

INTEGRATION OF THE SECAP METHOD IN SUSTAINABLE BROWNFIELD REHABILITATION PLANNING

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Brownfield rehabilitations provide a unique opportunity to contribute to local sustainable development, whereby the sustainability of those projects is also considered from the beginning of the planning process. This implies a specific focus on sustainable development throughout the project lifecycle, and it is crucial to rehabilitate these fields by proactively addressing climate challenges and contributing to the evolution of low or zero-emission districts. In the current paper, the European policy, legal framework, Hungarian legislation, and strategy documents define the sustainability aspects and requirements were analysed. Comprehensive terminology was developed, considering existing methodologies with a particular focus on the Social, Environmental and Climate Assessment Procedures (SECAP).

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1 Introduction

Sustainable development is a core principle of the European Union that merges economic, social and ecological aspects into one paradigm. Land use in a given geographic area is both the cause and the outcome of economic development and reflects the human impacts on the environment. For this reason, land use changes are critical for sustainable development, and the topic is crucial to the EU's policy agenda. The target of no net land taken by 2050 is part of the European Union's 7th Environmental Action Program (European Parliament and Council, 2013) and was also reinforced by the European Union's Soil Strategy for 2030 (European Commission, 2021). Encouraging the redevelopment of brownfields is particularly important to emphasize as an efficient approach to sustainable land use and land use planning, as well as a crucial mechanism for minimizing the loss of fertile land and mitigating land use. This requires a comprehensive approach involving various prerequisites, consisting of legal, financial, regulatory, and community-based considerations. The current article focuses on the legal and regulatory framework. It discusses how it creates a favourable environment for unlocking the potential of underutilized sites. It aims to propose a new model to fill the missing gap of integrating Sustainable Energy and Climate Action Plan (SECAP) and the Sustainable Urban Mobility Plan (SUMP) as essential tools for brownfield project planning.

2 Theoretical background / literature review

Originating in North America, the term "brownfield" quickly gained widespread recognition across the globe, particularly in Europe. The European Commission has explicitly stimulated the use of the term by organising a thematic conference in 2019 to promote brownfield redevelopment as a solution to limit urban sprawl, land take and soil sealing. Nonetheless, the EU needs a standard definition of brownfields and has a common general brownfield policy or strategy (Jacek et al., 2022). There is no single common methodology to define site-specific remediation standards or support the planning and implementation of brownfield rehabilitation (Morar et al., 2021). Thus, to understand the EU's ambitions concerning brownfield rehabilitation, EU policies that consider the direct and indirect impact of land use are to be examined. Regarding the Hungarian national legislative framework, the Building Act (Act LXIV of 2019) establishes the regulative framework for brownfield sites. The

most relevant articles are 2 § 43, which provides the definition of brownfield sites, and 8 § (7), which consigns the municipalities with the planning task concerning the rehabilitation projects. There are no standard tools for planning brownfield rehabilitation projects on the European or national level. Highlighting the sustainability aspects, the Sustainable Urban Mobility Plan (SUMP) and the Social, Environmental and Climate Assessment Procedures (SECAP) are relevant methodologies to be considered.

3 Methodology

The current study is based on a threefold analysis process. The relevant EU policy framework is identified as the first phase, and respective policy instruments are screened. In the second phase, Hungary's legislative implementation framework is discussed. In the third phase, selected available methodologies are examined and compared, and a systemic management structure is developed to illustrate how SECAP can be exploited during brownfield rehabilitation.

3.1 EU legislative framework

The EU policy framework analysis includes general and sectoral policy documents to screen for how well they steer and facilitate the redevelopment of the industrial landscape. In sum, 18 relevant EU policies have been identified (see Table 1).

3.2 Hungarian National Framework

The most relevant and actual legal document is the Building Act LXIV of 2019, an amendment of the original Building Act LXXVIII of 1997. It establishes the basic rules for brownfield sites. Also, it requires that, if there is a brownfield area in the administrative territory of a municipality, the local government is obliged to define the brownfield in the settlement planning tools (e.g., master plan, land use plan, and zoning plan) (Szakonyi & Makó, 2023).

3.3 Methods for sustainability planning

As no planning tools and methodologies concerning brownfield rehabilitation exist on a European level, the focus is set on planning instruments comprehensively serving sustainable development: the SUMP and the SECAP. These instruments are predefined by the European Union and implemented in the Member States on a local/national level, ensuring that development pathways in the European Community's different territories are similar to how SUMP and SECAP influence the brownfield rehabilitation planning and will put them into one systemic model with another planning document to ensure high efficiency of brownfield projects.

4 Results

Each research phase has generated its research outcomes that can be summarized as follows:

4.1 EU legislative framework

The text analysis of the 18 policy documents showed that only four explicitly mention brownfield rehabilitation. As summarized in Table 1, 11 further documents refer to connected terms like urban development, sustainable land use, reusing urban soil, and mitigating urban sprawl.

Research showed that the documents need to include criteria for sustainability or specific definitions of sustainable urban development and sustainable land use/management. The explanation might be that until now, sustainable development has been considered a general imperative in the European Community that has yet to require any further clarification or explanation.

Table 1: Categorization of reviewed policy documents

Observation	Policy documents
Mentions explicitly brownfield	<ul style="list-style-type: none"> – A new Circular Economy Action Plan (European Commission, 2020a) – EU Biodiversity Strategy for 2030 (European Commission, 2020d) – 7th EU Environment Action Programme (European Parliament, European Council, 2013) – Regulation on the Just Transition Fund (European Parliament, European Council, 2021a)
Has a clear reference to connected terminology (e.g. urban development, sustainable use of land, rehabilitation, restoration, regeneration, reusing urban soil)	<ul style="list-style-type: none"> – Roadmap to a Resource Efficient Europe (European Commission, 2011) – Reflection Paper - Towards a Sustainable Europe by 2030 (European Commission, 2019a) – The European Green Deal (European Commission, 2019b) – A Renovation Wave for Europe (European Commission, 2020c) – The New Leipzig Charter (2020) – EU Soil Strategy for 2030 (European Commission, 2021a) – New EU Strategy on Adaptation to Climate Change (European Commission, 2021b) – Regulation on the European Regional Development Fund and on the Cohesion Fund (European Parliament, European Council, 2021b) – Interreg Regulation (European Parliament, European Council, 2021c) – Territorial Agenda 2030 (2020) – Urban Agenda for the EU, Pact of Amsterdam (2016)
No relevant topic reference	<ul style="list-style-type: none"> – A New Industrial Strategy for Europe (European Commission, 2020b) – European Climate Law (European Parliament, European Council, 2021d)

4.2 Hungarian National Framework

The national legal framework has an apparent definition of brownfield. 2 § 43 of the Building Act defines a brownfield site as a parcel or parcels of land that has been abandoned, underutilized, or degraded, typically polluted, following primarily industrial commercial, transport or defence uses, but which can be converted into an area of value-added development through environmental and technical intervention. 8 § (7) consigns the municipalities the planning task concerning the rehabilitation projects, stating that the local government may delimit the brownfield areas in the settlement spatial plan and determine their reuse and development

possibilities while revising the settlement development plan. Thus, the national law defines that the local government must redevelop brownfield sites on its territory. In addition, the Building Act also names the local planning instruments that must deal with the brownfield development. The settlement management plan and the settlement development plan together create the settlement master plan, as defined by the Act XXXIX of 2021, and integrate the previously used tools like the settlement development concepts and strategies, settlement structure plans, local building regulations and the detailed zoning plans, in one joint land use planning instrument on local level (Jámbor et al., 2021). Brownfield areas are thus defined in this local settlement master plan, which includes analysis, recommendations, and proposals for the site's population, economy, housing, transportation, community facilities, and land use. It defines the brownfield redevelopment's construction concept and includes the zoning plan with detailed rules on how to use the brownfield area. The building code of the zoning plan specifies the standards for constructed objects, such as buildings on the brownfield, focusing on the building's physical features and characteristics that affect accessibility and safety (Szakonyi & Makó, 2023).

4.3 Methods for sustainability planning

SUMP and SECAP focus on a critical aspect of sustainable development (mobility and transport vs. energy and climate change mitigation, respectively) that directly impacts brownfield rehabilitation. SUMP is a strategic blueprint crafted to meet the transportation requirements of residents and businesses within urban areas and their adjacent regions, aiming to enhance overall quality of life. As Szakonyi and Makó (2023) highlighted, SUMP places people and their mobility at the heart of the planning efforts – contrary to traditional transport planning that has focused on providing space for the development of car traffic. Thus, SUMP supports public transport, walking, and cycling while reducing car use in this sense; it fosters, for example, car-free areas or zero-emission zones. The outcomes are of utmost importance for brownfield rehabilitation, as transport capacities directly impact the feasibility of such projects. SECAP focuses on energy security and climate change mitigation. It draws on the Baseline Emission Inventory (BEI) findings and the Climate Change Risk and Vulnerability Assessment (RVA). It defines concrete climate mitigation and adaptation measures with timeframes and assigned responsibilities, translating the long-term strategy into action (Bertoldi, 2018). A new

model for brownfield development planning was created in 2022 by Szakonyi and Makó (2023) to increase its sustainability outcomes by incorporating a transportation impact assessment as part of the settlement master plan. SUMP also appeared earlier in this new model, following the master plan and feasibility studies to improve the project evaluation process. Similarly, SECAP should also be integrated into the planning and evaluation process to consider renewable energy potentials in the brownfield planning mechanism. That can result in dedicated repurposing of the site, enabling the conversion of an area into a renewable energy valley or incorporating renewable energies into the brownfield project (Figure 1).

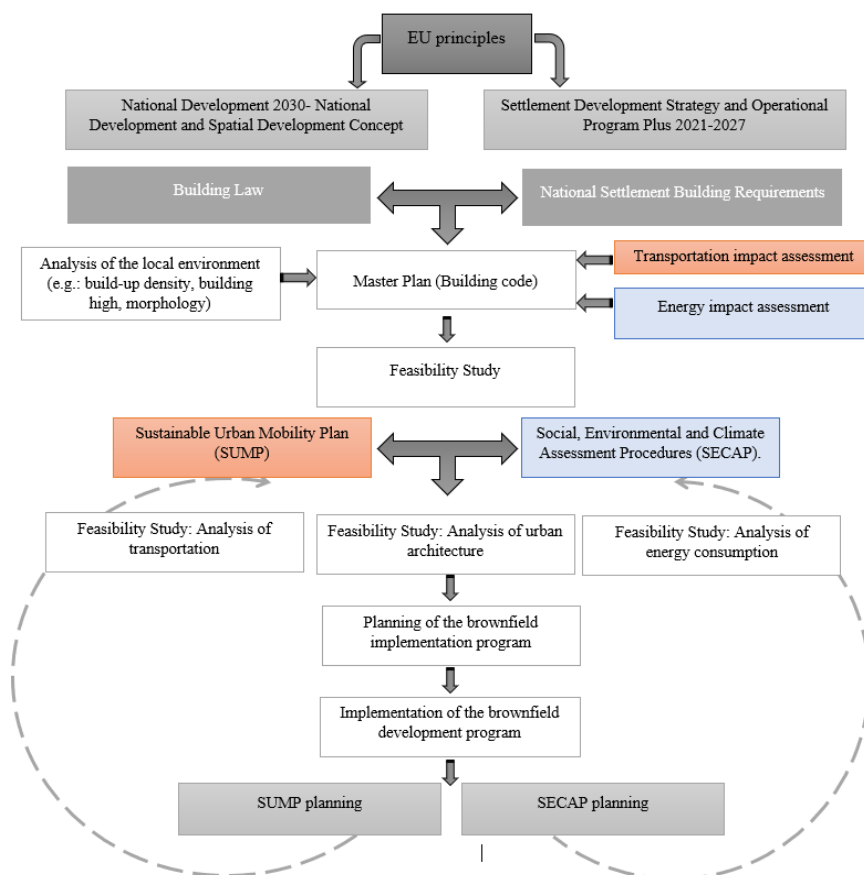


Figure 1: The proposed systemic model integrates the SECAP into the brownfield project evaluation process

5 Discussion

As summarized in Table 2, both SUMP and SECAP are planning instruments for cities that encourage joined-up decision-making across sectors and between stakeholders, focus on actual current and predictable future data (D, L, M) and emphasize the importance of vision and implementation (E, P, R). Both documents underline the importance of integrated approaches. SECAP explicitly strives for its integration into the municipality's everyday management processes (F, O). Further, SUMP highlights the relevance of quality management (G, H), while SECAP points to financial and human resources (K, Q). To develop a systemic management model, it is also essential to integrate not only the content-relevant inputs, thus the thematically relevant elements of SUMP and SECAP into the brownfield planning and implementation process but also the use the critical methodical elements of the two planning instruments in an integrative way.

Table 2: Methodical principles and elements of SUMP and SECAP

SUMP Driving principles	SECAP key elements
A. Plan for sustainable mobility in the “functional urban area”	I. Build support from stakeholders and citizen participation: if they support the SECAP, nothing should stop it!
B. Cooperate across institutional boundaries	J. Secure a long-term political commitment
C. Involve citizens and stakeholders	K. Ensure adequate financial resources
D. Assess current and future performance	L. Do a proper GHG emissions inventory as this is vital
E. Define a long-term vision and a clear implementation plan	M. Make a Climate Change RVA, based on an analysis of the local/regional trends of various climate variables and city socioeconomic and biophysical specificities
F. Develop all transport modes in an integrated manner	O. Integrate the SECAP into everyday management processes of the municipality: it should not be just another nice document, but part of the corporate culture!
G. Arrange for monitoring and evaluation	P. Ensure proper management during implementation
H. Assure quality	Q. Make sure that staff has adequate skills, and if necessary, offer training
	R. Learn to devise and implement projects over the long term

Based on Bertoldi (2018) and Rupperecht (2019)

Figure 2 illustrates the systemic management model for brownfield rehabilitation and leads to the following methodical recommendations to be considered:

- The social consultation and stakeholder engagement processes launched for SUMP and SECAP can create the base to ensure commitment and social acceptance for the envisaged brownfield project.
- A combination of classic project management tools and agile management techniques might ensure the focus on long-term vision while carrying out comprehensive operative implementation.
- An integrative approach should be used for thematic definition and for methodical implementation of the brownfield project to allow already established structures and frameworks to be built up and widened according to the specifics of the brownfield site.
- Quality management should focus on quality planning, assurance, and control, whereby the structures defined by SUMP can be reused and built upon.
- Adequate planning, allocation, and use of financial and human resources within SECAP can create an implementation framework that can also be utilized for the brownfield project.

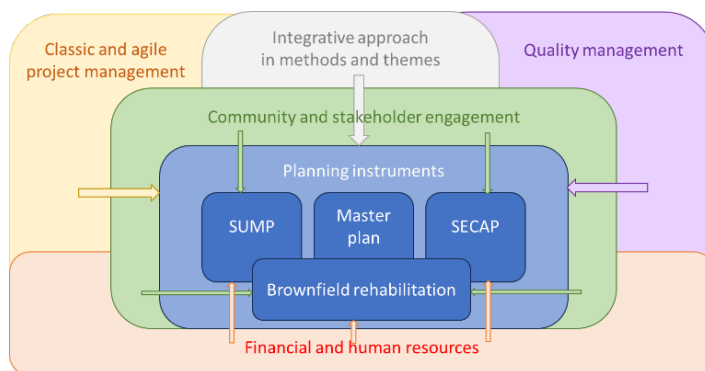


Figure 2: Systemic management model for brownfield rehabilitation Figure

6 Conclusions

Relevant policy documents on the EU level refer to brownfield rehabilitation indirectly or promise future strategy development. The terminology and implementation framework on a national level in Hungary do exist. However, neither the EU nor the Hungarian legal and policy framework indicates how the sustainability impacts of brownfield rehabilitation should be planned, measured or

exploited. SUMP and SECAP co-exist with the national land use planning instruments, but clear correlations could not be detected. The suggested new brownfield project development model, which integrates SUMP and SECAP into the process, seems promising. In contrast, the proposed systemic management model explores the methodical elements and structures used for SUMP and SECAP development, which can be explored for brownfield project planning and implementation.

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