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Institutional Framework of Brownfield Regeneration in Serbia

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1 ABSTRACT

The general objective of this study is to present the existing institutional framework of brownfield regeneration in Serbia. However, as the research proceeds on the assumption that successful brownfield regeneration requires the active cooperation of different sectors and disciplines, there are several specific research objectives. Firstly, it is important to elucidate the nature of cooperation between the sectors at the same level, but also between different levels of spatial development. Furthermore, it is interesting to examine if there are specific institutions solely responsible for brownfield regeneration. Thus, the focus of the analysis will be directed to the institutional representatives (at different levels of spatial development) – their roles, responsibilities and limitations regarding the problem of brownfield regeneration. Also, documents relating to brownfield regeneration – laws, strategies, plans, concepts and spatial development programmes will be clarified. Proposed analytical strategy will shed light on the degree of integration between different sectors, disciplines and institutions within the same organisational level, tending to determine the extent of the so-called horizontal collaboration. In addition, the analysis elucidates the vertical collaboration between relevant institutions at national, regional and local level. Furthermore, it provides insight into the position of expert agencies within a certain institutional context. Finally, the analysis clarifies the character (formal or informal) of institutional collaboration. Such an extensive analysis of existing institutional framework of brownfield regeneration in Serbia provides guidelines for its improvement in the context of smart urban growth.

2 BROWNFIELDS IN SERBIA

During socio-economic transition to market economy system, which currently exists in Serbia, the issue of brownfield regeneration has been unjustifiably neglected. The basic problem lies in fact that the term brownfield has been recently defined. Actually, before the adoption of the Spatial Development Strategy of the Republic of Serbia (RASP, 2009) in the year 2009, where the brownfield site was defined as: "(...) land which was previously built and used, but in the meantime, due to financial or other economic reasons became abandoned", there was no clear definition regarding the mentioned locations. Hence, the term is empirically known to the experts in Serbia, but its use in the plans is still pending. In the Belgrade Master Plan - 2021 (Belgrade Gazette, No. 27/03) there is no requirement for the brownfield revitalization. Due to the lack of a unified brownfield site cadastre on the national level, the precise data about the total area of brownfields are unknown. According to the recent data provided by Serbian Investment and Export Promotion Agency - SIEPA (2011), the brownfield area in Serbia occupies approximately 3000 hectares.

2.1 Institutional Framework for Brownfield Regeneration

The Serbian institutional structure for brownfield regeneration is not clearly defined. This comes out from the political, societal, and economic transition which is still in progress. The main challenges in Serbian socio-political context relates to the bankruptcies of many state-owned companies and privatization of the better ones. Nevertheless, the number of firms is still fully or partially owned by the Serbian state. The restitution of nationalized properties is in the process, but not finished. The question of the ownership of the land which is recognized as brownfield is the main barrier to the successful regeneration of these sites. However, the major participants among public sector concerned with brownfields are: Ministry of Regional Development, Privatization Agency, Serbian Investment and Export Promotion Agency (SIEPA), Ministry of Environment, Mining and Spatial Planning, Republic Agency for Spatial Planning, as well as the local authorities (Danilovic and Damjanovic, 2011; Peric, 2009). Brief overview of their roles and responsibilities is shown in the Table 1.

Institution	Functions and Responsibilities
Ministry of Regional	• Its role is the promotion of domestic production, export, and foreign direct

Development	<p>investment.</p> <ul style="list-style-type: none"> Facilitation in restructuring of the large business entities toward international market requirements is always prepared by this institution. The ministry is responsible for the implementation of Integrated Pre-accession Assistance Programme (IPA) which includes specific measures aimed at brownfield redevelopment.
Privatization Agency	<ul style="list-style-type: none"> It has the main role in regard with brownfields which appear as a result of former state-owned enterprises bankruptcy. It manages and sells shares and interests in accordance with the Law on Privatization (Official Gazette, No. 123/07). Its role is to train a number of bankruptcy trustees who will be able to realize the procedure within a reasonable time or the court settlement of creditors which would suspend the bankruptcy process.
Serbian Investment and Export Promotion Agency (SIEPA)	<ul style="list-style-type: none"> It is the state agency responsible for the promotion of investment opportunities as well as for the help to foreign investors when starting business in Serbia. The agency provides the service of brownfield sites locating, assistance in administrative procedures at all levels, as well as mediation with the relevant institutions both at national and local level. It also coordinates direct investment for brownfield projects in the manufacturing sector, services sector, those involved in international trade and strategic projects in tourism, in a way of giving grants.¹
Ministry of Environment, Mining and Spatial Planning	<ul style="list-style-type: none"> Its role is to identify, coordinate and develop the goals of environmental policy in order to achieve sustainable development. The important role within this ministry has the Environment Protection Agency which formulated several reports regarding soil contamination.
Republic Agency for Spatial Planning	<ul style="list-style-type: none"> It is the state agency responsible for preparing, coordinating and monitoring the development of all the spatial plans in Serbia. This institution also provides technical assistance for the preparation of planning documents within local governments. The crucial role of the agency in brownfield regeneration process is to bind the state authorities with the experts from the both academy and research institutes. The agency also prepared the most important documents with regard to the topic of brownfield regeneration: The Spatial Development Strategy of the Republic of Serbia from 2009 to 2020 (in 2009) and The Spatial Plan of the Republic of Serbia from 2010 to 2020 (in 2010).
Local authorities	

Table 1: Institutional framework for brownfields in Serbia (Source: Prepared by authors)

The specificity of local authorities in Serbia should be noted here. Namely, Serbian local authorities often lack accurate information about the percentage of building land in the category of brownfield sites within the whole territory of the municipality (Gligorijevic et al., 2007). According to the same source, the municipalities do not realize that in most cases the private investors withdraw investment because of the increased risks and costs. As Begovic points out, Serbian local governments do not have a vision of development, in terms of understanding the brownfield regeneration as a process that brings long-term profit. Specifically, the property tax is considered the main source of revenue that should be provided even if the activity that takes place in the municipality area has more negative (environmental, social) than positive (financial) effects (Begovic, 2002). Therefore, in Serbia there are no examples of turning the industry

¹ Grants are awarded in the amount of 2.000 to 10.000 euro per new job created, for a period of three years (SIEPA, 2011).



complex into the green park, which can lead to a greater investor interest, the price increases of the surrounding buildings, and the new jobs, i.e. to new revenue for the municipality.

2.2 Legal Regulations for Brownfield Regeneration

In contrast to the previous case studies, the topic of brownfield regeneration has been recently recognized in Serbian spatial planning and development documents. The breakpoint was the adoption of official term for brownfield site in 2009 within the Spatial Development Strategy of the Republic of Serbia from 2009 to 2020 (SDSRS) (RASP, 2009). Until that period of time, planning documents operated with the notion of urban renewal instead of the explicit definition of brownfield site (Vujovic and Petrovic, 2007). Also, brownfield regeneration was a part of several documents mainly based on the topic of environment protection and soil contamination. Thus, the Environmental Protection Law (Official Gazette, No. 135/04) defines the principle of the „polluter pays” concerning the cleaning-up costs, i.e. costs incurred with regard to contamination of environment as well as the remediation of damages to it. Regional Development Strategy for Serbia from 2007 to 2012 (Official Gazette, No. 21/07) indirectly indicates brownfield regeneration through introducing „clean technologies” in the devastated industrial clusters. Planning and Construction Law (Official Gazette, No. 72/09, 24/11) does not provide the answer about brownfield issue in a sustainable way. The tendency of introducing new urban functions in central city areas exists, but the way how to achieve that without a threat for public interest is still unclear.

Since 2009 the topic of brownfield regeneration became visible in main spatial planning documents. Namely, SDSRS from 2009 to 2020 (RASP, 2009, p. 45) set the “strict control of irrational spreading of building zones and greater involvement in brownfield regeneration” as one of the main spatial development priorities. Also, the scenario of sustainable spatial development means the displacement of industrial locations from the central areas (RASP, 2009, p. 48), and brownfield regeneration is seen as one of the instruments to achieve reformed and transparent system and land-use policy (RASP, 2009, p. 90). The same document recommends the brownfield site as a mechanism for regional and local identity preservation (RASP, 2009, p. 119). The most important part of this document deals with the possible guidelines for brownfield regeneration in Serbian context. Some of them are:

- Public sector must be responsible for the brownfield site remediation;
- The role of local governance is of crucial importance - it has to collaborate with public, private, and civil sector;
- Responsible plan implementation is a base for successful brownfield regeneration;
- Companies bankruptcy and their privatization as a instrument in dealing with brownfields;
- Public-private partnerships as a balance between different interests;
- Education and public promotion of brownfield regeneration should obtain a system support.

Besides everything aforementioned, the Law on the Spatial Plan of the Republic of Serbia from 2010 to 2020 (Official Gazette, No. 88/10) emphasizes the importance of brownfield regeneration as a means to better utilization of Serbia territorial capital (Official Gazette, No. 88/10, p. 47). The same document proposes the regeneration of unused military sites and objects as one of the several possible types of brownfield sites (Official Gazette, No. 88/10, p.120). The main strategic priorities to be achieved by 2014 within this document are:

- Brownfield cadastre with evaluation on the national level, which leads to efficient site revitalization;
- Establishment of institution (national level) in charge of brownfield regeneration.

3 CONCLUDING REMARKS

Based on previous brief overview of institutional and legal framework of brownfield regeneration in Serbia, some conclusions can be drawn. Namely, the following remarks concern three aspects of brownfield regeneration, such as: institutional collaboration, position of expert agency, and institutional support to collaboration of various sectors.

Institutional collaboration. Although collaboration among institutions responsible for regional development is prescribed by law (Official Gazette, No. 88/10), in the practice of brownfield regeneration the extent of

institutional collaboration depends on the various planning levels. At national level, cooperation between several sectors in order to create development documents is not effective, which stems from the unclear responsibilities of different sectors in a given process. However, the national body which tends to achieve a higher degree of horizontal collaboration is the Republic Agency for Spatial Planning (RASP), which acts as a mediator between the national government (ministries) and experts (as representatives of academia, and research institutes). At national level, the role of intermediary is also devoted to the Agency for Foreign Investments and Export Promotion (SIEPA). It provides assistance in administrative procedures at all levels, as well as in mediation with relevant institutions - national and local. On the other hand, there is no effective cooperation and exchange of experiences among different local governments. There is a distinct need for municipalities which already developed brownfield regeneration policies (e.g. Niš, Subotica) to share their experiences with other municipalities that have a low level of understanding of the brownfield regeneration effects (SKGO, 2011). The networking of activities as well as promoting of brownfield activation contribute to the improvement of abilities, skills, and motivation of employees in the public sector.

Vertical institutional collaboration is not developed to its full potential due to the absence of regional level of administration (Stojkov, 2012). Thus, in Serbia, despite the legal prescriptive (Official Gazette, No. 129/07), local authorities or their associations do not participate in the preparation of regulations related to sustainable land use as one of the priorities of municipal development.

Position of expert agency. At national level, RASP deals with the preparation of strategies and spatial development plans in accordance with the policies of sustainable land use. However, these documents are general in their nature, so Serbia lacks professional expertise in the field of brownfield regeneration (Bojovic, 2010). This is primarily seen in the absence of the National Agency for brownfield regeneration, and lack of cooperation with expert agencies at international level. In addition to this, the lack of a national strategy of brownfield regeneration is obvious, which is caused by missing the basic documents important to the success of such a process – brownfield cadastre and unique database of brownfield sites.

At local level, there is also a lack of brownfield related topics within strategic and planning documents of local government. Assuming of brownfield regeneration as a priority of local spatial development is sporadic and does not occur as the initiative of municipal representatives. The reason for this is the inadequate local professional capacity for the different aspects of brownfield regeneration, which should seek for the ability of an efficient decision-making, transparency of information, skills of mediation and facilitation, etc.

Institutional support to collaboration of various sectors. Law on Spatial Plan of the Republic of Serbia from 2010 to 2020 (Official Gazette, No. 88/10) clearly stipulates not only cooperation between various institutions responsible for the given area, but it also supports the cooperation of various sectors, primarily public and private one. However, in planning practice of brownfield regeneration there are two inconsistencies. On the one hand, a small number of local authorities do not assume public-private partnership as a form of cooperation that contributes to the brownfield regeneration effectiveness. On the other hand, when a public-private partnership is recognized as a mechanism for brownfield regeneration, there is often unequal cooperation between private sector – which has a great financial power, and public sector – which is characterized by inadequate professional power and the inability to control the whole process of brownfield regeneration.

Besides institutional collaboration, the Spatial Plan of the Republic of Serbia from 2010 to 2020 (Official Gazette, No. 88/10) proposes the development of informal forms of cooperation in decision-making process, particularly emphasizing the collaboration with civil sector. However, non-institutional instruments to stimulate brownfield regeneration do not exist. Thus, the inactivity of civil society in defining the objectives to be achieved by brownfield regeneration indicates a non-transparent policy formulation in a given domain.

Thus, the general conclusion is that Serbia took first steps towards understanding the problem of brownfield regeneration. This is primarily related to new planning instruments (plans and strategies) which treats the mentioned concept. It is also important that these documents emphasize the institutional responsibility for formulating the ways for the sustainable land use which means not only institutional collaboration, but also the collaboration of different sectors. However, current (unsatisfactory) state of brownfield regeneration in Serbia is caused, on the one hand, by the lack of appropriate measures serving for implementation of policies defined at national level. On the other, there is a certain lack of understanding the need to change approach to contemporary urban problems. In addition, inadequate treatment of brownfield regeneration is conditioned



by non-education of experts in accordance with current planning paradigms, as well as unregulated cooperation between various sectors within brownfield regeneration process.

4 REFERENCES

- BEGOVIĆ, Boris: Ekonomski aspekti upravljanja lokalnom zajednicom: ka povećanju ekonomske efikasnosti (Economic aspects of the local community governance: toward economic efficiency increase). In: Principi modernog upravljanja lokalnom zajednicom (The Principles of modern local community governance), B. Begović et al., eds. Beograd: Centar za liberalno-demokratske studije (Belgrade: The Center for Liberal-Democratic Studies), pp. 112-128, 2002.
- Belgrade Gazette, No. 27/03. Belgrade Master Plan - 2021.
- BOJOVIĆ, Jelena: Lokalni ekonomski razvoj - priručnik za praktičare (Local economic development – Handbook for practitioners). Beograd: The Urban Institute, USAID, 2010.
- DANILOVIC, Klara and DAMJANOVIC, Dusan: Mogućnosti ozivljavanja braunfilda u Srbiji (The possibilities of brownfield revitalization in Serbia). In: Proc. Susreti urbanista (The Meetings of Urban Planners). Novi Becej, Serbia, 2011. <<http://www.vuu.org.rs>> (Nov. 26, 2011).
- GLIGORIJEVIC, Zeklina, DAMJANOVIC, Dusan, DANILOVIC, Klara, ZEKOVIC, Slavka and STOJKOV, Borislav (eds.): Ozivljavanje braunfilda u Srbiji (Brownfield Revitalization in Serbia). Beograd: PALGO centar (Belgrade: PALGO Center), 2007.
- Official Gazette (Sluzbeni glasnik), No. 72/09, 24/11. Planning and Construction Law (Zakon o planiranju i izgradnji).
- Official Gazette (Sluzbeni glasnik), No. 88/10. Law on the Spatial Plan of the Republic of Serbia from 2010 to 2020 (Zakon o prostornom planu Republike Srbije - 2010-2020).
- Official Gazette (Sluzbeni glasnik), No. 21/07. Regional Development Strategy of the Republic of Serbia from 2007 to 2012 (Strategija regionalnog razvoja Republike Srbije za period od 2007. do 2012. godine).
- Official Gazette (Sluzbeni glasnik), No. 135/04. Environmental Protection Law (Zakon o zaštiti životne sredine).
- PERIC, Ana: Interesna usaglasenosnost aktera u procesu regeneracije braunfild lokacija (Interest compliance of actors in the process of brownfield regeneration). In: Regionalni razvoj, prostorno planiranje i stratesko upravljanje (Regional Development, Spatial Planning and Strategic Governance), I. Maric and S. Milijic, eds. Beograd: IAUS (Belgrade: Institute of Architecture and Urbanism of Serbia), pp. 37-58, 2009.
- RASP (Republic Agency for Spatial Planning) (Republička agencija za prostorno planiranje): Spatial Development Strategy of the Republic of Serbia from 2009 to 2020 (Strategija prostornog razvoja Republike Srbije - 2009-2020). Belgrade, 2009.
- SIEPA (Serbian Investment and Export Promotion Agency): Lokacije - SIEPA baza investicionih lokacija (Locations - SIEPA base of investment locations). Belgrade, 2011. <<http://serbia-locations.rs>> (Nov. 25, 2011).
- SKGO (Stalna konferencija gradova i opština): Reaktiviranje braunfilda u Srbiji - Sistemski pristup ili ad hoc rešenja? (Reactivation of brownfields in Serbia – Systematic approach or ad-hoc solutions?) Beograd: SKGO, 2011.
- STOJKOV, Borislav: The spatial planning systems in Serbia and Austria - a comparison. In: Prostorno planiranje u Srbiji – aktuelne teme (Spatial Planning in Serbia – current topics), B. Stojkov and M. Dobričić (eds.). Belgrade: RASP, pp. 8-20, 2012.
- VUJOVIC, Sreten and PETROVIC, Mina: Belgrade's post-socialist urban evolution: Reflections by the actors in the development process. In: The Post-Socialist City: Urban Form and Space Transformations in Central and Eastern Europe after Socialism, K. Stanilov, ed. Dordrecht: Springer, pp. 361-384, 2007.