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THE EFFECT OF BROWNFIELDS ON THE URBAN STRUCTURE OF CITIES

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ABSTRACT

A topical problem of the urban development - appearance of the abandoned (underused) sites after the suppression of the industrial activities (brownfields). The necessity of the redevelopment of those sites from the point of view of urban economy and general development of the city. The brownfields regeneration issue: the clean-up of the site, ownership, reusing of abandoned area, marketing strategy and sources of redevelopment financing. Step by step development, regeneration conditions and the process systematisation, the role of public administration and entrepreneurial sphere, the role of urban planning.

KEY WORDS

- Brownfields
- Non-utilitized industrial areas
- Projects of regeneration
- Urbanistic economy
- Environment

INTRODUCTION

A new problem in the site development of the cities - the occurrence of brownfields (abandoned areas) left after the former industrial activity. The occurrence of abandoned production areas is associated with the technical and economic development of industrial countries, when the centres of traditional industries cease to exist or are reduced. After an economical decline of industrial branches more or less extensive complexes of buildings, halls, production facilities and technical infrastructure not serving their original purpose remain abandoned. These complexes are devastated, and in addition, the areas and buildings are often contaminated with substances hazardous to the environment. At the same time, such areas are attractive from the aspects of site planning (they are often situated near the centres of cities or in areas adjacent to central parts of the cities).

For such abandoned areas the term "brownfields" is used according to the terminology used in advanced countries (primarily the OECD). In this connection, vacant, still not built up, and unpolluted areas are called "green fields" (traditionally in our country, under the term "green field"). On the other side, there are "black fields", i.e. the extremely contaminated areas, where all permissible limits of risk with respect to human health and eco-system have been exceeded.

ANALYSIS

In the Czech Republic, the problem of brownfields became apparent in connection with privatisation and economic restructuring processes. At first, the problem of brownfields was seen in traditional mining and heavy industry sectors, i.e., in the regions of

Ostrava and northern Bohemia, where these industries have declined very rapidly. With the continuing transformation of the economy, the problem of brownfields was encountered in other areas and locations coping with structural difficulties (e.g., Prague, Kladno, Brno and other cities with concentrated industries).

Simultaneously with the decline in manufacturing processes, dramatic changes, which still take place in some areas, occurred, concerning ownership, while stricter environmental regulations began to be enforced at the same time. However, it is important for the Czech Republic that the original operators (owners) of manufacturing sites are not economically strong enough to reconstruct and newly utilise and/or to remove old production facilities making their utilisation and offering easier due to structural changes.

One can see the occurrence of brownfields, their analysis, evaluation and solution - similarly to other complex phenomena in the region, in the light of three general aspects, which also involve three general dimensions to this problem.

Environmental dimension

The impetus for a solution to the problem of abandoned areas with damaged environment arrived in developed countries as part of environmental policy of the state. The general environmental problem of brownfields is the existing or assumed contamination of their soil (linked to the groundwater) and buildings. The problem of contaminated soil has shown to be significantly different from the problems of air and water pollution. In comparison with the methods used to eradicate air and water pollution, present methods cannot eliminate contamination of soil that occurred in the past; such methods can only reduce the occurrence of contamination in the future. So, from the environmental viewpoint, contaminated soil can either be cleaned up or mitigated by means of certain additional technical methods aimed at the removal of harmful substances in the soil.

Urban dimension

As far as urban structures of cities and their locations, the rational utilisation of their land and urban life in general are concerned, the effect of brownfields can be briefly characterised as follows:

- Brownfields negatively affect the functional utilisation of an area and they reduce the intensity of utilisation of the area of concern, which negatively affects an urban economy.
- Due to their neglected appearance, the inhabitants of and visitors to the city receive an impression of failure, social destruction and pessimism, which is dangerous for the general social and political atmosphere of a city.
- They present a hindrance to new construction according to building regulations.

- They constitute a hidden and this far undervalued potential for site development, because due to the historical development of cities they are often situated in the vicinity of valuable areas, which are important for providing the general functions of a city.
- Their revitalisation may reduce pressure for an expansion of the construction of new buildings on the outskirts of cities (the so-called green fields).
- Their regeneration may improve negatively regarded urban structures of cities (e.g., a solution to traffic problems, construction of necessary public utilities of a city-wide importance, as well as the realisation of recreational activities, the development of tourism, the organisation of exhibitions, etc.).

Economic dimension

This dimension includes a multi-layered view of the occurrence of and solution to brownfields. The land and buildings are to some degree the property of a certain economic entity, which is not economically valorised. A brownfield is not a mean for gaining revenue but, on the contrary, it means non-productive expenses for the owner (at least the tax should be paid and also costs in connection with security, etc.). The market value of any contaminated plots and single-purpose buildings is rather negative.

In a broader economic aspect, this is again unproductive bound capital. From the viewpoint of urban economy, the existence of brownfields results in negative, although in the majority of cases, indirect impacts on public investments and operating costs, while decreasing the value of plots in the vicinity, etc. [1]

BROWNFIELD AREAS AS A BARRIER TO THE DEVELOPMENT OF A TRAFFIC INFRASTRUCTURE

The solution of the problem primarily deals with town planning in connection with a social economic viewpoint. Some important features of this issue are highlighted using the example of the consequences of the shutdown of coal mining in Ostrava, where between 1994 and 1996, the extraction of coal ceased at all local collieries with the subsequent liquidation of the coal mines (34 shafts were covered up). The area of the abandoned collieries amounts to 148 ha, which is only 6.8% of the industrial area of the city and only 0.69% of the total area of the city. The mining locations are situated all over the area of the city, frequently at attractive sites and always with good traffic connections. (Each colliery is situated in the vicinity of important city traffic routes and linked to a railway siding network). Moreover, from this small area approximately 20 000 workers lost their jobs (28% employed in industry). The end of coal mining represented an important change

in traffic relationships: reduced freight transport, changed targets, directions and volumes of commuting in public mass transport. The dismissed workforce sought jobs in other sectors, primarily in services, which are usually situated on other locations than collieries. In the region of Ostrava - and as it is shown in many other cities - the brownfields came to existence from other reasons that the decline of metallurgical, engineering, chemical and power engineering industries. The quantity of such areas is not so great in comparison with the abandoned coal mines; however, such areas expand over a larger area with frequently complicated town-planning relationships. The common feature of brownfields is, regardless of their origin and purpose, they created an urban structure, either appropriate or less appropriate for the site development of cities, when they came into being. They represented a functional utilisation of an area bound to the general structure of an area with many functional relationships. They created concentrated sources and targets of freight and passenger traffic; they were linked to capacity sources and networks of technical infrastructures with their own civil engineering networks inside the area. The functional structures disappeared, but the physical means for such structures have remained.

THE RELATIONSHIP OF SITE PLANNING ON VACANT AREAS (GREEN FIELDS) TO TRAFFIC INFRASTRUCTURE

The core of the relationship between a traffic infrastructure and brownfields lies in an estimation of the localisation of new economic activities needed for the economic development of a city or a region - whether to establish such activities on new areas on the outskirts of a city or to use the existing possibilities on potentially utilisable areas within the city. Locating on new areas (industrial zones, etc.) always require building new access roads, lay-by areas, extended public transport lines and construction of new in-plant roads. Locating on brownfields does not require new access roads, but at most their adaptation, and in the majority of cases, new internal roads are not required, because the public traffic transport already exists.

PROBLEMS IN THE REGENERATION OF BROWNFIELDS

Well-balanced site development requires revitalising the abandoned areas again. Foreign experience based on long-term research into the regeneration of brownfields in Western Europe and the U.S.A. shows the following general aspects of the entire problem:

- A complex and systematic approach is important from

registration through the methodological principles of the solution to the questions of organisation and financing.

- Even an advanced market environment with strong capital investors will not lead to sufficient interest in regeneration projects of brownfields and an active organisational role by the public sector is necessary.
- Regeneration plans and programmes without public financial support (direct and indirect) have no chance of success.

Moreover, experience from abroad emphasises that an important priority aspect conditioning the interest of new investors is the location situation with respect to the settlement, the situation of the particular locations and the property's relation to a road

It is necessary to emphasize general aspects in the process of solving brownfield regeneration programmes:

- The goal is a permanent sustainable development of the area and rational utilisation of the region with respect to financing the site planning and elimination of any environmental risks;
- regeneration may contribute to solving unemployment problems in the restructured areas and boosting the economy
- the regeneration process requires the strong involvement of the public sector with regard to co-ordination, subsidies and regulations
- a condition for successful progress of regeneration is the creation of a generally effective system to support the entire process in the areas of financing, taxes, administration, etc.

In summary, the problem of brownfields includes the following starting points:

- a new utilisation of abandoned production areas is in the public interest for environmental, site planning and political reasons
- a new strategic concept is important for the new utilisation which harmonises the environmental aspects with the aspects of site development and financing the site planning
- mapping the occurrence, extent and types of brownfields in the location or region (and/or the state) should be a part of any concept
- for a conceptual solution, it is necessary to define the tasks of individual participants in the process of regenerating brownfields, which is primarily the task of the public administration (state administration and self-government) at the local, regional and national levels.

Brownfields left by agricultural production create a special group of problems. The environmental aspect will be important for these locations. With regard to the fact that these locations are situated on the outskirts of rural communities, one cannot expect economic and site planning pressures on their new utilisation for other functions.

CHARACTERISTICS OF THE SITUATION IN THE CZECH REPUBLIC

In the Czech Republic, with respect to brownfields, no detailed programme has been adopted any complex programme and the presence of brownfields has not been mapped yet. The majority of abandoned and contaminated areas left by production activities in the past have the character of the so-called "old environmental impacts" that were ascertained in connection with the privatisation of state-owned enterprises according to Act No. 92/1992 of the Code specifying the conditions for the transfer of property of the state to other persons. In this connection an "environmental audit" setting out the present situation concerning the observance of legal regulations and a relatively detailed summary of damage caused by the company in the past in the rock environment and the groundwater was required.

Negative environmental impacts caused by the companies marked for privatisation proved to be significant; therefore the state has provided financing through the National Property Fund. At present, provisions are being prepared to finance the removal of contamination ascertained after privatisation from the finances of the National Property Fund.

However, the old environmental impacts do not completely cover the entire problem of brownfields. Areas of this character could have come into existence with the new industrial activity after privatisation; further the specification of old environmental impacts does not include areas used for non-industrial activity and areas under public ownership.

Thus far, the regeneration of brownfields is in an initial stage, primarily in the large industrial agglomerations. Clean-up processes (decontamination) of old environmental impacts are taking place or in the preparatory stage on several sites. The preparation of projects for the new utilisation of brownfields is in an early experimental stage; however, there is a problem involving attempted acquisitions by investors (developers), primarily due to the tough competition for vacant areas on the outskirts of cities.

In the Czech Republic, no legal definition of abandoned and devastated industrial areas ("brownfields") exists, and the full extent of such damaged areas has not been mapped.

With regard to the complicated problem of the regeneration of brownfields, the size of the site and the environmental and economic relationships, this problem should already be solved at the strategic level (at the level of the state, regions and communities) with incremental projections in development programmes, activities and projects.

The general strategic approach to solving the problem of brownfields has already been formulated in the Strategy for the Regional Development of the Czech Republic [3]. The issue of brown-

fields is directly (in particular cases) included in the document as a vacant property affected by coal extraction and/or long-lasting industrial activities and their release for other utilisation, is conditioned by speeding up programmes for the removal of old environmental damage and the complex revitalisation of negatively affected areas. The issue of brownfields is indirectly (in a broader context) contained in the document as environmental protection. As it is apparent, the strategic trends in this document are oriented primarily towards the environmental dimension of the problem of brownfields.

Recently, a project entitled Strategy for the Regeneration of Abandoned Factory Buildings was commenced in the Czech Republic. The British consulting company Parsons Brinckerhoff is involved in the project in co-operation with Czech and European experts, and a general plan for their potential utilisation is being prepared. The preparation of five model locations is part of the work, and all the required documents, financing system and future utilisation will be set out.

Among the documents of a strategic character, one may also cite the National Development Plan of the Czech Republic and the operating programmes connected with this plan. In relation to the issue of brownfields, the Joint Regional Operating Programme and Operating Programme for Industry and Business Undertaking, which include the priorities and provisions encompassing the issue of brownfields, are also important. The possibilities for their utilisation are discussed below.

The thus far very slow start-up of the regeneration of brownfields has been caused by many circumstances, e.g.:

- the high costs of the removal of the effects of the former activity (contaminated soil, abandoned buildings and technologies),
- the frequent incidence of less than transparent ownership relationships,
- the owners do not know what to do with the property (sometimes they are not willing to seek a solution),
- the lack of capital of the original owners for developing of new utilisations,
- insufficient economically substantiated projects for new utilisations that would be attractive to new investors.

The economically demanding restorations lay in high costs for decontamination, including demolition work. These costs cannot generally be placed on the shoulders of new investors. In some cases the original producers of the contamination who are legally responsible for it, do not exist any more.

Other hindrances include financing and organisational obstacles contained in the tax system and its application, difficulties in obtaining loans, the lack of quality developers and investment advisors, complicated procedures with respect to obtaining all the construction permits, etc.

In the majority of cases, the private ownership sector is not interested in initiating the regeneration of brownfields. The reasons are quite apparent:

- legislative regulations and confessing responsibility for correction may create an unacceptable level of risk and uncertainty about escalated costs for decontamination projects,
- requirements for the future utilisation of brownfields can be limited, unknown or not binding,
- the high cost of corrective actions may result in decisions that revitalisation of brownfields is not profitable from the viewpoint of future utilisation,
- the new development of a region is often limited by other factors (the interest of parties involved in the care of monuments, technical parameters, public opposition, etc.) that limit future investors,
- vacant sites ("green fields") and characteristic features of peripheral and suburban areas (the present cost of real estates) are more attractive with greater competitiveness for investors.

The public sector is not sufficiently experienced in management of the revitalisation of brownfields, and in addition, the potential of the institutional and organisational forms for the implementation of such projects has not been verified in the Czech Republic yet.

GENERAL PROCEDURAL SCHEME FOR THE PREPARATION OF REGENERATION

Principles of the proposed new utilisation of brownfields

The assessment of a location should include information about:

- the permissible (potential) type of utilisation according to the site plan
- the existence of contamination, its form and intensity
- ownership of the property and buildings
- infrastructure problems (types and conditions of any civil engineering network)
- economic problems

The described and analysed condition of the area appurtenant to the location is supporting material for the formulation of strategic goals, trends and methods of development.

The next step will require evaluating the interests in relation to the location, which includes

- marketing research on the interests
- formulation of developmental alternatives
- preparation of potential projects
- preparation of an analysis of the feasibility of projects

Each of these items involves more extensive, costly and complex work. The public sector will chiefly participate in the formulation of

developmental alternatives, primarily through regional and local development and site planning programmes.

For the methodology of the regeneration as well as the reconstruction of industrial factories and plants, the stage of the analyses and investigations of the present conditions of areas and buildings and their linkage to broader functional elements, such as the linkage to habitations, traffic and technical infrastructure are important. Moreover, the material and space valorisation is important as well. The types of potential new utilisation of areas include all residential functions, industry, services, recreation and sports areas, housing, education and culture.

In addition to traditional forms of manufacturing activity, such as factories, workshops, warehouses, etc., it is necessary to take into account other types of industrial areas for economic activities while seeking the utilisation of brownfields: industrial parks, technological parks, crafts parks and yards.

When searching brownfields, it is necessary to define their limits for potential development. These limits represent site planning constraints and conditions for the utilisation of particular areas to be specified on the basis of the information gathered.

OPPORTUNITIES FOR THE POTENTIAL ACQUISITION OF SUBSIDIES FOR ACTIVITIES AND PROJECTS FOR THE REGENERATION OF BROWNFIELDS

The preparation of activities for the regeneration of brownfields may be based on many nationwide programmes supporting regional development that also include the issue of brownfields.

Programmes supporting the regional development of the Czech Republic [2]

Subsidy title no. 1 -Preparation for investments in an industrial area and other buildings for business undertaking, revitalisation and the revival of obsolete and unused industrial areas, where, among other things, projects for the utilisation of temporarily unused industrial areas and other spaces are supported along with the reconstruction of temporarily unused buildings appropriate for business undertakings, construction, extension or reconstruction of a technical infrastructure in these industrial areas and other spaces and/or areas in their vicinity needed for their functioning.

Subsidy title no.2 - Support of investments for developing tourism including actions directed, among other things, towards reconstruction of technical and cultural monuments.

Programme for supporting development of industrial zones

This programme is oriented towards the preparation of industrial zones, unused industrial areas and the so-called brownfields, for the construction of potential rental space and support of the improved

competitiveness of industrial zones within an accreditation sub-programme.

Potential for obtaining support for the regeneration of brownfields from EU Structural funds during the planning period of 2004 - 2006 [4]

The issue of brownfields is included in the following operating programmes:

The Joint Regional Operating Programme (JROP)

The Operating Programme for Industrial and Business Undertakings (OPIBU)

The following priorities are included in JROP to the subject of brownfields.

Priority 2 - Regional development of infrastructure, Provision 2.3-Regeneration and revitalisation of selected cities.

Within the provision a limited number of comprehensive investment projects for the cities will be supported, which will improve their general environment and be directed towards the regeneration and revitalisation of declining cores of the cities or negatively affected city areas (brownfields). From a material aspect, the reconstruction or completion of selected buildings will be supported by a detailed landscaping of public areas, the restoration of technical infrastructure and local roads within the area.

Priority 4 - Development of tourism, Provision 4.2 - Development

of an infrastructure for tourism

Sub-provision 4.2.2 - Support of the local infrastructure of the Czech Republic.

Within the sub-provisions, more comprehensive projects of regional or local importance oriented, among other things, towards the revitalisation of cultural, technical and industrial monuments and the cultural heritage for their utilisation in the development of tourism, construction or restoration of public utilities in the sports sector, recreation, etc., will be supported

The Operating Programme for Industrial and Business Undertakings includes:

Priority 2 - Restructuring the industrial production base

The preparation of areas and other buildings for business undertakings is a top priority supporting the preferred utilisation of existing industrial areas and premises, the so-called "brownfields", including abandoned industrial buildings in accordance with the law on the protection of the agricultural soil fund. The establishment of new commercial zones in the vicinity of the cities (the so-called "green fields") will be supported to a limited extent only.

Despite the mentioned possibilities for support, the utilisation of brownfields is still more of a possibility than a reality in solving the problems of the traffic infrastructure.

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