

# **Procesul regenerării siturilor de tip brownfield – un obiectiv cheie în dezvoltarea urbană durabilă (1) / Brownfield regeneration process – a key objective for a sustainable urban development (1)**

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**Abstract.** Brownfield regeneration, involving the reintegration of derelict and abandoned sites into their economic environments, is a key element of sustainable urban development and tackles environmental, social, economic and cultural issues, which are the main aspects of sustainability. Most Eastern and Central European cities, mainly because of their history and the features of transition to a market-led economy, carry an exceptionally large burden of under-used and brownfield land. This land represents a hole in the urban fabric, with significant losses in economic efficiency, social cohesion and quality of life. At the same time, new development on agricultural land that could have been located on recycled brownfield land is contributing to urban sprawl. This further reduces the city and community economic performance and competitiveness. Given this context, I have decided to come up with an article that deals with the brownfield issue, explaining the necessity of implementing successful strategies for the brownfield regeneration process at European level, the factors that contribute to such successful stories, as well as the steps and the barriers towards a sustainable urban development from the perspective of its 4 dimensions: economic, social and cultural, environmental and institutional.

**Key words:** brownfield, development, sustainability, regeneration, space planning.

## **1. Introduction**

Deindustrialization has resulted in the creation of “Brownfield Sites” throughout all the traditional industrial regions of Europe. The significance of the brownfield issue is well understood at the European level. Their adverse socioeconomic impacts have brought brownfields high on the radar of European Union regional development, environmental protection and urban initiatives<sup>1</sup>. The reduction of the agricultural land transformation rate into urban uses and protection of agricultural lands as resources for future food production and environmental sustainability became the European Commission objectives. Regenerating derelict and underused sites and devoting them to inner urban development might be a major way to limit pressure on valuable greenfield sites around cities<sup>2</sup>. Brownfield regeneration, involving the reintegration of derelict and abandoned sites into their economic environments, is a key element of sustainable urban development and tackles environmental, social, economic and cultural issues, which are the main aspects of sustainability. To realize the full potential brownfield regeneration offers to sustainable urban development, the parameters that influence the degree of sustainability within brownfield regeneration itself have to be understood.

While many European directives come from a technical environmental protection and control background, addressing relevant brownfield aspects separately, a shift can be observed in European brownfield policies to simultaneously address environmental protection and spatial planning issues. Brownfield sites are not solely discussed in technical

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<sup>1</sup> Franz, M., Pahlen, G., Nathanail, P., Okuniek, N., and Koj A. 2006

<sup>2</sup> Siebielec, G. Rabl-Berger, S., Bluemlein, P., Schweiker, M., Huber, S., I. Wieshofer, I., Biasiol, M, Ajmone Marsan, F., Medved, P., Sobocka, J., Galuskova, I., Vokurkova, P. 2012

terms anymore, but as an opportunity for saving resources and delivering sustainable urban development. Such integrated thinking reflects the complexity of brownfield regeneration, and its social, environmental, economic and institutional implications<sup>3</sup>.

In Romania, the term “Brownfield” is obviously misunderstood. The statistics show that in 2000, the country had one of the largest brownfield territories in Europe. The problem was that the Romanian government listed all brownfield areas as contaminated by pollution, despite the fact that these areas were yet economically active. Under the communist regime, Romania underwent a strong industrialization, and after the political change the industry (especially the heavy one) started its collapse and, as a consequence, many of the industrial buildings were decommissioned and left unused to their full potential, thus contamination occurring over time.

Nowadays, as the national priorities are also changing, Romania has to align itself with the environmental and spatial planning policies of the European Union, and in order to achieve this goal, it imports them from countries that strive for sustainable brownfield regeneration. Countries with comparable strong spatial planning institutions such as Austria, the Czech Republic, Italy, Poland, Slovakia or Germany have created and developed specific instruments in order to identify the best practice for sustainable brownfield regeneration by carrying out studies in industrial core regions of their territories in which they analyzed the current practices and derived improvement for the applied procedures. The result was a sustainability assessment tool – SAT, which does not stand alone, but is based on an elaborate framework of objectives, indicators, best practices and tools that reflect the multidimensional and multi-stakeholder complexity that characterizes sustainable brownfield regeneration<sup>4</sup>. Other efforts to address environmental and spatial planning issues simultaneously and develop an integrated approach have also resulted in a shift in attention of policy makers from the assessment of problems to the formulation of solutions that will meet the needs of society in a sustainable way, e.g., the CLARINET approach, the CircUse strategy.

Given this context, I have decided to come up with a research that deals with the brownfield issue, explaining the necessity of implementing successful strategies for the brownfield regeneration process at European level, the factors that contribute to such successful stories, as well as the steps and the barriers towards a sustainable urban development from the perspective of its 4 dimensions: economic, social and cultural, environmental and institutional. My intention is to deal with different approaches of the brownfield regeneration process in terms of spatial planning, in different countries, taking also into consideration my experience in the real estate field, both in Romania and Austria.

## **2. Exploring brownfields as a spatial phenomenon. Definition and theoretical background**

### *2.1. Historical background to Eastern and Central European Countries*

Most Eastern and Central European cities, mainly because of their history and the features of transition to a market-led economy, carry an exceptionally large burden of under-used and brownfield land. This land represents a “hole” in the urban fabric, with significant losses

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<sup>3</sup> Franz, M., Pahlen, G., Nathanail, P., Okuniek, N., and Koj A. 2006

<sup>4</sup> Franz, M., Pahlen, G., Nathanail, P., Okuniek, N., and Koj A. 2006

in economic efficiency, social cohesion and quality of life<sup>5</sup>. At the same time, new development on agricultural land that could have been located on recycled brownfield land is contributing to urban sprawl. This further reduces the city and community economic performance and competitiveness. However, many urban brownfields can be put to new and often exiting uses. This is why the brownfields not only represent a threat to their communities but also represent a challenge. Competitively performing cities and regions are at the forefront of the urban agenda of all developed nations and these are the standards that our cities have to maintain to remain competitive.

The shared socialist heritage of Central European cities has shaped a similar set of brownfield patterns and responses. With no real estate or capital markets to speak of, state companies did not consider the cost of land or of money when making construction or operating decisions. Raw goods allocation and production was regulated by plans and quotas. Inflexibility and bad predictions about demand and supply led to the setting aside of large areas for the storage of raw materials and finished products often for extended periods. Companies were not responsive to the spatial and financial inefficiencies of these build-ups and their premises were often much larger than their counterparts in capitalist economies and sometimes over-equipped.

Thus, central European cities (even those that are not heavily industrialised) have two to three times the amount of space devoted to current or past industrial uses than their western counterparts. The portion of land devoted to industrial uses is even higher in industrial cities, and this faces massive brownfield and restructuring problems with the demise of their indigenous industries. The development of these cities over time under socialist planning added another feature to Eastern and Central European Countries brownfield location. Massive high-rise housing estates were developed beyond the industrial sites, (often to house workers in these industries), so the expansion of cities made it common for large industrial sites to occupy quite central and valuable land.

The relevance of brownfield matters was accelerated by the integration of the Central and Eastern European states into the EU. In these countries, the social and system changed with the 1990s installed democracy and market economy, but they also made necessary a fast adaptation of their governance formats, as well as changes to their legal systems, amendments to their production or security patterns and the remodeling of many of their social processes and relationships. Furthermore, prior to their EU accession, these countries also had to absorb a large amount of EU directives into their legal frameworks, which were already in rapid evolution. For a number of questions covering the accession agenda, the candidate states received ample technical assistance from their EU peers. But there was no EU technical assistance concerning land use management, spatial planning or urban development skills, because these are all under direct national responsibility. And at that time, being busy with the accession process, these candidate states failed to address their national, regional and local urban development issues correctly.

The changes in society and economy, combined with an absence of land use management and planning and urban development skills, prevented these states, their regions and communities to be able to cope with the free market situation. One of the outcomes was a

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<sup>5</sup> Ferber, U., Nathanail, P., Bergatt Jackson, J., Krzywon, R., Drobiec, L., Petříková D., Finka M. 2006

vast amount of underused brownfield lands in the candidate states, emerged at the beginning of the third millennium. Meanwhile (especially in the fast-growing regions), greenfield developments have sprung in ever increasing number.

Upon joining the EU, these countries have been forced to compete on the same footing with much more sophisticated planning, land use and urban management processes of the 'older' EU member states. After the year 2000, the EU candidate states had access to the EU Instrument for Structural Policies for Pre-Accession (ISPA). But the ISPA funding priorities had no urban dimension, and therefore sustainable urban land use – such as the reuse of brownfields – could not easily receive EU funding support. Local support for brownfields reuse was then problematic as well. This was mainly because of the local knowledge gaps in the land use management skills and also due to the fact that brownfields as such were not a 'recognised' planning issue and so they were not presented as national/regional priorities in several national and EU development support programs.

In the new member states the lack of development know-how combined with governance principles of subsidiarity and uncoordinated local planning tasks rapidly worsened the sustainable use of land in many local communities. Often, local governments considered increases in urbanized land (not necessarily matched by population increases) as signs of local growth. This caused a large loss of agricultural, natural and forest land in favour of new building sites, produced unsustainable practices of urbanized land use and increased costs of development externalities. Such trends also reduced the local, regional and national competitiveness when these mounting costs of externalities entered the production cost chain. Today the loss of land environmental services due to such urbanization is still insufficiently valued or compensated, and land as public good is not being well protected at national and especially at regional level.

Nowadays, one of the biggest challenges in European urbanization is the redevelopment of the brownfield, as a solution to limit urban sprawl, land take and soil sealing. A brownfield redevelopment mostly occurs in regions that lack the greenfield areas, however, satisfying the demand for the urban land can be addressed without expanding into greenfield. The complexity of a brownfield redevelopment results from various physical, legal and financial issues underlining the involvement of numerous parties on various levels<sup>6</sup>. These most important parties are municipalities, landowners, end-users and end-investors.

Furthermore, there are additional actors involved. They either can be seen as sub-groups of already mentioned groups such as independent development companies, contractors or completely new groups with different goals such as designers, consultants, environmental groups and citizens. Urban development cannot proceed without commitment of these actors because the decision processes are interdependent. Therefore, one actor cannot determine the outcome of the development process<sup>7</sup>.

Several important changes have influenced the urban planning and redevelopment process in the last decade. At first, the scope and scale of urban redevelopment projects increased (Yount and Meyer, 1999). Secondly, a traditional linear planning process from the

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<sup>6</sup> Glumac, B. 2012

<sup>7</sup> Glumac, B. 2012

government to the building industries has been replaced by public-private collaborations. This has changed the characteristics of the developer and municipality. Their interactive involvement plays now the major influence in the urban development process<sup>8</sup>.

The service-oriented economy has led many companies increasingly decide to establish their business on industrial areas<sup>9</sup>. Consequently, the companies started redeveloping them. Any transformation has a significant risk related to the already mentioned complex actors' involvement and financial challenges due to the long redevelopment time and often high remediation costs, for example. Given only these two risks, brownfield sites within the cities are more likely to be transformed compared to those at the cities' outskirts<sup>10</sup>.

The location advantages are very well known since the introduction of the central place theory<sup>11</sup>. Obviously, these advantages apply to the brownfield sites as well. Although redevelopment projects have a higher risk compared to greenfield investments<sup>12</sup>, redeveloping a brownfield especially with the location advantages can create more value for involved actors<sup>13</sup>.

Further, the potential multi-actor interest can lead to the creation of a certain form of public-private partnership. Nonrelated to the form, the success of the redevelopment depends largely on the cooperation between these two parties. Especially important can be defining influences of a future land use that captures the supply and demand of a current property market situation<sup>14, 15, 16</sup>.

As mentioned, the location advantages can be an incentive for private parties but also there are other positive physical aspects of a site such as skyline, relief, soil properties, etc. Furthermore, besides the physical aspects also legal and financial aspects play a role in success of a brownfield redevelopment project. To make an inventory of the important attributes of a brownfield, a previous step would be defining a brownfield and explaining the existing classifications.

## 2.2. Definition of brownfield

Internationally, at the pan-European level, nationally and regionally, there are a number of alternative definitions of "Brownfield" land. Brownfield is a relatively new term and it may be defined as "any land or premises which has previously been used or developed and is not currently fully in use, although it may be partially occupied or utilized. It may also be vacant, derelict or contaminated. Therefore, a brownfield site is not available for immediate use without intervention<sup>17</sup>". This definition is also summarized by the CABERNET report<sup>18</sup>, which

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<sup>8</sup> Brail, R. K. 2008

<sup>9</sup> Pen, C. J. 2002

<sup>10</sup> Glumac, B. 2012

<sup>11</sup> Christaller, W. 1966

<sup>12</sup> De Sousa, C. A. 2002

<sup>13</sup> Liang, Y. H., Guo, P., and Hu, J. F. 2008

<sup>14</sup> Forester, J. 1987

<sup>15</sup> Martínez, F. J., and Henríquez, R. 2007

<sup>16</sup> Ritsema van Eck, J., and Koomen, E. 2008

<sup>17</sup> Alker, S., Joy, V., Roberts, P., and Smith, N. 2000

refers to brownfields as “sites that have been affected by the former uses of the site and surrounding land; are derelict and underused; may have real or perceived contamination problems; are mainly in developed urban areas; and require intervention to bring them back to beneficial use”.

It is interesting to compare this with the USEPA definition: “With certain legal exclusions and additions, the term ‘brownfield site’ means real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.” Whilst the USEPA definition appears to be exclusively based on contamination, the “legal exclusions and additions” referred to bring in other categories of land such as “scarred mine lands” and “railfields”. These are not automatically synonymous with contamination and bring the practical coverage of the USEPA brownfields definition much closer to that of the CABERNET definition.

In 2009, the term was defined for the first time by the Austrian Standards Institute in their standard ON S2093 “Survey and assessment of the environmental status of used surfaces for real estate evaluation” as follows: Brownfield (Brachfläche): “previously used site or part of a site, which is presently derelict or underused. Owing to the site characteristics (e.g. dedication, status of its opening up for development, location) it offers a potential for reuse. The period, for which the site has been derelict, is not relevant”.

REK 2007 (Räumliches Entwicklungskonzept – Local Development Scheme) of the City of Salzburg introduces the equivalent term “Umstrukturierungsflächen” (Restructuring Areas): “Derelict or underused areas, which could be generally used as land for building, but where the current dedication is in most cases no longer applicable (e.g. former caserns or traffic areas, which are no longer needed and which could be used for building)”.

The German term “Brachfläche,” variously translated as derelict land/site, vacant land/site, brownfield site, is not clearly defined and covers a broad field of meaning. Its origins are in agriculture, where “Brache” means “fallow (land)” land left uncultivated for a year to restore its fertility in the three-field crop rotation system. In urban studies and urban planning practice, “Brache” has been applied to abandoned or formerly developed land particularly since the 1970s, when economic and technical structural change led to the widespread abandonment of sites. In contrast to fallow land in agriculture, the derelict or vacant sites in this context are not deliberately taken out of the use cycle, but usually find no subsequent use<sup>19</sup>.

Definitions derived from the CABERNET definition are applied in a number of other European countries such as Slovakia or Czech Republic, whereas in Poland, brownfield areas are defined as “Degraded areas due to diffuse soil contamination – high density of landfill sites”<sup>20</sup> while Italy is putting together terms which are synonymous with contaminated areas<sup>21</sup>, and therefore comply with the meanings given by USEPA.

<sup>18</sup> Ferber, U., Nathanail, P., Bergatt Jackson, J., Krzywon, R, Drobiec, L., Petříková D., Finka M. 2006

<sup>19</sup> Siebielec, G. Rabl-Berger, S., Bluemlein, P., Schweiker, M., Huber, S., I. Wieshofer, I., Biasiol, M, Ajmone Marsan, F., Medved, P., Sobocka, J., Galuskova, I., Vokurkova, P. 2012

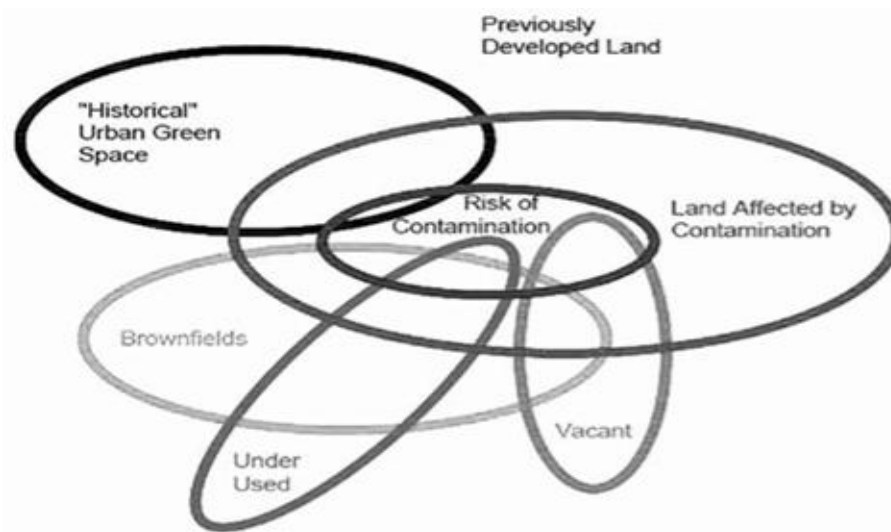
<sup>20</sup> NICOLE Brownfield Working Group. 2011

<sup>21</sup> NICOLE Brownfield Working Group. 2011

As revealed, although not entirely juxtaposed, the national definitions are not in contradiction with the CABERNET definition of brownfields and underline the common characteristics of such sites:

- abandoned,
- often but not always contaminated,
- require reclamation/revitalization,
- relict of industry, construction, agriculture, military or other anthropogenic activities.

Fig. 1, adapted from a diagram originally prepared by the UK Parliamentary Office for Science and Technology and reproduced as Figure 3.1 in the CABERNET Network Report, 2005, provides an illustration of Brownfield land typology:



**Fig. 1.** Relationship between Brownfield-Related Definitions-  
Source CABERNET Network Report, 2005

### *2.3. Classification of brownfields*

In order to ease the definition and discussion of different interventions considered necessary for brownfield revitalization, brownfields may be grouped into four categories as follows:

- (1) Category A – Vacant buildings: Vacant buildings, unoccupied for one year or more, that are structurally sound and in a reasonable state of repair (i.e. capable of being occupied in their present state). The category includes buildings that have been declared redundant or where re-letting for their former use is not expected.
- (2) Category B – Derelict land and buildings: Land so damaged by previous industrial or other development that cannot be used in a suitable way without treatment. Treatment includes any of the following: demolition, clearing of fixed structures or foundations and leveling.
- (3) Category C – Land or buildings currently in use and included in the local plan and/or having planning permission: Includes all the sites currently in use (including buildings vacant for less than one year), allocated for development in the adopted plan or with an outstanding planning permission where revitalization has not started.

- (4) Category D – Land or buildings currently in use where potential for revitalization is positively identified (but the sites are not included in the plan and/or have no planning permission): The category includes the sites currently in use that are likely to be disposed by their owners for any revitalization or conversion in the future.

The recognition of potential sites for revitalization will depend to some degree on local knowledge and judgment. CABERNET classifies brownfield sites in the „A-B-C model”, considering the types of brownfields, costs of revitalization and the site value, where:

- A–type sites are the most perspective ones, which can (and will) be regenerated using only private investments
- B–type sites seem to be less profitable from economic aspects, while
- C–type sites can be revitalized exclusively with the leadership of public sector because they are not attractive for investors at all.

The A-B-C model helps to identify driving forces for the promotion of Brownfield development. It supports both public and private planners to identify adequate strategies to improve economic viability and status of different types of Brownfields. The application of this conceptual model is useful to understand the underlying characteristics of sites that influence re-categorization for example from a B site to an A site. It therefore can be very helpful for the design of site-specific development strategies<sup>22</sup>.

Furthermore, ignorance of problems increases uncertainty. Uncertainties influence perception. As a result, the range of economic viability can change, is being shifted or narrowed. Categorization of sites can help authorities to guide money to those places where it is most needed, which are B and C sites. It is important to consider that categorization itself already can have an effect on the market value. Therefore, planners have to be wary classifying sites in order to avoid drop in the value due to registration or even stigmatization of land<sup>23</sup>.

The European Environment Agency (EEA, 2013) has recently estimated that “there are as many as three million brownfield sites across Europe, often located and well-connected within urban boundaries and as such offering a competitive alternative to greenfield investments”.

It also stated that “unfortunately, no common legislation at European level for the sustainable use of soil resources has been adopted. Thus, there is a lack of impetus for a coherent approach for remedial soil protection, for a harmonized inventory of potentially contaminated sites and how to regenerate them efficiently. Another distinct consequence is the on-going, unrestrained land-take and continued soil sealing all over Europe, often even in regions with shrinking populations”<sup>24</sup>.

The decision of classifying a plot of land as brownfield is subjective and qualitative, usually made by experts. The perception of what a brownfield is, however, is also connected to the local urban and economic qualitative development standards. Additionally, how to deal with

<sup>22</sup> CABERNET Land Quality Management Group (LQMG) 2006

<sup>23</sup> CABERNET Land Quality Management Group (LQMG) 2006

<sup>24</sup> Bartke, S. 2013

brownfield sites is a question that involves various sectors – for example spatial and strategic planning, property development, industrial development or environmental remediation.

These sectorial interests, together with a general absence of reliable and comparative data and the lack of know-how at national, regional and local levels compromise a full recognition of the brownfield issues and often that of the threats they pose to local communities, while their potential contribution to sustainable soil use of communities is also not considered.

Over the last 50 years, the European area has been affected by globalization, with new economic trends and social transitions which have fast led to social, political and lifestyle changes. All these trends in our communities have also brought about changes in spatial development and land use patterns.

Changes have caused the downsizing of local industries, a reduction of armies, and amendments in our methods of farming. They have influenced our usage of railways, dismantled a lot of our national institutions, and so on. On the other hand, the growth of road transport, the new services, information, knowledge based and creative industries, in conjunction with the transformation of our urban lifestyle needs have created significant pressure for new developments. But all these changes have also brought about an ever increasing "consumption" of previously un-built land, either forestry, agricultural or natural land<sup>25</sup>.

These and other factors relating to the use of land have in some instances caused a vast new suburbanization, whereas elsewhere in existing built-up areas, they have created large volumes of vacant, underused or brownfield land. In urban quality terms, on the one side these dynamics of land use have resulted in dereliction, but, on the other side, in new developments with high quality standards. But overall, these changes have also left to many of our communities a significant legacy of brownfield sites, a loss of natural or agricultural and a limited land use economy.

### 3. Conclusions

The brownfields not only represent a threat to their communities, but they also stand for a great challenge, from a social, economic and cultural, environmental and institutional point of view. Despite such challenges, many urban brownfields can be put to new and often exiting uses, but it takes competent strategic planning and urban administration to recognise the costs of this land disuse and respond to it creatively. It also takes a proactive, creative, cross-organisational effort and funding to bump such sites out of their stagnation. Public leadership must provide a range of co-ordinated inputs (policies, instruments, planning, funding and training) to begin to increase the attractiveness of these sites to a point where the market can take hold of them and use the potential inherent in their centrality. With an increasing number of individual brownfield initiatives, there is also a pressing need for networking and for the exchange of experiences and best practices within and between countries that share a similar legacy and predicament regarding their brownfields.

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<sup>25</sup> Bergatt Jackson, J., Vojvodíková, B. 2013

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