PROSTOR

28 [2020] 1 [59]

ZNANSTVENI ČASOPIS ZA ARHITEKTURU I URBANIZAM
A SCHOLARLY JOURNAL OF ARCHITECTURE AND URBAN PLANNING

POSEBNI OTISAK / SEPARAT | OFFPRINT

SVEUČILIŠTE U ZAGREBU, ARHITEKTONSKI FAKULTET
UNIVERSITY OF ZAGREB, FACULTY OF ARCHITECTURE

ISSN 1330-0652
https://doi.org/10.31522/p
UDK | UDC 71/72
CODEN PORREV
28 [2020] 1 [59]
1-200
1-6 [2020]

Af

ZNANSTVENI PRILOZI | SCIENTIFIC PAPERS

Fig. 1 Aerial view of the City of Kranj with brownfield sites (lower-right corner)
Sl. 1. Pogled iz zraka na grad Kranj s *brownfield* lokacijama (donji desni ugao)

Boštjan Cotič[1], Lucija Ažman Momirski[2]

[1] Urban Planning Institute of the Republic of Slovenia
Slovenia – 1000 Ljubljana, Trnovski pristan 2
[2] University of Ljubljana
Faculty of Architecture
Slovenia – 1000 Ljubljana, Zoisova 12
bostjan.cotic@uirs.si
lucija.azman@fa.uni-lj.si

Scientific Subject Review
https://doi.org/10.31522/p.28.1(59).11
UDC 711.14 (497.4) "20"
Technical Sciences / Architecture and Urban Planning
2.01.02. – Urban and Physical Planning
Article Received / Accepted: 27. 4. 2020. / 23. 6. 2020.

[1] Urbanistički institut Republike Slovenije
Slovenija – 1000 Ljubljana, Trnovski pristan 2
[2] Sveučilište u Ljubljani
Arhitektonski fakultet
Slovenija – 1000 Ljubljana, Zoisova 12
bostjan.cotic@uirs.si
lucija.azman@fa.uni-lj.si

Pregledni znanstveni članak
https://doi.org/10.31522/p.28.1(59).11
UDK 711.14 (497.4) "20"
Tehničke znanosti / Arhitektura i urbanizam
2.01.02. – Urbanizam i prostorno planiranje
Članak primljen / prihvaćen: 27. 4. 2020. / 23. 6. 2020.

Inventory of Brownfield Sites in Slovenia: Towards a New Methodology

Popis *brownfield* lokacija u Sloveniji: prema novoj metodologiji

BROWNFIELDS
DEGRADED URBAN AREAS
INVENTORY
METHODOLOGY
URBAN REGENERATION
Slovenia

BROWNFIELD LOKACIJE
DEGRADIRANI URBANI PROSTORI
POPIS
METODOLOGIJA
URBANA REVITALIZACIJA
Slovenija

The paper compares methods and results concerning the two most recent inventories of brownfield sites in Slovenia: while the MOP inventory focuses more on spatial planning issues, the MGRT inventory concentrates more on economic issues. Therefore, the two methodologies used cannot be properly combined and a new methodology for brownfields inventory is only able to adopt certain elements of each.

U radu se prikazuju metode i rezultati koji se odnose na usporedbu dva novija popisa *brownfield* lokacija u Sloveniji: popis MOP-a usmjeren na probleme prostornog planiranja i popis MGRT-a usmjeren na gospodarske probleme. Stoga se dvije korištene metodologije ne mogu adekvatno kombinirati. Nova metodologija za izradu popisa *brownfield* lokacija mogla bi usvojiti neke elemente iz obje postojece.

Introduction[1]

Uvod

The large number of brownfield sites in Europe and limited resources available to ensure their regeneration have created the need for more efficient processes for regenerating brownfield sites.[2] The European Commission is particularly aware of these problems, having allocated large sums of money from the EU Structural and Cohesion Funds to solve problems related to brownfield sites. Several related important research projects were funded, including[3]: CABERNET[4], CLARINET[5], CARACAS[6], REVIT[7], COBRAMAN[8], HOMBRE[9] and TIMBRE[10].

The Bath model developed in the CABERNET project shows the emergence of brownfield sites is a continuous urban process. Due to the relocation of labour-intensive production to third countries, especially China, and the associated collapse of companies, this process in Central and Eastern European countries was very intense during the 1990s.[11] In Slovenia, brownfields mostly occurred as a result of industrial activities and army barracks in urban centres being abandoned and relocated to the outskirts of settlements.[12] Only a few examples of heavily polluted brownfield sites exist in Slovenia, typically the outcome of abandoned heavy or chemical industrial activities.[13]

- What is a brownfield site? – The definition of brownfield site has attracted considerable attention.[14] The term "brownfields" is often used to designate former industrial and commercial sites that are either polluted[15], unused and/or abandoned. In addition, a brownfield site may be described 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".[16] Ways of defining the concept of brownfield site differ from country to country, but the term generally has a dual character: it refers to both environmental and economic problems.[17] The literature shows that assumptions are commonly made about the size or extent of brownfields, such as they are mostly large industrial complexes, yet little is known about smaller sites like petrol stations or machine shops[18], noting that the identification of brownfield sites in some cities could prove critical.

---

1 This research paper is elaborated as a reflection on the first author's Ph.D. progress entitled *Evaluation and Development of a Brownfields Inventory Methodology in Slovenia, the Case of the City of Kranj,* at the University of Ljubljana, Faculty of Architecture, Ljubljana, Slovenia. Supervised by: prof. dr. Lucija Ažman Momirski.

2 Oliver et al., 2005

3 Particular emphasis in these projects was placed on managing the processes of brownfield regeneration. [Limasset et al., 2018; Mušič, Cotič, 2012]

4 CABERNET: EU project and network entitled *The Concerted Action on Brownfield and Economic Regeneration Network* (2001-2004). The aim of the CABERNET network was to develop new tools to support the regeneration of Brownfield sites in urbanised areas and, in this way, enable the sustainable development of European cities. See: https://www.researchgate.net/publication/228789048_The_Scale_and_Nature_of_European_Brownfield [27.1.2020]

5 CLARINET: EU project and network entitled *Contaminated Land Rehabilitation Network for Environmental Technologies* (1998-2002). The CLARINET perceived developed technical recommendations for decision-making on the rehabilitation of contaminated sites in Europe and for identifying research and development needs for this topic. See: http://www.eugris.info/DisplayProject.asp?ProjectID=4420 [5.12.2019]

6 CARACAS: EU project entitled *Concerted Action on Risk Assessment for Contaminated Sites in Europe* (1996-1998). The aim of the CARACAS project was to evaluate the practical state-of-the-art of contaminated land risk assessment, collect risk assessment approaches in European countries and prepare recommendations on scientific priorities for future R&D programmes in the EU in this topic. See: http://www.eugris.info/displayproject.asp?Projectid=4575 [5.12.2019]

7 REVIT: EU project entitled *Towards More Effective and Sustainable Brownfield Revitalization Policies* (2000-2006). The REVIT project developed new approaches for different aspects of brownfield regeneration. To ensure the practical realisability of the new approaches, tools were tested in the partners' areas. See: http://www.eugris.info/displayproject.asp?Projectid=4509 [5.12.2019]

8 COBRAMAN: EU project entitled *Manager Coordinating Brownfield Redevelopment Activities* (2008-2012). The COBRAMAN project provided essential knowledge for the management of regeneration processes. Tools developed in the project can assist municipalities to develop such areas in more rapidly and more effectively. The project developed a study course for a new profile – Brownfield redevelopment manager. See: http://cobraman.uirs.si [5.12.2019]

9 HOMBRE: EU project entitled *Holistic Management of Brownfield Regeneration* (2010-2014). The HOMBRE project focused on strategies, technologies and solutions

The Slovenian Spatial Planning Act[19] defines a devalued area as "an area which, due to its inappropriate or abandoned use, has reduced its economic, social, environmental or visual value or value according to the criteria for the protection of cultural heritage and is in need of renovation. Based on physical, functional, environmental, social and cultural heritage criteria, devalued area may show different types and levels of devaluation". "Devalued area" (in Slovenian: *razvrednoteno območje*) is a notion used in ZureP-2 and equivalent to "brownfield site" in the English language. Until 2017, the notion used in Slovenian for a brownfield was a degraded urban area (*degradirano urbano območje* – DUO). Use of the term degradation is now exclusively reserved for areas with confirmed pollution or contamination under the Environmental Protection Act.[20]

The notion brownfield is not used in Slovenia in the same way as in certain other non-English-speaking countries like Czechia[21] or Croatia[22]. The definition of devalued sites (previously degraded urban area or DUO) in Slovenia is based on criteria similar to the criteria for brownfield applied in Ireland, the UK and Scotland and the use of the notion in both the Slovenian legislation (and language) is very similar to the English term brownfield as used in the UK, Ireland and Scotland.[23]

In 2020, a new/revised Spatial Development Strategy of Slovenia is expected. It will be harmonised with the Spatial Planning Act from 2017 and will therefore also use the new notion of devalued areas.

• Brownfield regeneration – The UK has taken a very systematic approach to regenerating brownfields[24] and acts as a role model for many countries. There is no comparable systematic approach to brownfield regeneration in Slovenia, yet there are several successful examples in Slovenia. Among many possible reasons for this achievement, one important factor that has enabled successful regeneration is the constant growth of the real estate market over the years.

• Research subject – In order to tackle the problem of brownfields, it is necessary to define how many brownfields exist, their size and current status. This is step one in the process of managing the redevelopment of brownfield sites. The importance of this phase is shown in the RETINA[25] project as the initial phase[26] of its brownfield regeneration model.

On Brownfield Inventories

O popisima *brownfielda*

• Theoretical background on brownfield inventories, literature review – Keyword searches in the Scopus database only produce 44 scientific papers on brownfield inventory. The first paper dates from 1998 and there are two publication peaks, 2004 and 2012, with ever more papers being published in recent years. In Central and Eastern Europe, brownfield issues have been associated with the political and economic shifts and industrial restructuring after 1989.[27] Most studies focus on brownfield-regeneration processes of brownfield sites and their inventory[28], ideally one where the data are well geo-referenced[29] as part of this process.[30] The input data usually come from records of brownfield inventory databases of national statistical offices or public national databases. In some countries, the brownfield databases are strictly confidential and not

for brownfield management. It addressed the need to prevent the depreciation of urban, industrial and mining areas before they become brownfields. See: www.zerobrownfields.eu [5.12.2019]

10 TIMBRE: EU project entitled *Tailored Improvement of Brownfield Regeneration in Europe* (2011-2014). The TIMBRE research project aimed to "support end-users in overcoming existing barriers by developing and providing customised problem- and target-oriented packages of technologies, approaches and management tools for a megasite's reuse planning and remediation". See: http://www.timbre-project.eu/timbre-project.html [5.12.2019]

11 Ferber, 2006; Garb, Jackson, 2011

12 Lampić et al., 2017

13 De Sousa, 2017

14 Mehdipour, Nia, 2013

15 US Environmental Protection Agency. Brownfields and Land Revitalization, http://www.epa.gov/brownfields/. It is estimated that there are more than 450,000 brownfields in the USA.

16 Alker et al., 2000

17 Yount, 2017

18 Heberle, Wernstedt, 2006; Frickell, Elliot, 2008

19 *** 2017 (ZureP-2, *Zakon o urejanju prostora*, see URL: https://www.uradni-list.si/glasilo-uradni-list-rs/vsebina/201701-2915 [1.6.2019]

20 *** 2006

21 The Czech language uses loanword-mutated terms for brownfield and regeneration from the English language (Czech: *Regenerace brownfieldu*), Národní strategie regenerací brownfieldu 2019-2024, 2019; Ilík, Bergatt Jackson, 2006

22 Matković, Jakovčić, 2019: 350

23 Heasman et al., 2011

24 Otsuka et al., 2013

25 RETINA: EU project entitled Revitalisation of Traditional Industrial Areas in South-East Europe (2007-2013). The project addressed the problems of delayed and hindered brownfield regeneration due to legal, financial, organisational and image problems. An integrated approach was proposed via a jointly developed revitalisation method consisting of a model masterplan and a strong stakeholder engagement campaign [BRM, 2012]. See http://www.southeast-europe.net/en/projects/approved_projects/?id=94 [5.12.2019]

26 BRM, 2012. See: http://www.southeast-europe.net/document.cmt?id=457 [5.12.2019]

27 Sroka, 2019

28 Noviks et al., 2009

29 Limasset et al., 2018

30 Rizzo et al., 2018

publicly accessible. Many scientific papers have considered the results of the scientific projects listed above.

• National brownfield inventories – At the national level, the UK maintains an up-to-date database. NLUD-PDL[31] is a database maintained by the English Office for National Statistics since 2004.[32] The UK also maintains the specialised Brownfield land registers[33] created under a new 2017 law.[34] This law requires all planning authorities to prepare a register of brownfield sites based on a standard methodology. The register also provides the legal basis for obtaining co-financing for brownfield regeneration.

Czechia is an example of good practice in Central and Eastern Europe in systematically solving the problem of brownfield sites. Since 1992, when the Czechinvest public agency was established, such sites have been promoted as primary investment areas. The Agency is similar in purpose to the Slovenian agency SPIRIT.[35] On its website, Czechinvest enables advanced searches using different criteria throughout the brownfield site database.[36] The database has public and non-public parts. The database's public part includes locations for investors, while the non-public part serves statistical purposes and supports brownfield regeneration. The database currently contains records of 3,500 locations, of which over 450 are revealed on the site.

• Brownfield inventory in Slovenia – from modest beginnings to two comprehensive methodologies – Awareness of the brownfield site problem in Slovenia grew soon after the country achieved its independence, at least since 1994.[37] The first studies on such areas aimed to understand the reasons for the phenomenon's occurrence, but did not undertake any systematic inventory of these sites.

The first attempt at a short inventory is a publication entitled *Degradirana urbana območja* [Degraded Urban Areas – DUO] in 1998.[38] Although the study did not exclusively aim to make an inventory of brownfield sites, it was important by identifying areas holding potential for spatial (re)development. The study also defined "degradation" and the reasons for the emergence of degraded areas, while analysing the main types of brownfield sites in 33 Slovenian municipalities.

Later came several attempts in Slovenia to carry out a comprehensive inventory at the municipal level. In the analytical phase of preparing for the new Spatial Development Plan for the City of Ljubljana, a study called The Distinctive Structure of the City was produced.[39] While the notion of degraded areas does not appear in this analysis, a map of Ljubljana was created in which so-called stable and transformable structures were defined.

Within the framework of the COBRAMAN project, an inventory of brownfield sites in the inner area of the City Municipality of Kranj was developed in 2008.[40] Ten priority sites were listed (including their spatial characteristics, orthophoto depiction of the area, development history of the area, photo documentation, ownership structure, current land use and planned land use in spatial planning documents), as identified using the criteria of physical and functional degradation.

The project "Sustainable Remediation of Environmental Burdens as a Sustainable Development Opportunity of Slovenia"[41] consisted of two parts, where part two focused on brownfield sites. This was the first systematic inventory of brownfield sites in Slovenia. The authors also designed a system for database maintenance and noted that the records were still incomplete because one of the criteria, based on the commissioner's demand, was only to include areas bigger than 1 hectare.

In 2015, the project "Establishment of an Active Register of Spatially and Functionally Degraded Areas for the Gorenjska Region" was conducted.[42] Despite being a student[43] project, it was an important step towards developing a comprehensive methodology for an inventory of brownfields. It included all 18 municipalities of the Gorenjska statistical region, upgraded the 2012 methodology and defined 10 different types of functionally degraded areas [FDO]. The project recorded 70 FDOs, covering 308.6 hectares. Particular attention was paid to the database-updating process, which involved the Regional Development Agency (BSC Kranj acts as a regional

31 NLUD-PDL stands for The National Land Use Database of Previously Developed Land

32 See: https://www.gov.uk/government/collections/national-land-use-database-of-previously-developed-land-nlud-pdl [5.12.2019]

33 See: https://www.gov.uk/guidance/brownfield-land-registers [5.12.2019]

34 The Town and Country Planning (Brownfield Land Register) Regulations 2017. See: http://www.legislation.gov.uk/uksi/2017/403/contents/made [5.12.2019]

35 Public Agency for Entrepreneurship, Internationalization, Foreign Investments and Technology. See: https://www.spiritslovenia.si/ [5.12.2019]

36 See: https://brownfieldy-dotace.czechinvest.org/Aplikace/bf-public-x.nsf/bfs.xsp [5.12.2019]

37 Špes et al., 2012

38 Koželj et al., 1998

39 Dimitrovska et al., 2001

40 Čelik, 2008

41 Target Research Program, October 2010 – September 2012, co-funded by the Slovenian Research agency [Špes et al., 2012]

42 Lampič et al., 2015

development agency for the Gorenjska statistical region and as a business support centre[44]) and associated municipalities.

Two more projects developed a comprehensive methodology for a brownfield site inventory.

The project "Comprehensive Methodology for the Inventory and Analysis of Degraded Areas, the Implementation of a Pilot Inventory and the Establishment of an Up-to-date Register"[45] (MGRT[46] study) is a continuation of two earlier research projects.[47] The study's main objective was to list all brownfield sites in pilot statistical regions and determine whether a site is abandoned, out of function and therefore shows potential for reactivation. When the project finished, the MGTR tendered a new research project called Supplementary Inventory of Functionally Degraded Areas in the Five Statistical Regions, which was concluded in 2017. This additional project enabled an inventory of brownfield sites in the remaining five statistical regions in Slovenia not included in the pilot inventory of the first project.[48] A quality and complete inventory of brownfield sites across the whole of Slovenia was thereby accomplished.

Just a few months before the MGRT's study was tendered, the MOP[49] launched a research project to prepare an inventory of brownfield sites in 11 city municipalities in Slovenia (the MOP study[50]). The research project was completed in early 2016. It is important to note that those conducting the MGRT project followed the progress of the MOP study so as to become familiar with the methodological approach and attempted to make the two inventories as compatible as possible. In total, 746 potential NERUOs[51] were identified, covering an overall area of 3,656.75 hectares. The data also include areas based on suspected social and environmental degradation.

- Research goal – The aim of this research is to analyse differences and/or similarities between the two methodological approaches to brownfields used in the MGTR and MOP studies. We argue that the definitions of brownfield sites, types of degradation, the (minimum) size of the inventory, the types of brownfield sites and the inventory results of the MGRT and MOP are quite different and that the two methodologies therefore cannot be combined to produce a single inventory method for brownfields. However, their results and individual methodological constituent parts allow new recommendations to be made for a future methodology for an inventory of brownfields.

Data and Methodological Approach

Podatci i metodološki pristup

To find differences and/or similarities in the two research projects we used the comparative method. By definition, comparison is the simultaneous or explicit observation of two or more objects, data or things in order to take advantage of their common characteristics or differences. In this research, we analysed four topics:

– the definition of a base unit (brownfield) and the scope of each research project;
– types of degradation;
– the (minimum) size of the inventory area; and
– types of degraded areas/brownfields.

The results of the MGTR and MOP inventories were compared at a general, methodological level (for all topics) and for the case study area of the City Municipality of Kranj (Fig. 1; for the fourth topic), which was selected for several reasons. The municipality has been actively involved in regenerating brownfield sites since 2008 when the first comprehensive inventory of the municipality occurred within the COBRAMAN project. Due to the experience acquired by the administration in establishing the municipal brownfield inventory, several other projects (including the MOP and MGRT) have used Kranj as a testing area for their methods.

The comparison of the inventory results was performed with ESRI ArcGIS software. We received the data in ESRI shapefile form in the MGI_1901_Slovene_National_Grid coordinate system, which was changed to the D48_Slovenia_TM coordinate system. The area calculation was then carried out in this coordinate system. Prior to the analysis, it was necessary to standardise the data from the

43 Involving students of geography and landscape architecture.

44 See: http://www.bsc-kranj.si/ [7.12.2019]

45 Funded under the Targeted Research Programme of the Slovenian Research Agency (October 2015 – June 2017). The research project was co-financed by the Slovenian Ministry of Economic Development and Technology. The project consortium consisted of the Faculty of Arts, Department of Geography, the Faculty of Civil Engineering and Geodesy, and the Geodetic Institute of Slovenia.

46 MGRT is an acronym for the Ministry of Economic Development and Technology as expressed in Slovenian.

47 Sustainable remediation of environmental burdens, as well as the sustainable development opportunity of Slovenia from 2012; Establishment of an active register of spatially and functionally degraded areas for the Gorenjska region.

48 Lampič, Bobovnik, 2017

49 MOP is the acronym for the Ministry of Environment and Spatial Planning as expressed in Slovenian.

50 The project called Criteria for Defining Degraded Urban Areas [DUO2[with an upgrade: definition of Non-Revitalised Urban Areas [NERUO] was tendered to the Faculty of Architecture.

51 NERUO: Non-Revitalised Urban Areas (Slovenian: *nerevitalizirana urbana območja*)

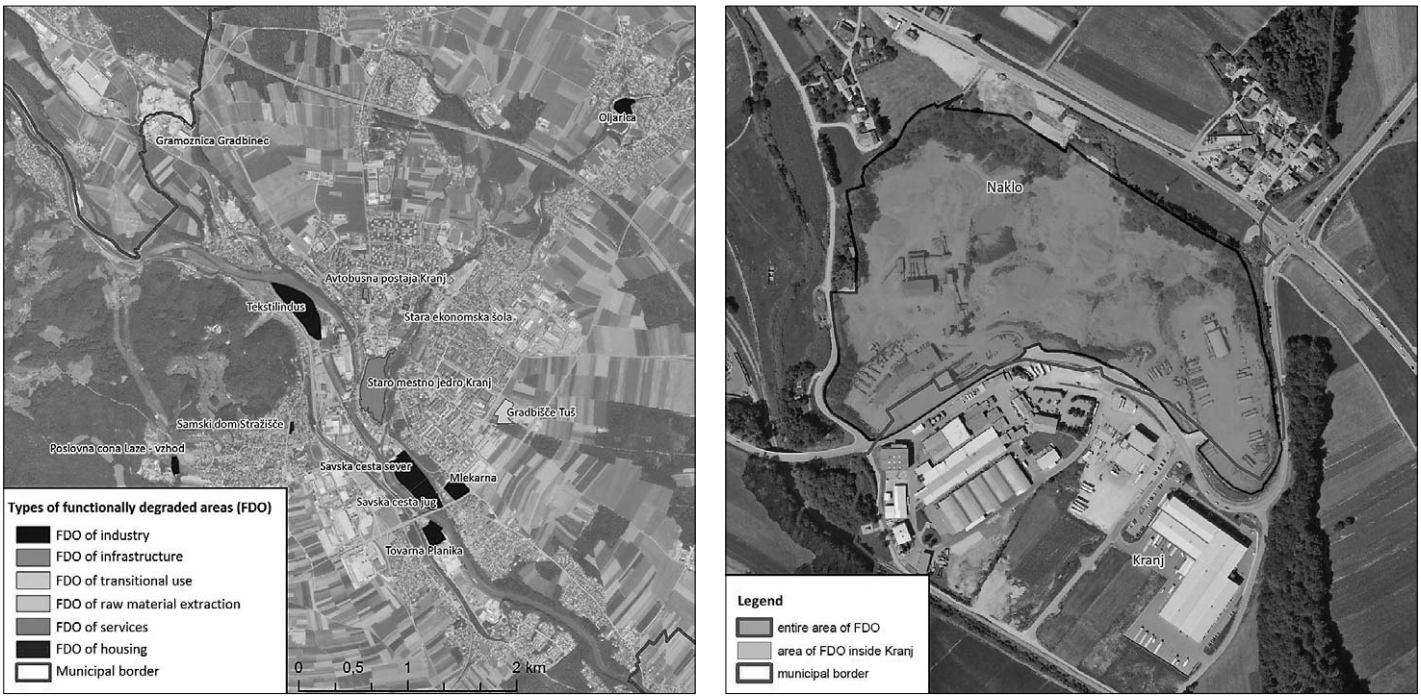


Fig. 2 The spatial distribution of different types of FDO

Sl. 2. Prostorna distribucija različitih tipova funkcionalno degradiranih područja [FDO]

Fig. 3 The FDO data (MGRT study) were delimited by the perceived area of degradation and do not follow the cadastral data

Sl. 3. FDP podaci (projekt MGRT) definirani su promatranim područjem degradacije i ne slijede katastarske podatke

MOP inventory since some areas were included more than once. According to the MGRT inventory, one area is located on the outskirts of the Kranj municipality and also extends to the neighbouring municipality. We limited this area to the border of the municipality so only that part located in the Municipality of Kranj was considered while calculating the total area. The overlapping areas were obtained with the Intersect tool.

Results and Discussion

Rezultati i diskusija

• Definitions of brownfield sites – The fundamental difference between the two inventories arises from their definition of brownfield site and their different scopes/objectives. The MGRT research project's definition is broader in the common features of a brownfield: insufficient use of the area, various forms of pollution, reduced value of the area, visible impact of previous land use, a state of neglect or abandonment, potential for development, and the need for revitalisation and regeneration.

However, the authors then narrowed the definition down to the first set of common brownfield features, i.e. to FDOs that "often present the potential for re-development. The objective for the FDO inventory is to identify those areas that are not in function or main function is performed to a limited extent".[52] Based on this narrower scope, they adapted the general definition of the FDO: "... FDO is an underutilized or abandoned area with a visible impact of prior use and reduced usefulness and may represent potential for redevelopment. FDOs can be activated by sectorally harmonized regulations and measures for renovation and reactivation or can be restored (with certain measures) in a state as it was before the activity was carried out."[53]

The MOP research project defined DUO as "... an area within settlements that is devalued by its status, characteristics and image due to the effects of inappropriate use or abandonment. A DUO site can show different types and levels of devaluation based on physical, functional, environmental or social criteria...".[54] They introduced an additional definition of NERUO as: "... areas where, through various measures, such as renovation, rehabilitation, introduction of new uses and activities we can ensure more economical and efficient use, thus supporting sustainable development...". The NERUO definition extends that for DUO by including areas where social degradation and/or environmental pollution is suspected.

The definition of a basic inventory area [NERUO] in the MOP study is wider than the previous DUO definition, whereas the definition of a basic inventory area [FDO] in the MGRT study is narrower than the DUO definition, even with the latter's expanded definition of brownfield area that includes sus-

52 Lampič et al., 2017
53 Lampič et al., 2017

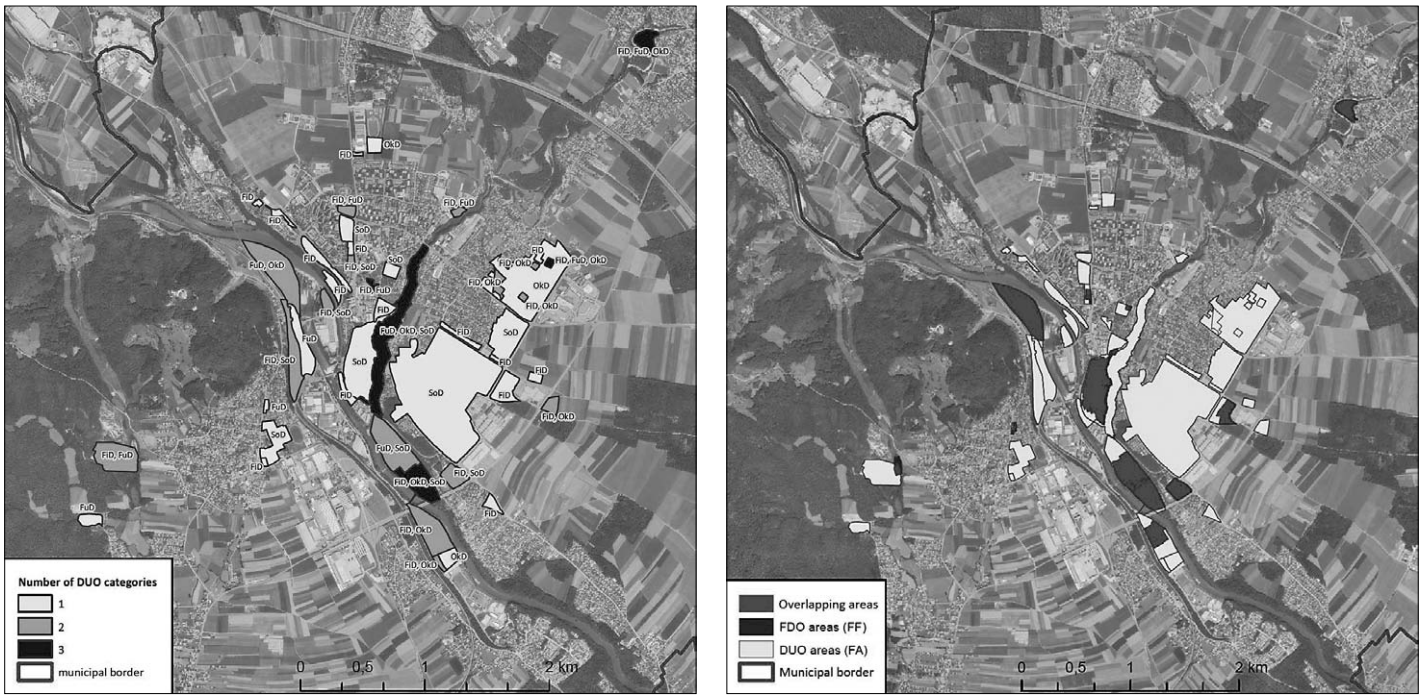


Fig. 4 The inventory according to the FA methodology in the city of Kranj. Some areas appear in different categories, up to three. The corresponding categories are listed next to each area. One notes that this inventory covers more areas than the MGRT inventory, with a much larger total area.
Sl. 4. Popis prema FA metodologiji u gradu Kranju. Neka se područja pojavljuju u različitim kategorijama, do tri odgovarajuće kategorije upisane su uz svako područje. Ovaj popis pokriva više područja nego popis MGRT-a, sa znatno većom ukupnom površinom.

Fig. 5 Comparison of brownfield areas detected by the MOP study and MGRT study
Sl. 5. Usporedba *BROWNFIELD* lokacija identificiranih u projektima MOP-a i MGRT-a

pected areas of social and environmental degradation.

This difference reflects the objectives of each ministry where the MGRT was following the interest of attracting direct (economic) investments into brownfields while the MOP was pursuing its main motive of reporting as required to the EU about the effectiveness of the EU funds' investments.[55] However, the goal of more sustainable spatial development in Slovenia in prioritising brownfield developments over greenfield developments was also clearly visible in the MOP research project's objectives.

• Types of degradation – The inventory methodology in the MGRT research project identified two main capture and three supplementary criteria: abandonment rate and minimum size of the area; physical degradation criterion, social degradation criterion and environmental degradation criterion. For some types of FDOs (functional degraded areas), the "special criterion" representing the criterion of the time of abandonment (FDO of transitional/temporary use) was added.

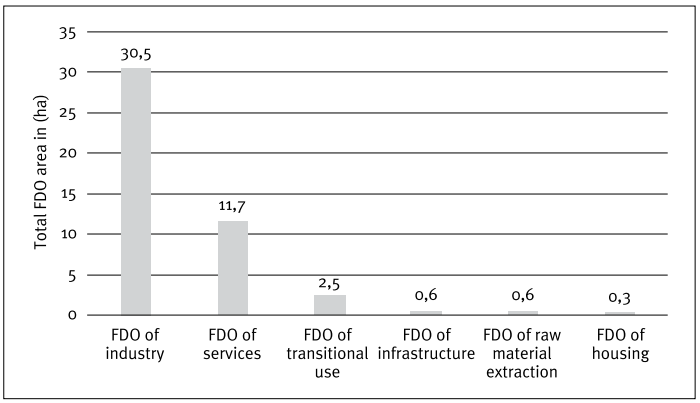
The MOP research project's inventory methodology used slightly different criteria (defining the type of degradation): functional degradation [FuD], physical degradation [FiD], social degradation [SoD], environmental degradation [OkD], and area size as a baseline criterion (see Fig. 4).

When defining the type of degradation, good alignment of the two methodologies can be noticed although a clear preference is given in the MGRT study to the level of abandonment, i.e. functional degradation. New criteria were added to the MGRT study in a later phase precisely to ensure better harmonisation of the two methodological approaches. In both methodologies, the criteria social and environmental degradation are merely at the level of detected suspicion. The criterion of transitional/temporary use is an integral part of the functional degradation criterion in the MOP study.

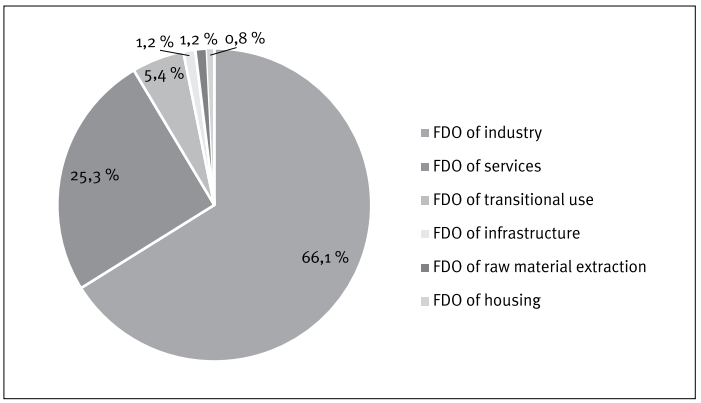
• Minimum size of the inventory area – The MOP project tried to follow the boundaries of Spatial Planning Units (*Enote urejanja prostora* – EuP) e.g. zones in spatial planning documents with similar spatial planning rules. If that proved impossible, clusters of land parcels located within the area of settlements were relied on. The MGRT research project did not have such a restriction. Instead, the area was delimited by the area of degradation as perceived by the authors (Fig. 3). The MGRT inventory thus also covers the increasingly pressing issue of peri-urban areas. Both research projects defined 2,000 m² as the minimum area size to be included in the inventory. The MGRT study also establishes a limit on brownfields outside cities and urban settlements of more than 5,000 m².

• Types of degraded areas/brownfields – In further defining types of brownfield sites, both research projects used the official Rules

54 Koželj et al., 2016
55 Cotić et al., 2017



Graph. I FDO shares [in ha]
Graf. I. FDO [u ha]



Graph. II FDO shares [in %]
Graf. II. FDO [u %]

on the content, form and manner of preparing the municipal spatial plan.[56] Article 15 of these Rules defines the basic and detailed classification of land use types (e.g. residential, agricultural, infrastructure). The two research projects considered that the types of brownfield sites [NERUO, FDO] should follow the land-use type of previous use. The Rules from 2007 defined 20 types of land use. Based on these, the MOP study identified ten relevant types of NERUO, while the MGRT study identified nine major types of FDOs, five of which had subtypes. A total of 19 different FDO types were defined. Differences exist between the Rules and the MOP research project's classification in Type D Tourism and Recreation Area, Type F Infrastructure Area (that combines several types of infrastructure), Type H of the Agricultural Production Area, defined in the Rules as "agricultural areas" and Type J Areas of Transitional Passive Use.

The comparison shows (see Table I) the differences between the Rules and the MGRT research project's classification are bigger than with the MOP research project. A prominent difference is the definition of FDO service activities, which includes the FDO of old city centres as a subtype.

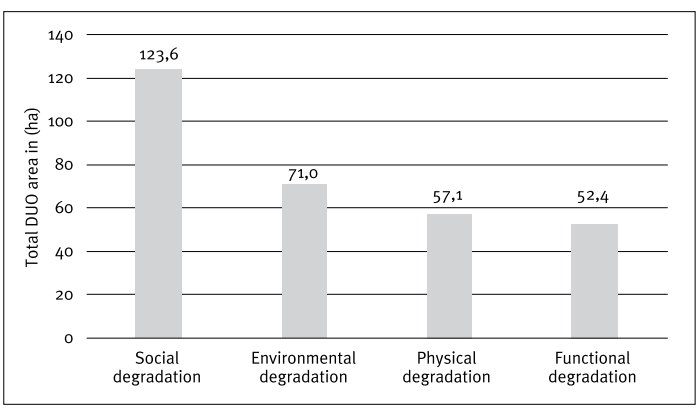
In the City Municipality of Kranj, the MGRT project detected 13 FDOs. In total, the area of FDOs in the City of Kranj encompasses 46.17 ha (Graph 1). The largest share is represented by FDO of industrial and craft activities, 66.1% (30.5 ha), followed by FDO of service activities with 25.3% (11.7 ha; Graph 2). Other categories appear less frequently (Fig 2).

The MOP research project detected more NERUOs than the MGRT research project did. In the City of Kranj, 72 areas with a total area of 304.08 ha were identified (Fig. 4, Graph 3).

Besides the number of brownfield sites, the boundaries of certain sites differ. It is interesting that the most common type of NERUO in the City of Kranj is areas with suspected social degradation, in total representing 123.60 ha (Graph 3) or 40.7% of the entire area of NERUOs (Graph 4). The MOP project identified certain areas several times, namely one for every typology. Taking this fact into consideration, a total of 47 unique areas was identified. This fact is problematic from the aspect of the database's structure since one area can be included several times.

In addition, we noticed some irregularities in the topology of the NERUO data (MOP project). In some areas, they do not fully connect or overlap with each other. The total area of brownfields is then 206.36 ha.

Graph. III NERUO shares [in ha]
Graf. III. NERUO [u ha]



Graph. IV NERUO shares [in %]
Graf. IV. NERUO [u %]

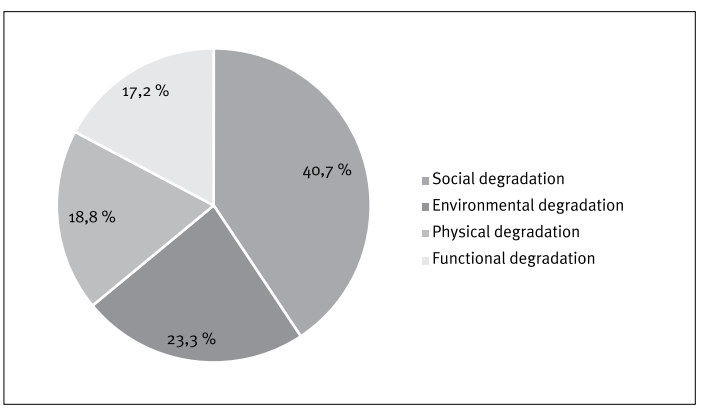


Table I Comparison of the MGRT and MOP studies on brownfield sites inventory
Tabl. I. Usporedba projekata MGRT-a i MOP-a s obzirom na popis *BROWNFIELD* lokacija

Analysed parameters / Methodology	MGRT inventory	MOP Inventory
Main objective/scope of the inventory	Focus on functionally degraded areas as areas with the greatest potential for (economic) redevelopment	Focus on unused or underused areas within settlements for their sustainable regeneration
The definition of a base unit (brownfield definition)	FDO is an underutilised or abandoned area with a visible impact of prior use and reduced usefulness and may hold potential for redevelopment. FDOs can be activated by sectorally harmonised regulations and measures for renovation and reactivation or can be restored (with certain measures) to the state it was in before the activity was carried out.	– NERUO is an area whose use can become more economical and efficient through various measures like renovation, redevelopment, introduction of new uses and activities, thereby supporting sustainable development
Types of degradation	– Criterion of the abandonment rate (as the second main criterion), – Criterion of physical degradation – Criterion of (suspected) social degradation [SoD] – Criterion of (suspected) environmental degradation (OkD) – Timeframe criterion (temporary use)	– Criterion of functional degradation [FuD] – Criterion of physical degradation [FiD] – Criterion of (suspected) social degradation [SoD] – Criterion of (suspected) environmental degradation criterion [OkD]
The minimum size of the inventory area	More than 2,000 m² More than 5,000 m² outside urban settlements	More than 2,000 m²
Types of degraded areas/brownfields	Based on the official "Rules on the content, form and manner of preparing the municipal spatial plan", land use types associated with prior use 9 major types, some with subtypes; overall, 19 different FDOs: – of Agriculture – of Services (subdivided into public services, business and shopping services and historic city (village) centres – of Tourism/recreation – of Industry/production – of Military/defence – of Mining (subdivided into mining, quarries/sand pits, gravel pits and others) – of infrastructure (subdivided into traffic, environmental, other public inf. and green inf.) – of transitional use (subdivided into abandoned construction sites and other) – of Housing/residential (subdivided into unfinished residential areas and old decaying residential)	On the basis of official "Rules on the content, form and manner of preparing the municipal spatial plan", land use types associated with prior use 10 types of NERUO: – of Housing/residential – of Central/mixed use – of Industry/production – of Tourism/recreation – of Green areas – of Infrastructure – of Military/defence – of Agriculture – of Mining – of Transitional use

The total area of sites overlapping in both inventories is 43.5 ha (Fig. 5), only slightly smaller than the total area of areas detected with the MGRT project's methodology (46.2 ha; Fig. 2). It is interesting that the MOP project's methodology did not detect the "Gramoznica Gradbinec" area and part of the Laze business zone. Some minor differences in other areas were also found, but these were mainly due to a different area boundary.

Put more simply, the MGRT project objectives were based on a more vertical, sectoral (silos) view, while the MOP project objectives relied more on a horizontal and integrative approach with all sectors and levels in the spatial planning process in mind.

While analysing the results of the two methodologies, we must also consider the subjectivity of the experts involved in the evaluation process since such tasks are never fully automated, but constitute an expert's judgement in line with the defined criteria. This is especially true, correct and justified with respect to qualitative criteria. The final decision to identify a particular location as a brownfield (FDO or NERUO) is also a matter of judgment in the context of the surrounding and other factors (location, ownership structure, political decisions) that might have an influence.

The results of the two projects allow us to describe the MOP inventory as 'spatial planning' oriented and the MGRT inventory as more 'business' oriented. Still, it is important to emphasise that both methodologies are well designed and in line with the latest findings concerned with brownfield regeneration.

The present study shows that while drawing up a brownfield inventory, several aspects must be kept in mind: find out what brownfields mean in the geographical area of a region, county or state; develop a methodology for a specific brownfield inventory as there is no standard and universally applicable method for identifying brownfields[57]; and draw attention to the size of brownfields and different/same inventories for different/same sizes.

• Proposed guidelines for combining two methodologies to form one – A critical evaluation of the two methods reveals the advan-

56 *** 2007. See: http://www.pisrs.si/Pis.web/pregledPredpisa?id=PRAV8106 [21.11.2019].

57 Heberle, Wernstedt, 2006

Table II List of selected topics as a basis for the proposed new methodology for an inventory of brownfield sites

Tabl. II. Popis izabranih tema kao osnova predložene nove metodologije za izradu popisa *brownfield* lokacija

	MOP inventory	MGRT inventory	Selected study as basis for the new methodology	Explanation for the selected study
Area boundary	Follows the land cadastre and, if possible, spatial planning units [EUP]	Delimited by the area of degradation as perceived by authors	MOP inventory	To create a register and not just an inventory
Types of degraded areas/brownfields	Follows almost entirely the official Rules on the content, form and manner of preparing the municipal spatial plan	Follows to some extent the official Rules on the content, form and manner of preparing the municipal spatial plan	MOP inventory	To allow compatibility with the Municipal Spatial plan
Analysed area	Settlement areas only	Entire municipality	MGRT inventory	To cover the total area of the municipality
GIS Topology	Some areas are covered with multiple layers	Each area is covered with one layer	MGRT inventory	To ensure a clear GIS topology, different characteristics should be handled as attributes

tages/disadvantages of the two approaches and may be seen as the first step towards defining criteria for a new, upgraded methodology (see Table II).

Following the selected topic on the minimum size of the inventory area and the delimitation of brownfield land, we propose relying on the MOP study approach, which is based on the cadastral boundaries and, if possible, on the boundaries of spatial planning units (*Enota urejanja prostora* – EUP). Since the cadastral data are linked to the land register (ownership data), we consider this approach to be mandatory given that not only is an inventory produced, but also a brownfield register as the final goal.

In classifying types of brownfield sites (also in relation to their previous land use), the MOP approach is more consistent with the "official rules on the content, form and method of drawing up the municipal spatial plan". This allows for the better integration of the brownfields issue in the spatial planning process. All brownfields areas must be covered in the inventory (like in the MGTR research project), and not simply those in settlement areas (as in the MOP research project where some brownfields in peri-urban or rural areas are missing).

It is better to follow the MGRT methodology while preparing one inventory methodology, taking the structure of the database (topology) into account, as each area is listed only once and there are no multilayer zones. In a GIS database, different characteristics should only be treated as additional GIS attributes.

The integrative method of providing information on environmental pollution (pollution of soil and water with waste, sewage, toxic emissions and other pollutants) and/or social degradation (presence of vandalism, damage to buildings, reduced security, above-average crime rate, bad reputation, ageing population, ghettoisation and others) would be a common collection point not only for inventory studies or data, but for data already collected by several sectors and institutions.[58] Such an approach to various aspects of environmental and/or social degradation could enable solid criteria for defining brownfield sites that take account of these problems to be established.

The inventory of brownfields is also part of the spatial information system available to investors when they decide on investment and the regeneration of brownfields. Planners and policymakers need to know the extent of a city's brownfield problem before they are able to create effective policies and legislation for regeneration and before developers and municipalities make large financial investments.[59] A brownfield inventory is used to develop a clear vision of new uses and functions of a regenerated area.

Conclusions

Zaključci

It is important to provide municipalities with a tool for managing and regenerating brownfield sites and to prevent brownfield sites and surrounding areas becoming neglected. A brownfield inventory also means drawing up a profile of brownfield sites: confirming the status of land as brownfield sites with further investigations (i.e. file research, site inspections etc.) and examining individual brownfields in relation to the city region as a whole.

Apart from applying a standardised methodology for the inventory of brownfield sites,

58 Mujkić et al., 2017
59 Hayek et al., 2010

the results and data should be reviewed and commented on by landowners and the general public. This process could form an integral part of the planning of the Municipal Spatial Plan (especially for public consultations). In this way, the new inventory could strengthen its role as an official register and obtain a legal background. One consequence might be greater co-financing for brownfield regeneration by public authorities. The new register should also enable landowners to decide whether or not their property is to be included in the publicly available online list as brownfield land.

We also propose that before a new methodology and new register are prepared, municipalities should be free to choose the methodology they wish to apply so as to suit their needs with regard to the development visions held by the municipality (region).

[Written in English by the authors, proof-read by Murray Bates]

Bibliography

Literatura

1. Alker, S.; Joy, V.; Roberts, P.; Smith, N. (2000), *The definition of brownfield*, "Journal of Environmental Planning and Management", 43 (1): 49-69; https://doi.org/10.1080/09640560010766
2. Cotič, B.; Bizjak, I.; Nikšič, M.; Koblar, S.; Mušič, B. (2017), *Povezava nalog, ki obravnavata degradirana območja, opredelitev do izdelanih metodologij in oblikovanje predloga rešitve, zaključno poročilo,* Urbanistični inštitut Republike Slovenije, Ljubljana
3. Čelik, M. (2008), *Industrijska degradirana urbana območja v ožjem območju Mestne občine Kranj,* Jereb Budja arhitekti, Kranj
4. De Sousa, C. (2017), *Trying to Smart-In-Up and Cleanup Our Act by Linking Regional Growth Planning, Brownfields Remediation and Urban Infill in Southern Ontario Cities,* "Urban Planning", 3: 5-17; https://doi.org/10.17645/up.v2i3.1026
5. Dimitrovska, A.; Mihelič, B.; Stanić, I. (2001), *Razpoznavna struktura mesta: Primer Ljubljane,* "Urbani izziv", 12 (2): 5-16, 117-123, Ljubljana; https://www-jstor-org.nukweb.nuk.uni-lj.si/stable/44180365; https://doi.org/10.5379/urbani-izziv-2001-12-02-001
6. Ferber, U. [ed.] (2006), *Brownfields handbook*, LEBOP, Leonardo da Vinci pilot project: 94 p., Ostrava; http://fast10.vsb.cz/lepob/index1/handbook_eng_screen.pdf
7. Frickell, S.; Elliot, J.R. (2008), *Tracking Industrial Land Use Conversions: A New Approach for Studying Relict Waste and Urban Development,* "Organization & Environment", 21 (2): 128-147; https://doi.org/10.1177/1086026608317799
8. Garb, Y.; Jackson, J. (2011), *Brownfields in the Czech Republic, 1989-2009: The long path to integrated land management,* Henry Stewart Publications, "Journal of Urban Regeneration and Renewal", 3 (3): 263-276 London
9. Hayek, M.; Novak, M.; Arku, G.; Gilliland, J. (2010), *Mapping Industrial Legacies: Building a Comprehensive Brownfield Database in Geographic Information Systems*, "Planning Practice & Research", 25 (4): 461-475; https://doi.org/10.1080/02697459.2010.511018
10. Heasman, I.; Westcott, F.; Connell, P.; Visser-Westerweele, E.L.; Mackay, S. (2011), *Environmental Liability Transfer in Europe: Divestment of Contaminated Land for Brownfield Regeneration,* NICOLE Brownfield Working Group Report, Rotterdam; http://www.nicole.org/uploadedfiles/2011-wg-brownfields-finalreport.pdf
11. Heberle, L.; Wernstedt, K. (2006), *Understanding brownfields regeneration in the US,* "Local Environment", 11 (5): 479-497; https://doi.org/10.1080/13549830600853064
12. Ilík, J.; Bergatt Jackson, J. (2006), *Dobrodružství kocoura Brownfielda: kocour Brownfield*

Sources

Izvori

přináší nové příležitosti našim městům a obcím, IURS, Ostrava

13. Koželj, J.; Ažman Momirski, L.; Maligoj, T.; Omerzu, B. (1998), *Degradirana urbana območja,* Ministrstvo za okolje in prostor, Urad RS za prostorsko planiranje, Ljubljana
14. Koželj, J.; Filipič, P; Hočevar, P.; Strle, K.; Kušar, K. (2016), *Merila in kriteriji za določitev degradiranih urbanih območij (DUO2) z nadgradnjo: Določitev nerevitaliziranih urbanih območij (NERUO),* Fakulteta za arhitekturo, Katedra za urbanizem, Ljubljana
15. Lampič, B.; Mator, N.; Gamse, M.; Jenko, I.; Kljun, U. (2015), *Vzpostavitev aktivnega registra prostorsko in funkcionalno degradiranih območij za Gorenjsko regijo: končno poročilo,* Oddelek za geografijo Filozofske fakultete, Oddelek za krajinsko arhitekturo Biotehniške fakultete, Ljubljana
16. Lampič, B.; Cigal, D.; Kušar, S.; Krevs, M.; Potočnik Slavič, I.; Zavodnik Lamovšek, A.; Foški, M.; Soss, K.; Simoneti, M.; Radovan, D.; Meža, S.; Barborič, B. (2017), *V6-1510 Celovita metodologija za popis in analizo degradiranih območij, izvedba pilotnega popisa in vzpostavitev ažurnega registra : končno poročilo,* Filozofska fakulteta, Univerza v Ljubljani, Ljubljana
17. Lampič, B.; Bobovnik, N. (2017), *Dodatni popis funkcionalno degradiranih območij v petih statističnih regijah (Osrednjeslovenska, Savinjska, Primorsko-notranjska, Obalno-kraška, Koroška): metodologija CRP 2015: končno poročilo,* Filozofska fakulteta, Oddelek za geografijo, Ljubljana
18. Limasset, E.; Pizzol, L.; Marly, C.; Gatchett, A.M.; Le Guern, C.; Matrinat, S.; Klusaček, P.; Bartke, S. (2018), *Points of attention in designing tools for regional brownfield prioritization,* "Science of the Total Environment", 622-623: 997-1008; https://doi.org/10.1016/j.scitotenv.2017.11.168
19. Matković, I.; Jakovčić, M. (2019), *Brownfield prostori i njihova regeneracija; Definicije i pristupi,* "Prostor", 27 (2 /58/): 348-359, Zagreb; https://doi.org/10.31522/p.27.2(58).13
20. Mehdipour, A.; Nia, H.R. (2013), *The role of brownfield development in sustainable urban regeneration,* "Journal of Sustainable Development Studies", 4 (2): 78-87
21. Mujkić, S.; Kajapi, L.; Bizjak, I.; Nikšič, M.; Vodeb, V.; Goršič, N.; Tominc, B. (2017), *Priprava strokovnega gradiva za določitev meril in kriterijev socialne degradacije urbanih območij,* Urbanistični inštitut Republike Slovenije, Ljubljana
22. Mušič, B.; Cotić, B. (2012), *Brownfield regeneration management: From education to practice,* final Brochure of the project INTERREG Central Europe COBRAMAN, Urbanistični inštitut Republike Slovenije, Ljubljana
23. Noviks, G.; Teirumnieks, E.; Lemešenoka, N.; Matisovs, I.; Teirumnieka, E.; Miklašēvičs, Z. (2009), *Evaluation of brownfields in Latvia*, Environment. Technology. Resources Proceedings of the 7th International Scientific and Practical Conference, Volume 1, Rēzeknes Augstskola, Rēzekne, RA Izdevniecība; https://doi.org/10.17770/etr2009vol1.1112
24. Oliver, L.; Ferber, U.; Grimski, D.; Millar, K.; Nathanail, P. (2005), *The Scale and Nature of European Brownfield,* project CABERNET, Nottingham
25. Otsuka, N.; Dixon, T.; Abe, H. (2013), *Stock measurement and regeneration policy approaches to 'hardcore' brownfield sites: England and Japan compared*, "Land Use Policy", 33: 36-41; https://doi.org/10.1016/j.landusepol.2012.12.002
26. Rizzo, E.; Pizzol, L.; Zabeo, A.; Giubilato, E.; Critto, A.; Cosmo, L.; Marcomini, A. (2018), *An Information System for Brownfield Regeneration: providing customised information according to stakeholders' characteristics and needs*, "Journal of Environmental Management", 217: 144-156; https://doi.org/10.1016/j.jenvman.2018.03.059
27. Sroka, B. (2019), *Specificity of Brownfield's Revitalisation in Polish Legal Framework: Discussion On Current Legislature Problems Based On Case Study,* "IOP Conf. Series: Materials Science and Engineering", 471; https://doi.org/10.1088/1757-899X/471/7/072049
28. Špes, M.; Krevs, M.; Lampič, B.; Mrak, I.; Ogrin, M. (2012), *Sonaravna sanacija okoljskih bremen kot trajnostno razvojna priložnost Slovenije, Degradirana območja, Ciljni raziskovalni program (CRP) "Konkurenčnost Slovenije 2006-2013": zaključno poročilo,* Oddelek za geografijo Filozofske fakultete Univerze v Ljubljani, Ljubljana
29. Yount, K.R. (2017), *What Are Brownfields? Finding a Conceptual Definition,* "Environmental Practice", 25-33; https://doi.org/10.1017/S1466046603030114
30. *** (2006), *Zakon o varstvu okolja,* "Uradni list Republike Slovenije", uradno prečiščeno besedilo, 39/2006, Ljubljana
31. *** (2007), *Pravilnik o vsebini, obliki in načinu priprave občinskega podrobnega prostorskega načrta*, "Uradni list Republike Slovenije", 99/2007, Ljubljana
32. *** (2017), *Zakon o urejanju prostora*, "Uradni list Republike Slovenije", 61/2017, Ljubljana

Internet Sources

Internetski izvori

1. https://www.researchgate.net/publication/228789048_The_Scale_and_Nature_of_European_Brownfield [27.1.2020.]
2. http://www.eugris.info/DisplayProject.asp?ProjectID=4420 [5.12.2019.]
3. http://www.eugris.info/displayproject.asp?Projectid=4575 [5.12.2019.]
4. http://www.eugris.info/displayproject.asp?Projectid=4509 [5.12.2019.]
5. http://cobraman.uirs.si [5.12.2019.]
6. www.zerobrownfields.eu [5.12.2019.]
7. http://www.timbre-project.eu/timbre-project.html [23.1.2020.]
8. https://www.uradni-list.si/glasilo-uradni-list-rs/vsebina/2017-01-2915 [1.6.2019]
9. http://www.southeast-europe.net/document.cmt?id=457 [5.12.2019.]
10. http://www.southeast-europe.net/en/projects/approved_projects/?id=94 [5.12.2019.]
11. https://www.gov.uk/government/collections/national-land-use-database-of-previously-developed-land-nlud-pdl [5.12.2019.]
12. https://www.gov.uk/guidance/brownfield-land-registers [5.12.2019.]
13. http://www.legislation.gov.uk/uksi/2017/403/contents/made [5.12.2019.]
14. http://www.epa.gov/brownfields/ [5.12.2019.]
15. https://www.spiritslovenia.si/ [5.12.2019.]
16. https://brownfieldy-dotace.czechinvest.org/Aplikace/bf-public-x.nsf/bfs.xsp [5.12.2019.]
17. http://www.bsc-kranj.si/ [7.12.2019.]
18. http://www.pisrs.si/Pis.web/pregledPredpisa?id=PRAV8106 [21.11.2019.]

Illustration Sources

Izvori ilustracija

Fig. 1 Hieng, Primož, 2009 (copyright by the City of Kranj)
Fig. 2 Cotić, Koblar, 2017 (data source: MGRT Study)
Fig. 3 Cotić, Koblar, 2017 (data source: MGRT Study)
Fig. 4 Cotić, Koblar, 2017 (data source: MOP Study)
Fig. 5 Cotić, Koblar, 2017 (data source: MOP Study and MGRT Study)
Graph 1 Koblar, 2017 (data source: MGRT Study)
Graph 2 Koblar, 2017 (data source: MGRT Study)
Graph 3 Koblar, 2017 (data source: MOP Study)
Graph 4 Koblar, 2017 (data source: MOP Study)
Table I Authors, 2020 (based on MOP Study and MGRT Study)
Table II Authors, 2020 (based on MOP Study and MGRT Study)

Summary

Sažetak

Popis *brownfield* lokacija u Sloveniji: prema novoj metodologiji

Pojavljivanje *brownfield* lokacija kontinuirani je urbani proces. U Sloveniji su te lokacije uglavnom nastale kao posljedica napuštanja industrijskih aktivnosti i vojarni u urbanim centrima te njihova premještanja na periferije naselja. Postoji samo nekoliko primjera iznimno zagađenih *brownfield* lokacija u Sloveniji. No, u Sloveniji ima i nekoliko primjera uspješnih obnova takvih lokacija, unatoć tome što ne postoji sustavni pristup njihovoj revitalizaciji. Prije nego što se pristupi rješavanju problema koji se odnose na same *brownfield* lokacije i pokretanju postupaka obnove, važno je definirati što je to *brownfield* lokacija te provesti postupak njihove inventarizacije kako bi se utvrdilo koliko takvih lokacija uopće ima, kolika je njihova veličina i trenutačno stanje. Pristupi definiranju *brownfield* lokacija, pristupi utvrđivanju kriterija za njihovo definiranje, kao i pristupi njihovoj inventarizaciji, razlikuju se u raznim državama. Definicije *brownfield* lokacija mogu se pronaći u raznim prostornim dokumentima, kao što je Zakon o prostornom planiranju Slovenije, gdje se koristi pojam 'devalvirano područje' (područje smanjenje vrijednosti), kojeg je značenje vrlo slično engleskom pojmu *brownfield* koji se koristi u Velikoj Britaniji i Irskoj. Velika Britanija čuva specijalizirane zemljišne knjige *brownfield* lokacija, utemeljene u zakonu iz 2017. godine koji zahtijeva od svih tijela što sudjeluju u planiraju da pripreme popis *brownfield* lokacija na temelju jedinstvene metodologije. U Sloveniji je bilo nekoliko pokušaja inventarizacije *brownfield* lokacija još 1998. godine na osnovi analize glavnih tipova *brownfield* lokacija u 33 slovenske općine. U sklopu Cobraman projekta provedena je inventarizacija *brownfield* lokacija u užem području Gradske općine Kranj s 10 prioritetnih lokacija. Prva sustavna inventarizacija *brownfield* lokacija u cijeloj Sloveniji pripremana je između 2010. i 2012. Usto, autori su također osmislili sustav baze podataka, no zapisi su ostali nepotpuni jer su prikupljena samo područja veća od 1 hektara.
Metodologija iz 2012. usavršena je 2015. za svih 18 općina Gorenjske regije. Definirano je 10 različitih vrsta funkcionalno degradiranih područja. Najnovijim istraživačkim projektima Ministarstva gospodarskog razvoja i tehnologije ([MGRT] te Ministarstva za okoliš i prostorno planiranje [MOP] u razdoblju između 2015. i 2017. godine pripremljen je kvalitetan i cjelokupan popis *brownfield* lokacija u Sloveniji (projektom MGRT-a pripremljen je popis za cjelokupno područje Slovenije, dok je projekt MOP-a pokrio tek 11 gradskih općina u Sloveniji). Ti su projekti provedeni na osnovi različitih metodologija i polazišta. Cilj je ovoga istraživanja analizirati razlike i sličnosti u dvama metodološkim pristupima, kao i rezultate istraživanja MGRT-a i MOP-a, te definirati smjernice za buduću središnju metodologiju za inventarizaciju *brownfield* lokacija. Ključna razlika u dvama popisima proizlazi iz njihove različite definicije *brownfield* lokacije te različitih obuhvata i ciljeva.
Oba istraživačka projekta potvrđuju minimalnu veličinu površine od 2000 m² kao kriterij na temelju kojeg se neka lokacija unosi u popis. Projekt MOP-a pokušao je slijediti granice prostornoplanskih jedinica, tj. zona u dokumentima prostornog planiranja sa sličnim pravilima prostornog planiranja. Projekt MGRT-a nije imao takve restrikcije, već je umjesto toga područje ograničeno područjem degradacije kako ga percipiraju autori. U definiranju tipologija *brownfield* lokacija obje su studije koristile službena Pravila o sadržaju, formi i načinu pripreme općinskoga prostornog plana. Usporedba pokazuje da su razlike između Pravila i klasifikacije istraživačkog projekta MGRT-a veće nego kod istraživačkog projekta MOP-a.
Ciljevi projekta MGRT-a temelje se na vertikalnomu sektorskom pristupu, a ciljevi projekta MOP-a temelje se na horizontalnomu integriranom pristupu koji vodi računa o svim sektorima i razinama u procesu prostornog planiranja. Rezultati obaju projekata pokazuju da je popis MOP-a više orijentiran prostornoplanski, dok je popis MGRT-a više poslovno orijentiran. Stoga se metodologije iz obaju projekata ne mogu kombinirati kako bi se došlo do jedne jedinstvene centralne metodologije za inventarizaciju *brownfield* lokacija. Ipak, polazeći od rezultata ovih istraživanja, moguće je ustanoviti preporuke za buduću metodologiju inventarizacije *brownfield* lokacija. Definiranjem minimalne površine područja, ograničavanjem *brownfield* zemljišta i klasificiranjem tipova *brownfield* lokacija – istraživački projekt MOP-a predstavlja solidnu osnovu. Bolje je slijediti metodologiju projekta MGRT-a, s obzirom na strukturu njegove baze podataka (topologiju), jer je svako područje navedeno samo jednom i nema višeslojnih zona. Popis *brownfield* lokacija također je i dio prostornoga informacijskog sustava.
Planeri i kreatori politika moraju imati uvid u opseg problema *brownfield* lokacije u nekome gradu prije nego pristupe kreiranju učinkovitih strategija i zakonodavnog okvira za njihovu revitalizaciju, te prije nego što 'developeri' i općine ulože znatna financijska sredstva. Rezultati i podatci svakoga novog registra moraju se revidirati i prodiskutirati s vlasnicima zemljišta i javnošću. Taj bi proces mogao postati integralni dio pripreme Općinskoga prostornog plana (osobito za javne konzultacije). Na taj bi način novi popis mogao postati službeni registar i dobiti zakonodavnu podlogu. Novi popis *brownfield* lokacija trebao bi također pomoći vlasnicima zemljišta u odluci o tome treba li njihova imovina biti na javno dostupnoj online listi zavedena kao *brownfield* zemljište.

Biographies

Biografije

Boštjan Cotič is an architect and urban planner and had led several EU-funded projects focused mainly on urban planning and brownfield regeneration processes. He was the president of the *Town and Spatial* Planning *Association* of Slovenia (2012-2014).
Lucija Ažman Momirski, Ph.D., is an architect and urban planner. She has received several first prizes and awards in national and international architectural and urban design competitions and led several international research and professional projects.

Boštjan Cotič, arhitekt i urbanist. Vodio je nekoliko projekata financiranih iz EU fondova koji se bave urbanizmom i procesima revitalizacije *brownfield* lokacija. U razdoblju od 2012. do 2014. bio je predsjednik Saveza za prostorno planiranje Slovenije.
Dr.sc. **Lucija Ažman Momirski**, arhitektica i urbanistica. Dobitnica je nekoliko prvih nagrada na državnim i međunarodnim arhitektonskim i urbanističkim natječajima. Vodila je nekoliko međunarodnih istraživačkih i stručnih projekata.