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**RUSTY HUNGARY: NEW INSIGHTS
IN BROWNFIELD RESEARCH**

Abstract. Spatial development and planning in Hungary bear the marks of the post-socialist transformation. This is also observed in the handling of brownfields which, in the wake of political changes, increased in large numbers. In recent years a lot has happened, but we still know far too little about these areas. The paper focuses on the assessment of the extent of brownfields, their properties and regeneration in Hungary. The survey was based on collection of existing and accessible data at national and regional level, complemented by two personal databases. The study extends beyond the spatial dimension of brownfield sites. The results also emphasize further contexts of brownfield management that are not easily perceptible.

Key words: brownfield regeneration, Hungary, real extent, second generation brownfields.

1. INTRODUCTION

The post-socialist transformation created some challenges in Hungary that had never been anticipated before. Functions had suddenly become obsolete after decades of expansion. This was due to the structural transformation of economy and the demilitarisation of spacious areas of thousands of square kilometres. Brownfield was an unexpected and literally unknown category in the country: ideologically determined continuous economic growth excluded the possibility of recession, and the overall shortage of fixed capital made abandoning of industrial sites highly improbable. Although there were some cases with depleted mines, closed

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railway lines or even barracks, the key players of local and regional development and planning did not have the crucial experience for recognising and handling brownfields. The deep recession and overall social crisis in the early 1990s allowed little regard to the questions of sustainable land use (Orosz and Pirisi, 2014).

The attention of Hungarian academics and professionals turned to the topic years after the political changes, and the research conducted since is still at an early stage. From the early years of this millennium, surveys from an urban geographical point of view have been conducted on brownfields and their regeneration, especially in Budapest; therefore, we have a detailed picture about the rust belt(s) of the Hungarian capital city, including its genesis, structure, condition and development potential (see Barta, 2002a, 2004; Barta *et al.*, 2006; Kukely *et al.*, 2006; Kiss, 2009).

Considerably less papers were published on brownfields in other settlements in Hungary, and these only focus on the traditional types¹ and forms of brownfields. Beyond the overall transformation of the industry and its spatial consequences for the local level (see Barta, 2002b; Berki, 2014; Kiss, 2010) there are some detailed analyses on industrial brownfields in cities like Miskolc–Diósgyőr (Dobák, 2013), Sopron (Jankó and Bertalan, 2009) or Pécs (Varjú, 2008; Trócsányi, 2011). Among the other functional types, the special problems of former military sites are given priority (see Kádár and Kozma, 2011; Mohos and Garda, 2009; Orosz and Pirisi, 2014).

Although cities are most popular concerning the level of surveys, there are also some, but very few publications at the administrative level of counties (NUTS 3). Remarkable among them is the paper of Horváth *et al.* (2002) which describes and analyses the rustbelt of Borsod-Abaúj-Zemplén county, which is dominated by former sites of heavy industry. The paper focuses on the specialities of decontamination, redevelopment, and the legal background behind these issues.

Besides the papers cited above and some comprehensive studies (which we will cover later in this paper), the articles published on these topics represent only relatively narrow slices of the complex questions of brownfields, for example focusing only on the social and economic framework (Hegy-Kéri, 2014, Roncz and Tóthné Szita, 2012) or on one specific sector (Csapó and Pintér, 2015).

There are only restricted possibilities for the research of brownfields due to the lack of a national (or even local) level cadastre of such territories (there are not even concrete plans or political decision about it). Therefore, even researchers have no accurate picture of the number, dimension and other attributes of these areas, although there were notable efforts made in the field of mapping and surveying them.

In this paper, we try to provide an overview of the brownfield situation in Hungary based on different databases. The aim of the study is to investigate brownfields in

¹ We distinguish between three types of brownfields based on the former use of the area: the traditional (former industrial, military and transportation areas), the transitional (former commercial, residential and other technical infrastructure areas) and the new type of brownfields (former social and cultural function) (Orosz, 2012).

terms of their number, extent, spatial distribution and other characteristics that affect regeneration. The basis was existing and accessible brownfield databases at national (VÁTI 2003; CES 2004) and regional level (Hőnyi, 2006; Papp *et al.*, 2006), supplemented with the results of two personal data collections at national level.

2. THE ANALYSED DATABASES

There have been some projects conducted in the last 10–15 years aiming at the creation of a database on brownfields at a national level (see Table 1). The foundation stone of all similar surveys is the so-called VÁTI-database.² Its aim was the estimation of the scale of the funding needs from the EU Structural Funds for the brownfield redevelopment in Hungary. It collects data concerning size, number and spatial distribution of industrial and military brownfields,³ thus the survey of selected local governments (see Nagy *et al.*, 2003).

Later, some more databases were created for various purposes. One of the earliest, the project of the Centre for Environmental Studies (CES)⁴ was finished in 2004. This survey only covered municipalities with town rank, so 90% of all Hungarian settlements were excluded. Similar limitation was valid for other researches like a selection of studies focusing on green- and brownfield investments of regional centres in Hungary (see Györi, 2006).

A more detailed, but spatially limited picture was taken of brownfields by the so-called ‘Northern Hungary Register’ (hereafter referred to as NHR) (Papp *et al.*, 2006) or the database annexed to a development strategy of the Southern Transdanubian region also in 2006 by the Kapos ITK⁵ (Hőnyi, 2006). This, however, – as the other one mentioned above – covers only one region, not the whole country.

The most detailed analysis is available for the capital city, Budapest. The data of VÁTI (2003) states that 34.7% of the brownfield area is located there (Nagy *et al.*, 2003, p. 37). From a researcher’s point of view, published data of the brownfields of Budapest are less useable, because they only indicate the traditional items (industrial, military and transport) and the description of these elements follows the logic of functional zones. This method highlights the extensive rust belts, but does not allow comparing these results with other surveys, because they usually provide data for objects, using addresses or bulk numbers to identify them.

² The VÁTI – formerly Institute for Urban Planning – became a semi-government organisation in the 1990’s with a wide range of responsibilities in spatial planning. Later, it was reorganised, and integrated into the ‘Competence Centre Lechner’, <http://lechnerkozpont.hu>.

³ Excepting former mining, railway and military training areas.

⁴ Founded in 1993 as ‘an independent non-profit think tank organisation’, <http://www.ktk-ces.hu/index2.html>.

⁵ Kapos Innovation and Transfer Centre.

Table 1. The most important characteristics of the brownfield surveys

Survey Name	National databases				Regional databases	
	VÁTI	CES	Municipality survey	Military brownfields	NHR	Kapos ITK
Date	2003	2004	2011	2012	2006	2006
Aim(s)	Estimation of the scale of the funding needs from the EU Structural Funds for the brownfield redevelopment in Hungary.	Estimation of the brownfield sites in Hungarian cities, the collection of experiences of good and bad practises relating to brownfield redevelopment, and the promoting of the exchange of experience.	Estimation of the brownfield sites, their characteristics and their regeneration in Hungary.	Estimation of the military land use in the late 1980s in Hungary, the fate of these areas nowadays, especially focused on the military brownfields, their characteristics and their regeneration.	Estimation of the scale of the funding needs for brownfield redevelopment in Northern Hungary under the II. National Development Plan.	Estimation of the scale of the funding needs for brownfield redevelopment in Southern Transdanubia under the II. National Development Plan.
Method(s)	Analysis of secondary data sources and in some cases (missing data) questionnaire.	Questionnaire	Questionnaire	Analysis of primary and secondary data sources, supplemented with non-conventional sources (e.g. social media).	No information.	Questionnaire, interviews and analysis of secondary data sources.
Number of brownfields	min. 229*	172	91	268	74	171
Total area of brownfields (ha)	11,732.9	3,257.9	3,448.4	12,577.3	2,285.3	3,942.1

Examined brownfield types	Former industrial (excl. mining) and military (excl. training grounds) areas.	Former industrial, military and other (areas that appear as brownfields in a special programme or plan of the town) areas.	All types of brownfields.	Former military areas (without Soviet military objects).	Former industrial and military areas.	Former industrial, commercial (incl. agriculture) and railway areas, and military barracks.
Strength(s)	The first official national brownfield survey, the most detailed data for the capital.	Public, online database, detailed description of characteristics.	It confirms the presence of all three types of brownfields in Hungary. 86% of the re-sponding settle-ments had not been surveyed before.	Profound data collection, nearly complete military brownfield database.	Detailed survey.	Detailed survey, it does not only cover traditional types of brownfields.
Weakness(es)	It examines only a segment within the traditional type of brownfields. It does not deal with the mapping of unknown areas. The description of the brownfields in Budapest follows the logic of functional zones. The database is old.	It studies only cities, but no villages. The used definition covers only the traditional type of brownfields.	Few respondents, not representative.	It studies only one area type.	Due to the region's characteristics, the survey primarily examines industrial brownfields.	It covers only one region.

*Some information is missing, because the study primarily investigates the territorial expansion of the areas.
Source: Nagy *et al.*, 2003; CES, 2004; Hónyi, 2006; Papp *et al.*, 2006; Orosz and Pirisi, 2014.

To reduce the shortage in data available, one of the authors conducted a survey on a sample basis representing the Hungarian settlement system (called the municipality-survey in the following). The survey has been conducted in 2011, when 431 Hungarian local governments⁶ and the 23 districts of Budapest were sent a questionnaire. Only 13.2% (60) of the questioned local governments responded, so the results are not suitable for an independent database, but as a sample, it is quite interesting to compare these results to the other databases. Among the local governments who responded⁷ to the questions, 52 did not appear either in the lists of the VÁTI-, or in the CES-database. Altogether, we have detailed information about 91 brownfield areas. There were questions asked not only about the number and size, but also about the future plans of the community for the designated area. Since there is no official brownfield definition in Hungary, a broad, own definition was used in the survey. Accordingly, under brownfield we mean a surface which has (largely) lost its original use and its regeneration or reclassification requires active measures due to the impacts of previous use (Orosz, 2012).

We have another survey conducted in 2012 that reveals a cross-section of the complex question of brownfields in one important section. The aim of this research (Orosz and Pirisi, 2014) was to estimate the scale of the military land use at its most intensive point (late 1980s), and the later fate of these areas during the process of an intensive demilitarisation of society and space. While analysing the handling of military brownfields, we could form some interesting new statements about the overall situation of disused lands.

Although military brownfields are significantly different from the other two traditional brownfield types (former industrial and transportation areas), it is worth dealing with them in detail. The military brownfield survey is a kind of ‘case study’ within the Hungarian brownfields.

The survey is based on non-conventional sources: the interest in military heritage of the recent past is quite high in some subcultures; therefore, some lists about former military objects were published by private persons on the internet with more than 500 entries, but very insufficient data. Every single object needed to be identified with meticulous care by analysing satellite images and field work. Some official sources about the areas abandoned and assigned to the local governments and our own collection helped to complete the database. The objects were tagged with data about size, ownership, condition, original and present functions.

⁶ Local governments in Hungary (LAU 2 units in EU-nomenclature) are highly decentralised with 3,152 units and pretty much cover the functional settlements. The target group of the survey were towns (settlements with city status according to Hungarian law), boroughs with at least 5,000 inhabitants and boroughs with less than 5,000 inhabitants that can be affected by brownfield sites according to other sources.

⁷ Of course, the authors do not think that the answering municipalities are representative, because it can be assumed that settlements facing significant challenges with brownfields were more likely to reply.

3. THE REAL SIZE OF BROWNFIELDS

If the data of all the six given surveys (see Table 1) is summarised, there is information about the presence of brownfields in 335 Hungarian settlements (incl. Budapest). Only half of the settlements are legally categorised as towns, in other words: 45.5% of the settlements in the database are villages under 5,000 inhabitants; therefore, brownfields are not a dominantly urban phenomenon in Hungary: they are also common in smaller settlements.

The analysed surveys have revealed different numbers of brownfields in each region (Table 2). The one with the abandoned military bases and areas became the most 'successful' among them, because it identified more statistical series than any other surveys; although, it only dealt with a narrow segment. The reason may be that, despite the other researches, this one had the goal of completely mapping the targeted sphere (while the other databases more or less focused only on the most important cases with some small limitations), and included elements like former training grounds or reserve air fields which were extensively used and have rarely been categorised as brownfields in more general researches. However, because the survey only covered brownfields (formerly) owned and managed by the Hungarian Ministry of Defence, and does not include the objects of the paramilitary border guard (controlled by the Ministry of Interior), there should be even more elements.

A similar consequence can be deduced by comparing regional surveys to national level ones. For example, in the Southern Transdanubia alone there are as many brownfields as in Hungary overall, according to the CES-database.

A more accurate picture can be drawn if the total area of brownfields is calculated (Table 2) instead of their number, because the VÁTI-database only publishes the total area of brownfields for Budapest. Differences, however, are still clearly visible. These dissimilarities can not only be interpreted with the differences in the definitions used or in the accuracy of the surveys. We can rightfully assume that *there are significantly more brownfields in Hungary than expected in the past.*

There are, however, other indirect ways to create a more accurate estimation of the overall size of brownfield areas. If we accept that the VÁTI-survey has the same accuracy rate in every region (which means that Southern Transdanubia has 9.3%⁸ and Northern Hungary has 10.8% of the total area of brownfields), and we also accept the results of the two regional surveys from 2006, we can assume a minimum of 20,000 hectares and a maximum of 40,000 hectares of brownfields in Hungary.

⁸ Before this calculation, the data for Budapest was deducted from the total area of brownfields, in order to get a more accurate result (see Table 1).

Table 2. Number and size of brownfields in regions in different databases

		Region								
		Central Hungary (HU10)	Central Transdanubia (HU21)	Western Transdanubia (HU22)	Southern Transdanubia (HU23)	Northern Hungary (HU31)	Northern Great Plain (HU32)	Southern Great Plain (HU33)	Total	
National	VÁTI	number	8*	50	30	28	31	58	229	
		area (ha)	4,720.9 (incl. Budapest: 4,073.7)	1,709.5	710.0	826.0	899.5	1,639.5	11,732.9	
	CES	number	44	14	30	6	35	23	172	
		area (ha)	832.8	796.0	468.7	96.9	527.9	436.7	3,257.9	
Regional	Municipality survey	number	24	6	25	8	18	12	104	
		area (ha)	1,001.7	1,026.2	519.6	201.0	106.1	8.1	3,448.4	
	Military brownfields	number	61	34	24	29	21	33	268	
		area (ha)	2,754.3	3,624.4	1,218.8	1,135.8	1,037.0	1,490.2	12,577.3	
Regional	NHR	number				74			74	
		area (ha)				2,285.3			2,285.3	
	Kapos ITK	number			171				171	
		area (ha)			3,942.1				3,942.1	

*The VÁTI survey for Budapest only gives data for the extension of the brownfield sites, therefore they do not appear in the table. Source: Nagy *et al.*, 2003; CES, 2004; Hönyi, 2006; Papp *et al.*, 2006; Orosz and Pirisi, 2014.

For Budapest, there is some current data available, because the recent development strategy of the capital for 2030 includes three ‘thematic programmes’, and one of these programmes focuses on brownfield developments (*Thematic Development Programme – TDP*, see TFP, 2014). According to this strategy, there are about 1,200 hectares of disused land (TFP, 2014, p. 5), based on a somewhat extended definition used by the strategy.

Formerly, our study in 2012 found 419.6 hectares of military brownfields inside the borders of Budapest. This confirms one of the basic statements of the VÁTI-survey that suggests that one third of all brownfields are military areas (see Nagy *et al.*, 2003, p. 37). If we transfer this calculation method and multiply the most reliable number of military brownfields – excluding Budapest – then we can calculate a total area of 36,000 hectares of brownfields.

This number matches the former estimation extrapolated by the regional data (20–40,000 ha), and suggests, that with relatively high probability, the total area of brownfields is, at least, two to a maximum of four times larger than assumed before.

Because of the much larger average dimension, military and industrial areas are dominating the picture. Not surprisingly, some similar big objects of traditional brownfields are appearing when we calculate the rate of penetration in each settlement (Fig. 1).

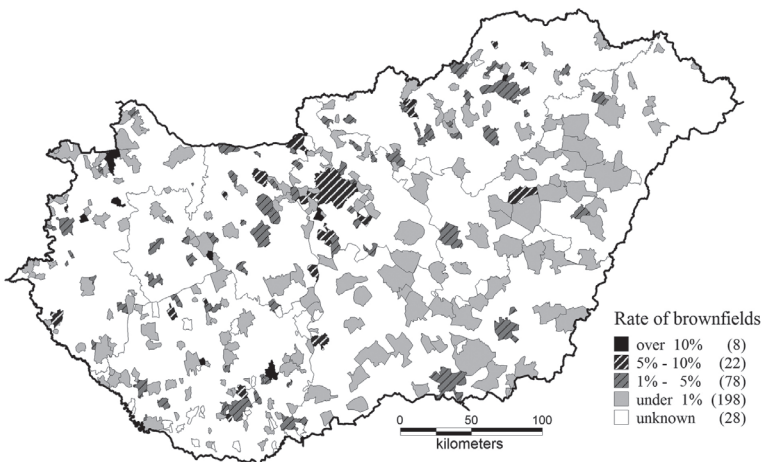


Fig. 1. The rate of brownfields in the administration area of settlements

Source: own elaboration

Among the most ‘rusty’ settlements emerge Taszár with a huge former military air base (it covers 29.4% of the administrative area of the municipality) and Sajóbáony (40.8%), a really small town with an extended industrial complex located in a hidden valley – actually a secured plant of military industry, including the production of explosives.

4. THE CHARACTERISTICS OF BROWNFIELD SITES IN HUNGARY BASED ON THE RESULTS OF MUNICIPALITY SURVEY

Based on the findings described above, it is not surprising that 79% of the municipalities that responded to the questionnaire have less than 20,000 inhabitants (Fig. 2). Overall, we had access to information about 91 brownfield sites with a total area of 2,963 hectares.

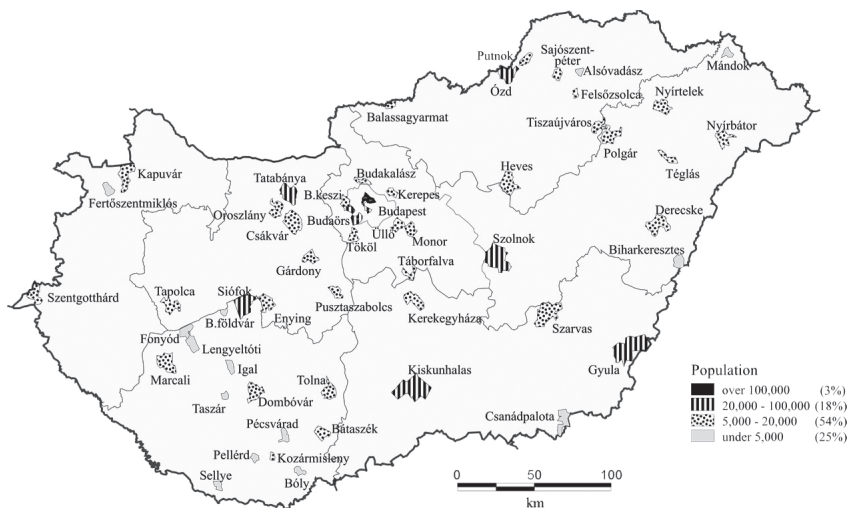


Fig. 2. The respondent municipalities according to population

Source: own elaboration

Of all surveyed brownfields 82.4% are located inside the built-up area of the settlements, 65.3% have a distance to the city centre of less than 2 kilometres. According to the answers, 46% of the objects are well connected to the cities' networks, and are not isolated. Concerning the former functions, traditional types of brownfields dominate (64.8%) with industrial (39.6%) and military (23.1%) origin. Monofunctionality predominates in the sample with 93.6% of all objects.

Every third brownfield is entirely abandoned, every fourth stayed without any functions for more than 10 years. 26.4% of these objects are categorised as underused, typically there are some smaller enterprises renting minor parts of the former site with diverse economic goals on services (logistics, retail – 38%) and industry (18.3%). Concerning the reasons why so many areas remain unused, those polled gave multiple markings indicating the complexity of the problem. Among the difficulties mentioned by them the lack of investors/capital ranks first (42.5%). Secondly, the considerable extra costs from the bad physical conditions

of buildings (22.8%), and thirdly, the regulations of heritage protection (9.4%) are important factors too. Besides the preformed answers of the questionnaire, some typical conflicts of the local stakeholders also occur, like the lack of cooperation between the parties involved and the constraints created by urban planning regulations.

70.4% of all the areas contain buildings, however, only 5.5% have higher built-up rates than 50%, and 26.4% of the territories are categorised as green areas. 23.1% of the buildings are in a highly desolate state and need to be demolished. The other 42.9% of the buildings need to be carefully renovated before being used for new functions.

Although according to references the mosaic-like pattern of ownership is one of the biggest typical obstructions for the regeneration of brownfields (see Barta, 2004), this problem hardly affects the studied settlements. In 67% of all cases, there is only one owner for the whole property. 62.3% of these single owners are private persons or privately owned enterprises. Local governments own 25.9% of all the areas while the state (or similar public bodies, for example the real estate agency of the Ministry of Defence) owns only 8.2%. Shared ownership is uncommon, only 5.5% of all recorded brownfields have more than five owners.

Of course, there are plans for development; for at least 60% of all territories the owners have more or less specific conceptions about the future of these sites. The main motive is the regeneration, the minority of the owners (23.6%) plan to sell the property. Planned developments are either public or private based (with a majority of local-government-led projects). The share of the PPP-projects is only 5.5%, which may be surprising for a Western European approach, but it reflects the Hungarian reality quite well.

The answers also indicate that these areas are ready for redevelopment: usually, they are provided with infrastructure and are accessible either by public roads only (26.4%), or by roads, railroads and public transport (27.4%). Only 1.1% have problems with accessibility. More than half of the brownfields have fully developed infrastructure (53.8%), but only 35.2% of the systems are in suitable condition and another third needs urgent renewal.

The question of environmental contaminations (Fig. 3) also occurs, but not in the scale that we expected before. More than half of all surveyed areas (52.7%) are not affected by any pollution at all – according to the municipal answers. On the other hand, the recultivation is slow, because 35.2% were contaminated and, so far, only 3.3% of these areas have been entirely cleared from pollution.

It is not easy to estimate how accurate these answers are, because an official environmental assessment has only been conducted on every fifth brownfield and there is no environmental data available in 42% of all cases. The most urgent remediation was finished in 27.6% of all cases, while in 17.2% of the areas the remediation was in progress at the time of the survey. Complex recultivation plans are created for seven areas, but funding is not secured.

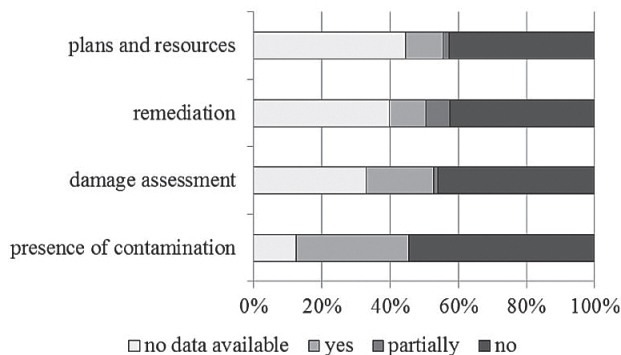


Fig. 3. Environmental contamination
Source: own elaboration

Brownfields likely possess elements of flora and fauna with significant ecological value or elements of architectural heritage. 52.7% of the areas in the sample are actually protected or worthy of protection; 16.5% of them even have multiple causes for protection. Especially important are areas with high sensitivity of water quality that were mentioned in 46% of all cases. Areas under the protection of the Natura 2000 Programme are also affected.

The last elements of the survey focused on the future plans for the areas. Results are more positive than expected, because only 23.1% of cases are without any specified concept and have a completely uncertain future. For the majority (62.6%), there are specific ideas which, in almost every case, mean the creation of a new function. These new functions are predominantly industrial-economical (in the form of industrial estates) or a composite of more purposes (see Fig. 4).

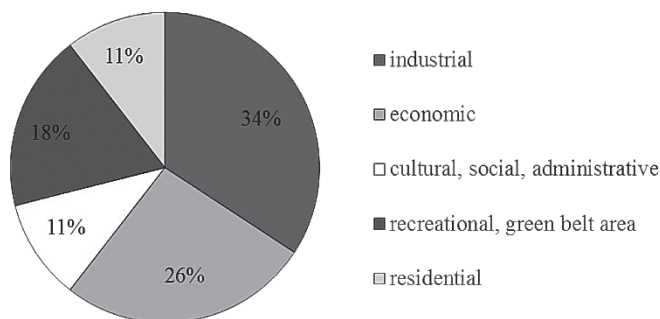


Fig. 4. The distribution of new functions planned for brownfield sites according to the local governments
Source: own elaboration

The survey – even though it only gives an overview about a fragment of brownfields – helps to highlight some important factors and correlations. The results emphasise that the failed regeneration is caused by the lack of financial resources and, in a wider context, the lack of economic power. Positive impacts on local economic prosperity and increasing demand for labour force: these are the effects mostly anticipated by the local governments from future development while environmental aspects are marginal. However, in the present conditions they could have a greater importance. Learning from the lesson of the monofunctional past, diversification becomes an important goal.

5. THE REGENERATION OF BROWNFIELDS BASED ON THE RESULTS OF OUR MILITARY BROWNFIELDS DATABASE

Just before the political transformation, military land use reached more than 49,000 hectares in Hungary (Table 3). Only 14.8% of the identified objects still have an active status today which is only 33.5% of the former territory. Another 35% of all territory (10% of the objects), are used extensively as pasture or farmland, or simple areas of nature conservation (former shooting ranges and training fields). The extensively used wide open spaces theoretically gained a new function, but it can hardly be considered as active rehabilitation, despite some of its elements (for example demining and clearing from ammunitions, in some cases environmental remediation). So we decided to separate these cases from the real revitalising process, because the extensively used, large areas would highly distort the overall picture. After the political transformation in Hungary, an intensive demilitarisation process started. During this process, almost 33,000 hectares of military area, including 18,130 hectares of training fields, lost their former functions.

Regeneration of military brownfields has nowhere and never been an easy task, especially in the East-Central Europe (see Myrntinen, 2003) – this reflects on the Hungarian conditions as well. Generally, the objects with residential, social and administrative functions have the biggest chance for being reused. Smaller barracks also have advantages compared to bigger ones, and of course, location is a very significant factor: many of the military sites were planned with the goal of hiding from everyday life.

Table 3. Number and size of identified objects by present functions

Present function	Identified objects			
	number	proportion (%)	size (ha)	proportion (%)
Agricultural use or part of a nature reserve	50	10.0	17,380	34.9
Completely abandoned	130	26.1	4,890	9.8
Abandoned, secured	73	14.6	4,960	10.0
Underused (functional change <50%)	65	13.0	2,780	5.6
Complete or high degree of functional change	107	21.5	3,070	6.2
Presently active military function	74	14.8	16,690	33.5
Total	499	100.0	49,770	100.0

Source: Orosz and Pirisi, 2014.

New civilian functions can be divided into three major groups:

1. Economic functions (44%): as it was indicated in the questionnaire responses, economic functions are in the focus when it comes to regeneration. The most popular form is to establish new industrial estates. For that purpose, a former military base is an almost ideal location (wide, spacious objects with various sizes and forms of buildings, located at the edge of cities provided with traffic access and infrastructure). Although there are several industrial estates established on former military grounds, the ‘success rate’ of these initiations seems to be quite low, according to our observations; typically, 60–80% of the area is vacant in these estates. Maybe the air bases are better examples of successful economic-based regeneration: in Debrecen and in Sármellék (near Lake Balaton) two international airports have been opened on the site of former Soviet military bases. Both running as regional airports, with relatively low, continuous traffic. These two projects use only the runways and some of the terminal buildings, maybe a couple of hangars and other supplementary buildings, while large areas of former bases (typically with aircraft shelters) remain untouched. The international airport of Győr-Pér is an example for another development path: the site was a military airfield, but only with an unpaved runway and classified as a reserve for wartime operations. The project conducted here was started from a lower level and did not have too many problems with former infrastructural elements. There are also some other good examples of new business functions, such as new malls and hypermarkets (like Park Centre in Esztergom and in Pécs) or exclusive offices (Leier Centre, Győr).

2. Communal functions (27%): inside this group, some university campuses need to be highlighted (Debrecen Kassa Street Campus, Kecskemét, Budapest-Óbuda).

Unlike industry, higher education had an extensive growth period in the 1990s, parallel to the demilitarisation, with a massive demand for new buildings. There are several other functions as well: police stations (Kiskunhalas, Pécs) and prisons (Szombathely) are easy to create from barracks, and retirement homes (Tolna) are a fast growing market in an ageing society like Hungary.

3. Residential functions (18%): the elements of this third group are mainly connected to locations in and around Budapest, as there was a huge demand in the property market in the last 25 years. Although there were other attempts to create residential zones in abandoned barracks besides the limits of the large urban agglomerations, experiences were mainly disappointing. Especially the social-led efforts of the local governments for creating cheap accommodation often failed. In these cases (like in Kaposzsekcső, Nagyatád, Lenti, Dunaföldvár) efforts led to the formation of ‘second generation brownfields’, the reproduction of wastelands within some years.

Although the functional range is really wide, generally the regeneration of military brownfield was a failure rather than a success (Fig. 5). If we just focus on the objects which were given to the local governments by the state free of charge, we find that the original goals of regeneration⁹ have been fulfilled in only 30% of all cases. Moreover, some of the sites have meanwhile been privatised. It is highly probable that the goals were not realistic and were not based on correct feasibility studies. The decision-making focused more on short-term (political) goals and interests rather than long-term sustainability of the projects.

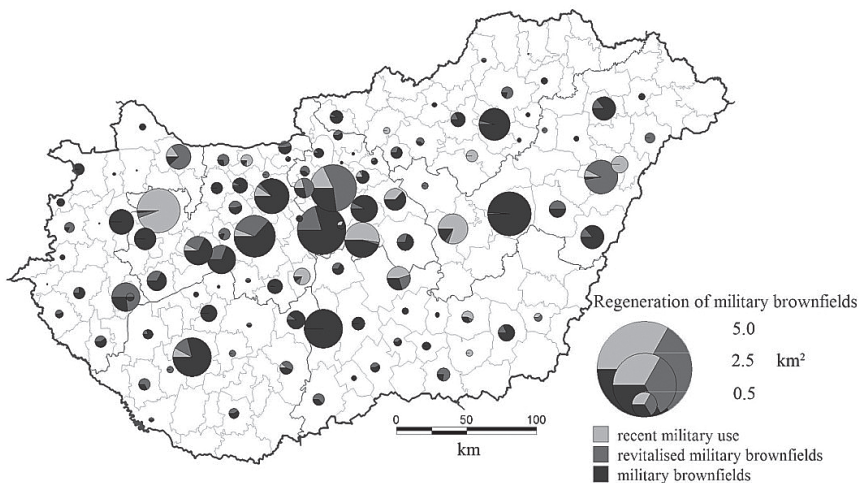


Fig. 5. Regeneration of military brownfields on microregional (LAU 2) level
Source: Orosz and Pirisi, 2014

⁹ The criterion for the handover of property to the local government was a goal of public interest, which could be achieved through the use of the new site.

Ideas and concepts of military brownfields regeneration have changed during the last 25 years, but – due to lack of financial resources in the defence sector – selling the properties to private enterprises was and remained the most desired goal. Four stages can be identified: disinterest and purposelessness (1), income-oriented area sale (2), development policy subordinated to party politics (3) and, nowadays, the efforts of sustainable spatial planning (4). This last approach is still in its infancy. The frequent changes in the legal framework regulating property handling by the Ministry of Defence and its handovers to the local governments have also influenced the process.

The functional transformation in the case of Budapest and some successful airport-developments have been completed. Beyond these, only a few real success stories among the military brownfields can be cited. Conversion was effective where the density and individual size of elements were relatively low. The large concentration of sites, even if they cover relatively dynamic spatial structures, is rather a barrier than an advantage.

Demographic change and its effect on the housing market also heavily influence the possibilities of regeneration projects. Former barracks in central locations have good chances, because the costs of architectural renewal are so high in a lot of the cases that there is no other real possibility but demolishing the buildings and reusing the area only. Even in this case, greenfield investments have advantages in costs.

PPP-projects are much less frequent than in Western European countries. Maybe, the fundamentals are missing: supporting initiatives and – despite some EU-financed objectives – financial incentives are missing. The connection between legal and financial instruments is entirely missing.

A consequence of the unsuccessful regeneration is the recreation of brownfields, the emerging of the second generation brownfields. Sustainability factors are often neglected in the initial phase of the projects. The ‘area as a valuable resource’ concept hardly takes root in Hungary. In an economy characterised by the overall shortage of capital, community goals and public interest-led projects seem to have a higher rate of success.

Demilitarisation is theoretically finished in Hungary¹⁰ but the selling of military objects by the agency of Ministry of Defence still continues. The majority of the former sites did not find a new owner and/or function – and many of them will never do.

6. CONCLUSIONS

Without a national cadastre, the number of brownfields in Hungary can only be estimated. Based on the data of the presented surveys we can assume that

¹⁰ Moreover, in the last two years, parallel to the growing geopolitical tensions, there is more and more talk of a partial remilitarisation of the country.

brownfields in the country reach a total of at least 20,000 hectares and a maximum of 40,000 hectares. This is two to four times more than expected before.

It can be determined that more than 300 settlements are affected and about half of these are municipalities with fewer than 5,000 residents. This contradicts the hitherto generally accepted fact that brownfields in Hungary are predominantly an urban phenomenon.

Due to the historical and economic development, the country is characterised by an oversupply of brownfields that came on the market at the same time. For a long time, no thoughts were spared about maintenance, let alone effective reuse. A significant proportion of the properties are long-term brownfields, so the existing building stock is now mostly dilapidated. The proportion of (especially ecologically) protected areas or areas worthy of protection is relatively high. However, these surface properties are difficult to reconcile with the development plans, since in these mostly industrial or commercial reuse of the surface is planned. The regeneration projects implemented so far cannot generally be considered a success either. Until recent years, sustainability was not the main focus, the future of the areas was dominated by short-term interests. The result of the failed conversion can be observed in the reproduction and the emergence of second generation brownfields. Funding is mainly through EU-funded projects, PPP-constellations are rarely observed.

Although Hungary may not be the country with the most serious brownfield-problems, we still believe that it is a very paradigmatic example for the countries in Central Europe concerning this topic. The challenges of regeneration begin with surveying and measuring and the willingness of decision makers to tackle these challenges. In a relatively sparsely populated country with shrinking demographics and strongly depopulating former industrial regions, the lack of demand for space will continuously slow down the efforts of brownfield regeneration.

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