Location in an area with high accessibility No any forms of pollution

Source: Authors' own research contribution.

The authors applied a qualitative evaluation for ranking of heritage values, which was carried out by experts in the preservation of industrial heritage and urban planning. Although the technological value is an important criterion, the two industrial complexes no longer keep valuable equipment inside them. The experts indicated that the historical and architectural values as having the greatest importance, followed by the social value. The historical value is correlated with the age of the industrial monuments. The architectural value is considered high as a result of the

aesthetics of the buildings, the outstanding artistic elements. The social value was evaluated from the perspective of the temporary use of the two industrial monuments in the current period. Assan's Mill is in an advanced state of decay and is not used to host socio-cultural activities; as a result, the experts gave lower scores (table 3).

Table 3. Raking of indicators for Assan's Mill

Criterion	Indicators	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5
Technological value (A)	A1	2	3	2	2	3
	A2					
Historical value (B)	B1	1	1	1	1	1
	B2					
Architectural /artistic value (C)	C1	9	9	9	9	9
	C2					
	C3					
Cultural value (D)	D1	1	1	1	1	1
	D2					
Social value (F)	F1	7	8	8	7	7
	F2					
Economic value (E)	E1	9	9	9	9	9

Source: Authors' own research results.

The Filaret electrical plant has hosted cultural activities or events in the field of architecture in recent years (table 4).

The experts considered that both industrial sites have a high economic value as a result of the historical and architectural values, as well as their positioning in the pericentral area of the city. Also, the flexibility of the buildings to be reused is correlated with the lack of industrial installations.

Table 4. Raking of indicators for Filaret Electric Plant

Criterion	Indicators	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5
Technological value (A)	A1	3	3	2	2	2
	A2					
Historical value (B)	B1	1	1	1	1	1
	B2					
Architectural /artistic value (C)	C1	9	9	9	9	9
	C2					
	C3					
Cultural value (D)	D1	1	1	1	1	1
	D2					
Social value (F)	F1	9	8	8	9	9
	F2					
Economic value (E)	E1	9	8	9	9	8

Source: Authors' own research results.

Based on the multi-criteria assessment of the heritage values of the two case studies and their ranking by the experts, the authors made proposals regarding their adaptive reuse.

Regarding Assan's Mill, its large area (40,000 m²) and the presence of nine buildings with varied morphology justify the proposal to be reused in a mixed manner that optimally utilizes each building. The oldest brick buildings (mill, silo) that do not allow an intervention on the structure

and internal compartmentalization could be arranged as a cultural center. It is proposed to set up spaces for hosting cultural activities (exhibitions, concerts), educational, creative workshops, a technical museum. This proposal is also justified by the fact that there is no cultural center in Obor-Lizeanu area where the mill is located. The proposal for reuse as a cultural center highlights the historical and architectural importance of the ensemble. The concrete structure buildings can be reused as office spaces for creative industries and a research center focused on studying industrial heritage. The generous space of the courtyard requires landscaping with elements of vegetation and the layout of pedestrian alleys.

Taking into account the previous function of the Filaret Electric Plant, its aesthetics, and its location behind "Dimitrie Leonida" National Technical Museum, the authors propose its transformation into a museum exhibition hall. Currently, numerous museum exhibits were stored in the courtyard due to the lack of space inside the cultural institution. The elongated shape of the former plant recommends it as a suitable space for the display of various pieces of technical equipment under the administration of the Technical Museum.

The evaluation process allowed the identification of the factors that determined a small number of abandoned industrial monuments in Bucharest included in adaptive reuse projects. The absence of previous experience in the field of conservation and valorization of Romanian industrial monuments before the early 1990s was followed by dramatic discontinuity of industrial activity. In Romania, there is an institutional protection system outrun by the dynamics of several factors (tertiarization, high demand for new homes), to which is added the underfunding of culture domain (low budget for restoration of heritage buildings). However, the allocation of a reduced budget for culture is compensated by the access to European funds for the restoration of historical monuments through the RO Cultura program in recent years.

Della Spina et al. (2023) also consider the property situation of industrial monuments as an important factor that can influence the way of reuse. Many Romanian industrial monuments are privately owned (Peptenatu et al., 2012), a fact that limits the number of restorations and adaptive reuses due to the high cost of regeneration projects. Most of the time, as in the case of Assan's Mill, the owner leaves the industrial site abandoned, and actions of intentional destruction (theft of bricks, arson) are also started (Iamandescu, 2010), so that over time it deteriorates.

Based on the analysis of the factors that influence the reuse of industrial monuments at the national level, we can appreciate the confirmation of the first hypothesis of the study according to which there is a negative correlation between the high costs and the dynamics of projects for the reuse of industrial monuments. This aspect was also highlighted in the studies carried out in other countries (Meng et al. 2023; Della Spina et al., 2023). The high costs of adaptive reuse projects of industrial monuments are determined by the need to restore them as a result of the fact that they have a deteriorated structure. The large area of some industrial heritage sites can represent a barrier in starting adaptive reuse projects (Claver et al., 2018) and generate a higher final cost (Han Han, Zhang, 2022; Meng et al., 2023; Nocca et al., 2023; Della Spina et al., 2023). For example, Assan's Mill has a large area and requires the restoration of old buildings. This fact validates the third hypothesis of the study.

The analysis of industrial monuments' transformation highlights that most projects are started in the peri-central area of Bucharest due to the high accessibility (e.g., the former Commodity Exchange, located 10 minutes away from the civic center of Bucharest, was reused as office space for creative industries and as exhibition space). This fact validates the second hypothesis of the study. In different countries, projects of adaptive reuse of industrial monuments

have been started in strategic locations of cities (Liu et al., 2024; Meng et al. 2023; Nocca et al., 2024; Della Spina et al., 2023).

Adaptive reuse is focused on the conservation of industrial monuments that ensures the preservation of patrimonial values and their life cycle extension stimulating the development of economic and/or cultural activities (Claver et al., 2018; Liu et al., 2023; Della Spina et al., 2023). It is noted that investment decisions for the adaptive reuse of industrial heritage are complex, as a result of the large number of stakeholders involved (owners, decision-makers, investors). More authors emphasized that adaptive reuse practice of industrial monuments should be based on the interaction and negotiation of stakeholders (Nocca et al., 2024; Oevermann, 2015; Della Spina et al., 2023). Citizens represent an important stakeholder who should be consulted in making decisions regarding the reuse of heritage buildings (Liu et al., 2023; Merciu et al., 2022; Della Spina et al., 2023). This action would contribute to strengthening community ties, social cohesion and a sense of community belonging to industrial monuments.

Conclusion

This paper offers an evaluation framework focused on multi-criteria analysis, able to support the optimization of the reuse of two abandoned industrial heritage sites in Bucharest with the aim of evaluating in depth their patrimonial values for establish their reuse for the needs of local community. The importance of the study is reflected by the analysis of a category of cultural heritage that is currently in a shadow cone in Romania.

The added value of the paper is conferred by proposals of adaptive reuse of two nationally representative industrial heritage sites, contributing to the implementation of circular economy principles in the case of reuse of heritage buildings. The proposals made by the authors are thought as strategic solutions in the capital city characterized by accelerated dynamic that generates a negative impact on heritage buildings. In addition, the selection of the multi-criteria method allows its replication in other large cities nationwide that have valuable non-functional industrial heritage assets. From practical point of view, the authors used a suitable method for determining reuse potentialities of industrial monuments based on a more objective assessment and providing specific guidance to decision makers. The paper is constituted as a communication tool of complex business solutions for potential investors.

A limitation of this study is that it focused on the decision aid approach of reusing only two industrial heritage sites. Another limitation is that community perception was not included in the study. In the future research, the community's participation in the process of adaptive reuse of a larger number of industrial monuments will be pursued, in order to identify the possible scenarios of their optimal reuse.

References

- Busu, C., Busu, M. (2018). The circular economy model. Case of Romania. *Proceedings of the 12th International Management Conference: Management Perspectives in the Digital*, 554-564.
- Claver, J., García-Domínguez, & Sebastián, M.A. (2018). Decision-making methodologies for reuse of industrial assets. *Hindawi Complexity*, 1-18, 4070496.
- Dascălu, V.-G.; Grecu, A.; Gruia, A.K.; Mihăilă, V.; & Drăghici, C.C. (2024). The role of road accessibility for tourists in the valorization of archaeological resources in the Dobrogea Region, Romania. *Sustainability*, 16, 10576.

- Gravagnuolo, A., Angrisano, M., Bosone M., Buglione, F. De Toro, P., & Girard L.F. (2024), Participatory evaluation of cultural heritage adaptive reuse interventions in the circular economy perspective: a case study of historic buildings in Salerno (Italy). *Journal of Urban Management*, 13, 107-139.
- Han Han, S., & Zhang, H. (2022). Progress and prospects in industrial heritage reconstruction and reuse research during the past five years: review and outlook. *Land*, 11(12), 2119.
- Iamandescu, I. (2008). *Fire at Assan's Mill*, Retrieved from: <https://arheologie-industriala.blogspot.com/2008/>
- Iamandescu, I. (2010). *Filaret electric Plant industrial architectural heritage file*, EEA Grants, Retrieved from https://www.academia.edu/31117166/Bucuresti_uzina_electrica_filaret.
- Liu, F., Qiang, W., Yang, Y., Song, Z. (2024). Evaluation of silk industrial heritage value based on IAHP, D-S theory and mixed decision model: the case of Hangzhou-Jiaxing-Huzhou in China. *Journal of Asian Architecture and Building Engineering*. DOI 10.1080/13467581.2024.2396605.
- Nocca, F., Bosone, M., & Orabona, M. (2024). Multicriteria evaluation framework for industrial heritage adaptive reuse: the role of 'intrinsic value'. *Land*, 13, 1266.
- Meng, F., Zhi, Y., & Pang, Y. (2023). Assessment of the adaptive reuse potentiality of industrial heritage based on improved entropy TOPSIS method from the perspective of urban regeneration. *Sustainability*, 15, 7735.
- Merciu, F.-C., Petrișor, A.-I., Merciu, G.L. (2021). Economic valuation of cultural heritage using the Travel Cost Method: The historical centre of the Municipality of Bucharest as a case study. *Heritage*, 4, 2356–2376.
- Merciu, F.-C., Păunescu, C., Dorobanțu, M., & Merciu, G.L. (2022). Assessing the value of railway heritage for sustainable development: the case study of the Oravița-Anina railway, Romania. *Sustainability*, 14(20), 13262.
- Merciu, F.-C. (2024). Introduction: the complexity of industrial heritage versus a multifaceted approach. In Merciu F.-C. (ed.), *Industrial heritage a multifaceted approach*, pp. 11-45. Bucharest: Universitară Publishing House.
- Oevermann, H. (2020). Good practice for industrial heritage sites: systematization, indicators, and case. *Journal of Cultural Heritage Management Sustainable Development*, 10 (2), 157-171.
- Peptenatu, D.; Drăghici, C.; Merciu, C. (2012). Characteristics of entrepreneurial profile in some emergent territorial structures in Romania. *Actual Probl. Econ.* 12, 448–458.
- Della Spina, L., Carbonara, S., Stefano, D. & Viglianisi, A. (2023). Circular evaluation for ranking adaptive reuse strategies for abandoned industrial heritage in vulnerable contexts. *Buildings*, 13, 458.