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POSSIBILITIES OF MITIGATION MEASURES UTILIZATION AT BROWNFIELD REGENERATION



1. Introduction

Brownfields problem plagues more and more cities. Built-up areas of cities constantly expand, while in urban areas there are huge idle areas. Especially in the cities, which grew thanks to monofunctional industrial production in the past, brownfields are one of the most pressure problems (Pačlová, 2011).

Also public administration sees brownfields as problem. Identification of brownfield land is currently included in the surveys and analysis of spatial plans of the municipalities. These areas are designated primarily as territories for reconstruction or transformation (Ruproch, 2011).

The re-use of brownfields land runs counter property relations uncertainties, geological environment contamination, poor social status of location and, of course, the lack of funds for complete regeneration this sites (Kuda, Smolová, 2007). One of the important barriers is evidently lack of information and knowledge which are needed by professionals working in decisive sphere and by investors and developers as well (Pletnická, Vojvodíková, 2006). There is also no complete inventory of brownfields in the Czech Republic, especially inventory of smaller areas in small villages, which is not so big problem, but it is important to solve it (Votoček, Vojvodíková, 2011).

We can divide brownfields into three categories, see Fig. 1. This distribution model is particularly suitable for institutions responsible for regional development and investment in it. This categorization can be a basis for decision about appropriate regeneration strategies for various types of brownfields. Identifying the type of object and consideration of factors that affect the categorization of objects is the basis for the determination of the intervention options and regeneration strategies. Use of this conceptual approach to explore the factors that affect the change of object categories (e.g., from B to A), may lead to the development of strategies specific to a particular object or location (Petříková, Finka, 2006).

However, it should be noted that the division into different categories is not scientifically substantiated. It depends on particular processor of brownfields inventory, he can choose different classification criteria for classify particular brownfield site.

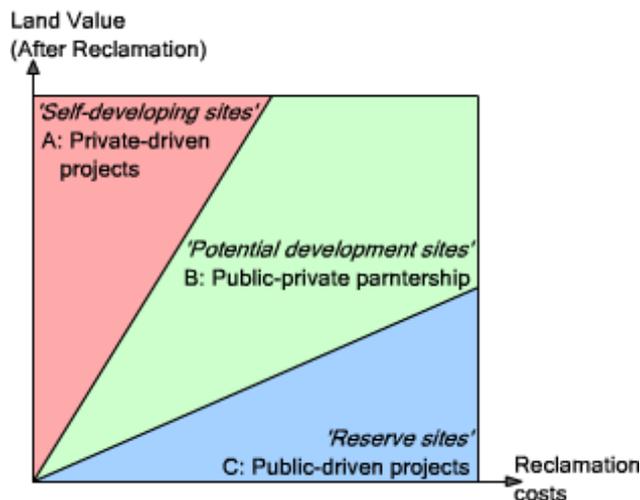


Fig. 1. Scheme of brownfields distribution (project CABERNET, 2005).

Each brownfields category can be characterized as follows:

Category A

- Projects implemented by the private sector, self-evolved projects,
- these sites and structures represent a highly economical and viable development projects

Category B

- Projects implemented primarily through PPP, potentially developing projects,
- these locations and objects are characterized by reaching the threshold gain.

Category C

- Projects funded from public sources, objects with certain restrictions,
- locations and objects in this category are not in a condition to profitable revitalization,
- revitalization of these objects depends on public sector or local government projects,
- public funding or specific legislative instruments (e.g. tax incentives) are needed for stimulating of the revitalization of these objects.

2. Characteristics of mitigation measures

Main aim of mitigation measures is to reduce the negative brownfields impacts on the environment as much as possible at the lowest possible price.

Negative perception of brownfield areas often causes a negative perception of the whole district, especially if the emergence of brownfields is associated with the growth of crime and unemployment rate in the area (Ferber, 2006). Then, urban areas can become ghettos with destroyed and half-empty housing stock (Hurníková, 2009). Correctly applied mitigation measures may result in particular improvement of overall area's image and may also help to increase the interest of new potential investors in brownfield improvement.

From the above it is clear that the application of mitigation measures relates primarily brownfields B and C.

Mitigation measures can be divided into so-called soft and hard ones (Votoček, 2009). Soft measures have no direct impact on the regeneration of brownfield, their aim is rather to raise awareness of particular area among the public, unify the vision and goals of various interest groups, etc. In particular, they are e.g. the various discussions, lectures, articles in regional newspapers, newsletters, etc.

In contrast, hard measures have a direct impact on the appearance of brownfield and its impact on the environment. Their analysis is given in the following text.

3. Brownfields security

The basic measure that should be done is to ensure the security of the entire area of brownfield. The minimum standard should be a bricking the windows and doors in the first floor and repair and maintenance of the area's fence. The best addition would be the installation of the CCTV system, eventually a private security agency, which also represents increased financial costs.

Static ensure of object is necessary too, especially in cases when public space should be threatened e.g. by falling ledges.

Social control is also an important contributor to security of each area. It is always true, that places where are some people are not so destroyed as completely abandoned areas. Use of historical potential of brownfield is suitable tool for more effective social control.

Each brownfield was a lively place in the past and form a historical reference of previous years. This fact could be used in cases where we could lead, for example walking or cycling path trace through the brownfield (e.g. old factory area). If brownfields is secured and visitors could not be at risk by technical conditions of structure, it is an interesting alternative of brownfields use. This route would be also complemented by boards with historical photographs, eventually by visualizations of possible further development. These routes are still rather unusual so they could be quite popular and attract many visitors. Partly illustrative example of such route should be newly built bike path in Prague-Hloubetin, which is leaded through former industrial area (see Fig. 2). This path is also partly leaded on former railway place. It means that it has perfectly vertical alignment and does not need any new infrastructure e.g. new bridges (Filler, 2010).

4. Overview of some other mitigation measures

Other mitigation measures can be divided into short-terms and long term ones. The following list shows only the most important.

Long-term measures:

- demolition of old abandoned objects,
- greening of location,
- completion or modification of transport and technical infrastructure,
- design social programs that will support the process of regeneration.

Short-term measures:

- commercial use – billboard advertising,
- placing the banner with future use visualization,
- partial or temporary use.



Fig. 2. Bike path through former industrial area in Prague – Hloubetin (Filler, 2010).

A major problem that could cause actual impossibility of brownfield reuse is existence of old abandoned buildings and equipment, often in poor condition. For this reason, it is better to remove these objects and greening entire area by plants, which are not expensive and do not claim for regular maintenance. This measure can, of course, be very expen-

sive, but some of these actions can get financial support from the EU funds. If we decide to just greening sites (e.g. planting trees in front of unsightly facades), the cost will be much lower, of course, but do not improve the technical condition of brownfield. But the overall image of area will be sure much better.

Deficiencies in transport and technical infrastructure (poor technical condition, or complete absence of them) are common obstacles that hinder the development of many sites. Completing the construction or modification of them can increase the interest of potential investors the site.

Various social programs can also help the overall state of brownfield. These include programs that seek to preserve the history and memory of the city, or various retraining courses for local residents; in order to they become attractive employees for future investors.

Location of large-scale commercial across the facade of the building can be an interesting idea for brownfield revitalization. First, it hides the unsightly condition of the facade and second, further measures to improve the status of brownfield should be funded from advertising revenue.

Installation of a banner with visualization of possible further use in the future near area will help overall awareness of unused area too. Such visualization may be got virtually free from students of high schools and universities which deal building and architecture. The only cost is making of the banner and its security. This measure, however, can significantly increase the interest of potential investors in brownfield.

It is also clear that any use of the building, even partial, is better than none, which is again related with increased social control. Brownfield areas should be used e.g. for sports. We have many sports, which do not need quality surface (e.g. beach volleyball, petanque, paintball, airsoft) and should be operated in abandoned areas. The costs of such measures are relatively low, but again they will help attract people to the site and change the perception of the whole brownfield.

An interesting alternative is to hire brownfields to various interest, mostly artistic, groups. These people can find some sort of artistic potential in abandoned buildings and use it for their activities to attract visitors. We know some examples of these artistic activities significantly contributed to the final complete regeneration of brownfield areas (see Chap. 5).

Extensive areas with lots of hard surfaces can also be temporarily used, mainly for cultural events. Former airport in Hradec Králové in the Czech Republic is an example of this area. It has been used for holding grand concerts for tens of thousands of people. This fact has significantly contributed to enhance the image of the location. Residents do not perceive this location as a problem, but as a great cultural place.

5. Foreign experiences

Mitigation measures began to be much earlier in foreign countries than in the Czech Republic. Further, there are some illustrative examples.

5.1. Riverside mill (Reha, 1999; Deller, 2012)

It is a brownfield site in Providence on the east coast of the USA. Originally, the site was used as a textile factory, founded in 1863, over the years it was used by many owners for many purposes. A big fire in 1989 was virtual end of factory and buildings began to decay since this moment. In 1990's, however, it was decided to build a greenway along the river Woonasquatucket, which just run across the area of the former factory. For this reason, it was decided to apply some mitigation measures. All objects were strictly secured and many plants were landed. So the whole area better fits into the concept of greenways and old buildings al-

so complete the historical picture of the original use. Brownfield do not constitute an obstacle to the development of greenway, but it became a part of it (Fig. 3, 4).



Fig. 3. Riverside mill as a part of greenway (Deller, 2012).

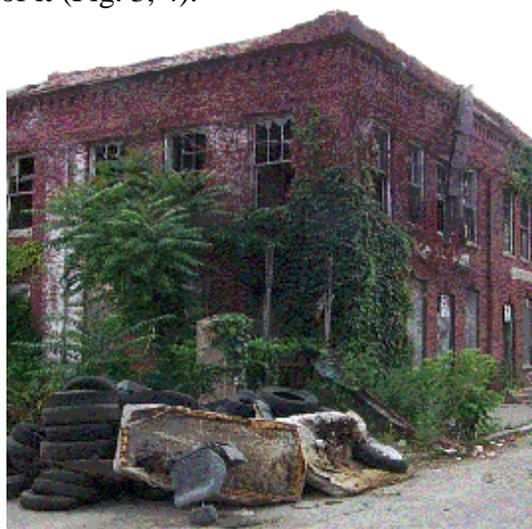


Fig. 4. Greening brownfield – Riverside mill (Deller, 2012).

5.2. Backfabrik, Berlin (Votoček, 2005)

Backfabrik is one of many old production facilities in the territory of Berlin. The whole building used to be a huge bakery which produced bread for the entire eastern Berlin. Production was halted and the whole area began to deteriorate in 1990's as a result of industrial restructuring. This situation did not improve until the arrival of a group of artists who had decided to use the building for their activities. They agreed with the owner of the short-term lease for a symbolic price. Artists started hold concerts, exhibitions, talks or discos in the factory. So public stopped perceive this area as a brownfields, but it started be a living entertainment centre for them. Then, this reputation was used by private developer who reconstructed the entire building into loft apartments and offices. So today, the whole area is again full part of the city (Fig. 5, 6).



Fig. 5. Cultural life in Backfabrik (Votoček, 2005).



Fig. 6. Today's Backfabrik (Votoček, 2005).

5.3. Žilina-Záriečie station, Slovakia (Dobiaš, 2012)

This train station was originally placed on Košice-Bohumín track in 1899, the today's main building was completed in 1945. This station was very popular among residents, because its operation also lived there, so the tickets was sold virtually "from bedroom" in a pleasant home atmosphere. In the 1980's, an elevated roundabout was built around the station, so surrounding buildings were demolished. Station stayed as an island among roads. Then the original operation had to move away due to austerity measures on the railway and object was abandoned since this moment. In 2002, a group of artists called Truc sphérique found this building as an ideal place for their activities. They were also able to convince Railway Company of Slovak Republic about their interests and obtain this structure into a long-term lease. Artists reconstructed the building and started to hold exhibitions, workshops, and even theatrical performances there. They maintain function of railway station as well. So it has many visitors and certainly it is one of the most important stations in Slovakia.

In 2009, the group also built the so-called S2 (station 2). They used straw bales, OSB boards, railway sleepers and even a 12-meter shipping container as an entrance for construction of it. The structure was built under the elevated roundabout, which forms its roof; the construction is not related with it. Station thus acquired a new capacity for cultural and social events and particularly for their independent art (Fig. 7, 8).



Fig. 7. Žilina-Záriečie station (Dobiaš, 2012).



Fig. 8. S2 construction under roundabout in Žilina (Dobiaš, 2012).

6. Conclusion

We can say that the main objective of mitigation measures is to reduce the negative impacts which all brownfields bring to its surroundings. An overview of these measures provided here is certainly not complete, only the most important and best known measures are listed here.

Mitigation is not too widespread in our conditions, although it is a relatively inexpensive tool to help our brownfields. The solution to this situation lies mainly in raising information giving to experts who deal with brownfields and to brownfields owners. This must be done long, because new brownfields sites rise every day and reconstruction or regeneration of them is always at least a matter of a few years (Bergatt, 2005). The foreign examples can serve us an inspiration, how it is also possible to proceed to the regeneration of abandoned sites.

Finally, it should be emphasized that even properly applied mitigation measures do not replace the complete reconstruction of brownfield land and any such land should be completely re-constructed.

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