

SPATIAL RELATIONS AND PERCEPTION OF BROWNFIELDS IN OLD INDUSTRIAL REGION: CASE STUDY OF SVINOV (OSTRAVA, CZECH REPUBLIC)

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ABSTRACT:

Regeneration of brownfields gradually becomes an important challenge for regional and local development across the East-Central European countries. Due to the recent huge economic transition and global societal changes thousands of abandoned sites (brownfields) sprang up across the landscape after various economic activities, the Czech Republic included. This paper evaluates the perception of brownfields along with their individual re-use options by local population in one of the city districts of Ostrava which was heavily influenced by industrialisation during the last 150 years (Svinov city district, city of Ostrava, eastern part of the Czech Republic). The first part of the paper is devoted to brief theoretical aspects of brownfields regeneration and its perception. The second part of the paper presents us with the results of the questionnaire survey which was carried out among local population of Svinov (n=163) focusing on the perception of five selected local brownfield sites. It was found out that the issue of brownfields rouses huge discussions among public of the model area of Svinov. Among the most supported re-use options of local brownfields greenery and cultural facilities were identified. Brownfield sites located outside the settled area of the city quarter are almost disregarded while the re-use of centrally located sites for greenery is strongly supported. In the final part of the paper, the findings are synthesized and recommendations for public administration and potential investors are formulated.

Keywords: *Brownfields Regeneration, Spatial Relations, Perception, Urban Renewal.*

1. INTRODUCTION

The perception of brownfield sites by its local population might be indicated as one of the most interesting parts of human-geographic researches focused on the issue of brownfields. It is indisputable that it is the population of the given area whose perspective and opinions should be primarily taken into account when planning the regeneration of particular brownfields. This approach represents the central idea of the following text and it runs through the following lines as a red thread. Thus, the aim of this paper is to evaluate the perception of brownfields at the local level and to indicate the most suitable re-use possibilities of the given sites from the point of view of local population of the area typical of its frequent occurrence of these sites due to more than one and a half century long industrialisation process. As a model area for the research Svinov has been selected, which

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is one of the city parts of Ostrava (third largest city in the Czech Republic with population of 300 000) and is located in the eastern part of the country near the Polish borders.

The regeneration of brownfields represents an important challenge of the contemporary regional development research, which is strongly manifested in post-communist countries of the East-Central Europe due to a transition of their economies over the last two decades. Besides that when we consider post-industrial trends in the society of the developed countries (Keller, 2011), which are manifested in a reduction of industrial activities with its relocation towards the less developed countries, and with growing in importance of the tertiary (Tvrdoň, Tuleja & Verner, 2012; Slach & Ježek, 2015) and quaternary sector (Turečková, 2014), it can be found out that the mentioned development causes an enormous occurrence of brownfield sites as the remainder of former industrial, agricultural, residential, military or other activities. These sites are used insufficiently (or are fully abandoned), neglected and might be contaminated (NBRIS, 2008). No matter how these sites are called or perceived in different national contexts (with the emphasis on their contamination or as a part of urban landscape – see Oliver et al., 2005), there is an overall agreement within the European Union over the urgency of their regeneration.

Nevertheless, in conditions of the East-Central European countries it is apparent that the occurrence of such massive numbers of brownfields sites does not allow their quick regeneration due to their frequent soil contamination, size, ownership structure etc. Thus it is necessary to focus on sequential steps when dealing with brownfields issue, such as public education focused on environmental and social benefits connected to brownfields, promotion of examples of best practices, public funding (or co-funding) of flagships of brownfield regeneration projects or even a development of databases of brownfields. It is also essential to perceive the issue of brownfields in a wider context of not so positive tendencies of the recent urban development (urban sprawl), global environmental problems (land take), but also in the context of the development of local population identity that is connected to historical heritage of industrial brownfields in many cases (Rumpel, Slach & Koutský, 2013).

Researches focused on the perception of brownfields by its local population and on their influence (or their regeneration) on the local development gradually begin to occupy an important part of not only human geography, but also of other researches focused on urban issues (such as sociology, urban planning, urbanistic economy etc.). It is indisputable that the occurrence of brownfields as potentially contaminated sites generates interests among health disciplines as well, concentrating on the impacts of contaminants on the health of population which lives in the proximity of brownfields (Greenberg, 2002; Litt, Tran & Burke, 2002). Brownfields located in the central part of big cities form a specific group of sites (Temelová, 2007; Kunc et al., 2014b), whose attractive location provides them with better chances to be regenerated in near future. On the other hand, the regeneration of brownfields located in peripheral areas is usually more problematic regarding their new use, some of them being successfully utilized for location of renewable energies production systems (Klusáček et al., 2014).

The issue of brownfields has been also frequently studied from various points of view of different groups of stakeholders (local population, investors, public administration, tourists etc.) and on various regional hierarchical levels (local, regional, national etc.). As it has already been proved by a set of studies (e.g. Alker & Stone, 2005; Hercik et al., 2014; Frantál et al., 2015a), interests of various groups of population towards a given brownfield regeneration project (and contextually its perception) might be contradictory oftentimes. Hence local public administration should focus on coordination activities to avoid potential

conflict and to ensure that potential edges will be smoothed (Howland, 2003). This targeting of public administration activities was emphasized in studies focusing on categorization of brownfields (Vojvodíková, Potužník & Buergermeisterová, 2011) or their prioritization (Thomas, 2002; Chrysochoou et al., 2012; Frantál et al., 2013; Doležalová et al., 2014; Frantál et al., 2015b).

2. METHODOLOGY AND DATA

The selection of research design of the presented study has been inspired by a set of already published studies that focus on the perception of urban spaces and urban brownfields in the western part of Europe, USA, Canada (e.g. Coffin & Shepherd, 1998; De Sousa, 2000; Eiser et al., 2007) and in the post-communist countries of the East-Central Europe (e.g. Cobârzan, 2007; Krzysztofik, Kantor-Pietraga & Spórna 2012; Filip and Cocean, 2012; Duží and Jakubínský, 2013; Kunc et al., 2014a, 2014b;). The area of Svinov (one of the city parts of Ostrava – see **Fig. 1** for geographical context) has been selected for the research due to its frequent occurrence of brownfields owing to its rich industrial history (see below). In the initial phases of the research a thematic retrieval of literature, strategies and concepts of brownfields regeneration and its perception was carried out. A database of existing brownfields in Svinov has been developed on the basis of a wider brownfields database of the entire city of Ostrava in 2010 (<https://dycham.ostrava.cz/brownfields/brownfields.html>), which was supplemented by a detailed field research to make the existing database as recent as possible (early months of 2014).



Fig. 1: Location of Ostrava in the Central Europe

Source: authors own processing

In the next step five brownfield sites in Svinov were selected meeting the requirements of being located at attractive geographical locations within Svinov and thus having a higher probability that they will be regenerated in near future. Basic descriptions of individual brownfields (an empty mall/plato, a shopping mall, a former mine, a distillery and crews) are part of **Table 1**. The location of the selected sites within urban space of Ostrava and Svinov city part shows **Fig.2**.

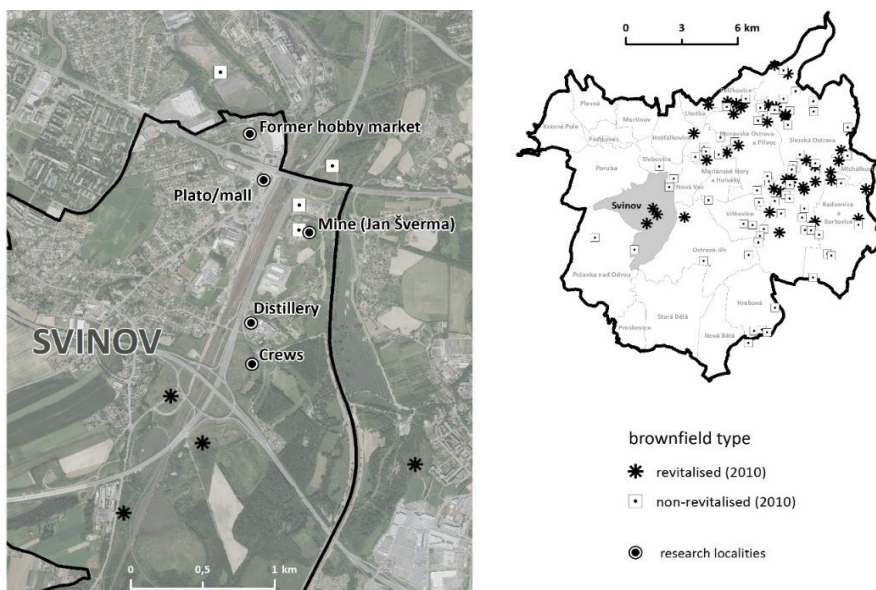


Fig. 2: The location of the selected brownfield sites within Ostrava (and Svinov city part)

Source: authors own processing

Table 1: Basic characteristics of selected case studies in Svinov

name of site (area)	location	original use	contemporary use
mall with small shops (an area of 3 hectares)	between Svinov bridges and a railway station	originally a part of never finished Svinov bridges transport node from 1970s, used for small shops, due to the reconstruction of bridges and nearby railway demolished in 2010	empty space between Svinov bridges and a railway station
hobby market (area of 2 hectares)	Bílavecká 93/2A Street	originally an electronics store and a hobby market built in early 2000s, unused since 2011 due to slag of bad quality under the building	abandoned, unused
distillery (area of 3,5 hectares)	Luční Street 573	originally a distillery founded in 1899 in a classical industrial architectonic style with a housing colony located nearby, after WWII nationalized, since 1997 closed, damaged by huge floods in 1997	partly used, several small companies located in the area (truck company offices)
crews (area of 8,5 hectares)	Luční Street	originally large fish crews, then a multipurpose area, part of the area covered by water reservoir, now partly abandoned, in flooding area	only a third of the area is used as stocks
mine (area of 8,3 hectares)	Františka a Anny Ryšových Street	originally Jan Šverma Mine II, founded in 1964, ended operation in 1991, 1994 – demolition of the mine tower, next demolitions due to nearby highway construction	administration building of mine, used as a dormitory for poor people

Source: authors own processing

As a research method semi-structured interviews among local population of Svinov were selected. A questionnaire (or better a guide for individual interviews) has been

developed as a set of twelve closed questions with a possibility of further explanations of individual issues and communication of reflections and comments of respondents. A research was carried out during March and April 2014 in the proximity of five selected brownfields sites with local population (older than 18) of Svinov. In total, 163 questionnaires were gathered. A preliminary research for testing the validity and accuracy of the questionnaire (the guide for interviews) was performed during February 2014 on a sample of ten respondents.

To ensure the validity of gathered data a balance between individual groups of population (age, gender, education) according to the last population census (2011) was kept (see **Table 2** for details). More than a half of respondents fall under the age category of 26-40 with secondary education as the highest level of education achieved, which corresponds with the population structure of the surveyed city part. Once the questionnaires had been gathered, the data was digitalised and evaluated.

Table 2: Basic categories of survey respondents

gender	male (42,9 %) female (57,1)
age categories	18-25 years (25,8 %) 26-40 years (53,4 %) 41-50 years (10,4 %) 51-65 years (8,6 %) 66 years and more (1,6 %)
educational structure	primary (15,1 %) secondary (58,9 %) tertiary (26,0 %)

Source: authors own processing

The data related to socio-demographic structure of population of Svinov come from the Czech Statistical Office and censuses (www.czso.cz), the data related to land use changes were taken from the databases of the State Administration of Land Surveying and Cadastre (www.cuzk.cz) (for period 1999-2015). Historical lexicon of municipalities of the Czech Republic (1869-2001) was needed for the long-term population and houses development data. The gathered data was analysed using standard human geographical methods and cartographical analyses were performed using Arc GIS 10 software.

3. DRIVING FORCES OF THE OCCURRENCE OF BROWNFIELDS IN SVINOV

As has been already stated above, the Svinov city part (on the area of 1 162 hectares) was selected for the research focusing on the perception of urban brownfields due an abundance of such sites in this area. This fact mirrors the rich industrial history of Svinov whose origins can be tracked back to the middle of the 19th century, when a railway station was founded in Svinov on the railway track connecting Vienna as the capital of Austrian monarchy with areas of booming industries in the northern parts of the country. The fact of establishing the Svinov railway station on the Emperor Ferdinand Northern Railway became an impulse for the boom of local industries. An originally pure agricultural community gradually transformed into one whose population started to work in the dynamically developing local industries and mining.

An unprecedented development of coal mining and heavy industries in the area of Ostrava agglomeration (once formed by independent cities, towns and villages) mirrors the development of Svinov, where the attempts to extract coal during the second half of the 19th century also occurred. However due to unfavourable natural conditions for coal mining caused by the location of Svinov in floodplain these attempts were not successful. Thus, coal started to be extracted here as late as in the 1950s pursuing the intensive communist natural resources policy as well as the technological development, which made it possible

to extract coal in less suitable areas. The mine named Jan Šverma II was dredged here (1951-1964) and stayed in operation until 1992 with an average annual amount of coal extracted being 300 thousand tons. After the fall of the Iron Curtain in 1989 and its subsequent societal and economic changes the mines in the whole of Ostrava area were closed down.

The origins of engineering industries in Svinov might be tracked back to the last decade of the 19th century, when a plant for pipes production owned by Oscar Hutschinsky (since 1908 part of the Mannesmann company and since 1947 part of the nationalized Vítkovice ironworks) was built in the immediate proximity of the railway station. Industrialisation and growth of economic importance of Svinov brought about the development of housing for the local factory employees in the late 19th century (built of fair-faced bricks). The development of industries in Svinov proceeded with the industrialisation of a local steam mill and a large bakery plant (1891-1893), foundation of a steam brickyard (1897) and a distillery (1899). Two decades later the local industry was enriched by a new plant for the production of copper wires (1922), which was closed down after its nationalisation under the political decision from 1951. In the same period a plant for production of wire and iron goods was opened in Svinov (as a part of the nationalized Vítkovice ironworks). The boom of industries in Svinov led to an enormous increase of commuting to work as well as a population growth (between 1890 and 1930 the population number grew to circa 5 400), which was accompanied by huge housing development (the number of houses increased fivefold during the same period).

After the end of WWII larger companies in Czechoslovakia were nationalized due to a political decision. This tendency to reduce entrepreneurship was strengthened after communists' putsch in 1948, when the rest of the companies were quickly nationalised (without any compensation to their private owners). After 1948 a regulated reduction of housing function in Svinov in favour of industrial function could be noticed very clearly. In the neighbourhoods of Svinov large housing estate (Poruba) was built in short time to accommodate migration flows of workers to Ostrava industries and mines. At the beginning of 1960s Svinov administratively became one part of Poruba city (part of Ostrava). The reduction of housing function in Svinov did not stop until the end of the communist era in the late 1980s. As a result of such policy only 3 400 inhabitants were living in Svinov during that time. After 1990 when Svinov became an independent city part of Ostrava once again and its rather rural built-up areas became attractive for new suburban incomers, the population of Svinov has increased since then reaching almost 4 500 people at present and thus increasing by one third. This tendency is in contrast to the population development of Ostrava city as a whole which has experienced a systematic decrease in the last two decades (by circa 7 %).

As a consequence of the outlined long-term economic development of Svinov plenty of brownfields sites can be found here (87 hectares in total, which makes 7,5 % of total area). It can be also stated that as a result of such intense residential houses developments and transport infrastructure construction (railway, highway) more than 32 hectares of agricultural land disappeared in the last fifteen years. When quoting official statistics, the share of built-up areas in Svinov slightly decreased (by circa 10 hectares since 1999 in absolute numbers), however a strong increase in the so called „other areas“ category can be noticed (this land-use category covers transport infrastructure constructions and areas after demolition of brownfields - 43 hectares in total). From the perspective of brownfields regeneration in Svinov it is necessary to bear in mind that an important regeneration project

of the reconstruction of the railway station and connected pre-station areas was realized between 2003-2005 and 2011-2013.

4. RESULTS AND DISCUSSION

The results achieved by the presented research might be divided into two parts. The first part was focused on brownfields regeneration from the general perspective, while the second part was devoted to an evaluation of particular brownfields sites in Svinov (5 model sites mentioned and described above – see **Fig. 3-5** for more specific relations in their neighbourhoods).



Fig. 3: Location and basic relations in neighbourhoods of a former mine (Jan Šverma II - left) and former hobby market (right) in Svinov.

Source: authors own processing, www.maps.google.com



Fig. 4: Location and basic relations in neighbourhoods of former crews (left) and empty mall (plato - right) in Svinov.

Source: authors own processing, www.maps.google.com

As it has been shown in the results of the questionnaire survey in Svinov, the majority of local population (almost three quarters) is aware of the fact that the occurrence of brownfields (usually former areas strongly influenced by long term industrialisation) is closely related to the occurrence of social, economic and environmental problems. The most frequent worries are those of potential contamination of soils and water in the

proximity of brownfields sites, followed by concerns about the concentration of socially-pathological phenomena within or in the proximity of brownfields such as increased criminality, homelessness, in-migration of poor population to areas with a very cheap housing (dormitories for poor people). Economic consequences are perceived less controversially, however people expressed their concern about the decrease in the price of their real estates in the proximity of brownfields.

As has been already mentioned, officially recognized brownfields in Svinov cover an important part of this city part (87 hectares), which means that local population is confronted with their impacts on a regular basis. Thus, it is understandable that the support for re-use of these sites is very strong in Svinov (76 % of respondents). Especially strong support for the re-use can be seen among older population and retired people, who both used to work in the areas of contemporary brownfields. On the contrary, the younger generation of respondents does not perceive brownfields in Svinov as a strong problem. This fact is not very surprising, yet due to campaigns focused on the promotion of the brownfields re-use and thus trying to increase awareness of this issue among public, such attitude isn't what should be expected.

As it has been shown in the results of our research, the respondents strongly supported the coordination role of public administration during the brownfields regeneration process, nevertheless more than 90 % of the respondents consider nowadays activities of public administration in Svinov as insufficient. The respondents pointed out new constructions on greenfields in Svinov, which usually obtain (in case of family houses) construction permission from local public administration without any major difficulties.

The local population would welcome a stronger pressure of public administration on owners of brownfields and prioritization of brownfields during the permission process. Plenty of comments arose stating that brownfields regeneration costs are definitely higher than greenfields construction costs, so these extra costs (e.g. for de-contamination) should be at least partially covered by public money to levelise the costs of both investments.

An analysis of replies to questions connected to the familiarity with the term brownfield revealed some interesting results. An indisputable fact is that many respondents came across this phenomenon at some point, yet the terminology was different (e.g. they referred to it as "areas after industry" since 1980s), however more than a half of the respondents was not familiar with the term brownfield.

It is obvious that inhabitants of Svinov do not address brownfields by this term, yet they prefer to call them by their local names in combination with the names of the companies which operated there for decades. Another explanation for this might be in the non-existence of any equivalent of the term brownfield in the Czech language. In some cases the idea that brownfields are solely linked to contaminated sites occurred (which is actually the case in several countries such as Romania or Italy).

In the next part of the survey the respondents were questioned on five particular brownfield sites in Svinov (see the methodology part for the explanation of the selection process). Since the respondents of this survey are solely inhabitants of Svinov, it can be assumed that they are able to assign the local names of sites to the matching brownfields. In case it was a problem, the explanation of the exact location of (usually generally known) brownfields sites was necessary. After that the question was targeted at the identification of brownfields (mall/plato, former hobby market, distillery, crews and mine), which are the most known and the most discussed among public in Svinov, and thus they seem to have a higher chance to be regenerated in near future. Among the most frequent sites mentioned by the respondents belonged plato/mall (33 % of respondents) and a former hobby market

building (29 %), which are both located in the most attractive part of Svinov easily accessible by both public and individual transport (see **Fig. 6** with pictures of these sites).

On the other hand, sites located in peripheral parts of Svinov and thus less easily accessible were not mentioned very often (a mine was mentioned by just 7 % of respondents). This result leads us to the statement that the promotion of less easily accessible brownfields should not be underestimated among Svinov population who generally supports re-use of brownfields against greenfields constructions, and at the same time doesn't know much about sites availability. In this context it can be stressed that the limited awareness of a former mining area might be also caused by the demolition of its dominant (the mining tower) in the mid-1990s. It seems that the identity of this site with its symbolic expression in the minds of population disappeared alongside with the tower removal.

In the next part of the survey respondents were asked to evaluate the individual re-use options of the above mentioned five brownfields. The best-known brownfield in Svinov (mall/plato) is an empty area located between the so called Svinov bridges and a railway station (see **Fig. 4 right** for the location of the site and **Fig. 6 left** for the picture), where a new shopping mall is supposed to be built as an investors plan. However, as we learned from our survey the local population prefers its re-use for greenery/park (38 %), followed by sport facilities (24 %) or cultural use (21 %). Only a minority of respondents support the idea of a shopping mall re-use option (11 respondents in absolute numbers). The second most popular brownfield in Svinov (a former hobby market – see **Fig. 3 right** for its location and **Fig.6 left** for the picture) was defined as a suitable place for sport facility by the majority of respondents, which was by far the strongest opinion detected in this survey – see **Fig. 7**).

Approximately one seventh of the respondents accept the original use of the site (a hobby market). A re-use option of housing was detected to a larger degree just in cases of a former distillery and crews (20 % support). Since both mentioned sites are located in rather peripheral locations within Svinov, it tells us a lot about contemporary preferences of population who prefer housing on the margins of settled areas. It is also a very remarkable fact that two fifth of population support the re-use of crews (**Fig. 4 left**) for cultural facilities. It is quite surprising how frequently the re-use option for culture was mentioned. This might indicate a lack of facilities of cultural use in Svinov, whose local population is forced to travel to other parts of Ostrava to enjoy cultural events (theatres, cinemas, concerts etc.).

At the same time it is worth stressing that the re-use option for a shopping mall construction never exceeded support of 7 % but in one case (with the already mentioned former hobby market). It can be assumed that the current amount of shopping malls in Svinov and its neighbourhood is perceived as sufficient by the respondents, and there is no need for its further increase in future.



Fig. 5: Location and basic relations in neighbourhoods of a former distillery in Svinov
 Source: authors own processing, www.maps.google.com



Fig. 6: Examples of brownfields sites in Svinov – an abandoned shopping hobby market (left) and empty site after the demolition of a mall (plato - right). Source: Stanislav Martinát (May, 2015)

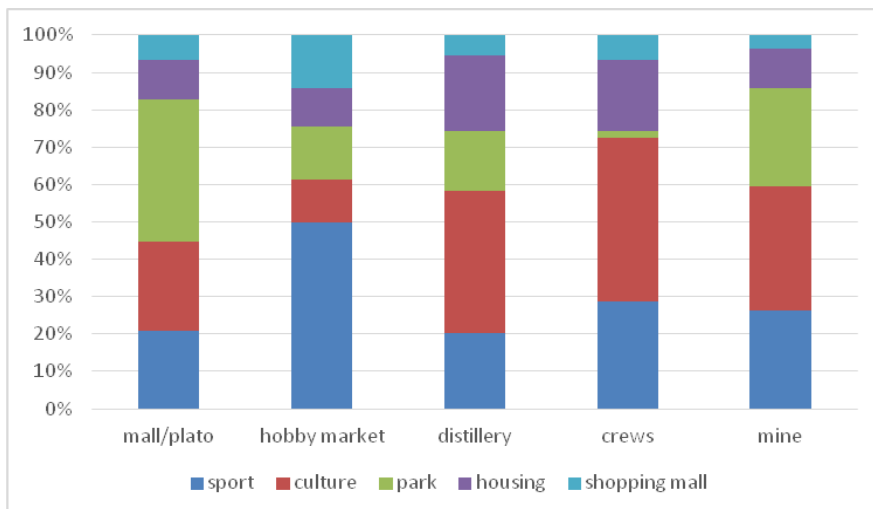


Fig. 7: Perception of individual re-use options of selected brownfields in Svinov
 Source: authors own processing

6. CONCLUSION

On the basis of the conducted survey several conclusions, all of which might be generalized for the contexts of the East-Central European countries with similar structural transition problems, might be defined:

- i) the issue of brownfields regeneration strongly resonates among population of areas with a higher level of occurrence of this phenomena;
- ii) parks appear to be a heavily supported re-use option for brownfields in urban areas, on the other hand housing as another re-use option is relatively strongly supported in more peripheral locations (out of the settled area or on the margins);
- iii) a strong support for cultural and sport facilities has been detected;
- iv) the term of brownfields is not used so frequently, population prefers local names;
- v) stronger attention is paid to brownfields located in central parts, brownfields in peripheral parts of cities tend to be disregarded more due to their smaller attractiveness;
- vi) it seems that the opinion of public about future of the most popular brownfield (mall/plato) in Svinov strongly differs from the plans of investors; regeneration plans which rise contradictions should be adapted and opinions of other groups of stakeholders should be taken into account.

Regarding the conclusion mentioned above the cooperation of various groups of stakeholders (and their active participation) concerned in the given brownfields regeneration projects can be indicated as a key recommendation (cooperation of representatives of public administration, local population, investor, local entrepreneurs etc.). Respecting opinions of future users of the sites will help us to accept the new re-use of the brownfields sites and thus contribute to effective investments of not only money, but also time and energy spent on the renewal of brownfields.

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