

LIFELONG EDUCATIONAL PROJECT ON BROWNFIELDS

LEONARDO DA VINCI PILOT PROJECT CZ /04/B/F/PP-168014



Education and Culture

Leonardo da Vinci

BROWNFIELDS HANDBOOK

**Cross-disciplinary educational tool focused
on the issue of brownfields regeneration**

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Authors:

Dr. Uwe Ferber, Projektgruppe Stadt +Entwicklung Leipzig

Dr. Paul Nathanail, University of Nottingham

Jiřina Bergatt Jackson, IURS Praha

Marcin Gorski, Ph.D. CE., Rafal Krzywon, Ph.D. CE.,

Lukasz Drobiec Ph.D. CE., Silesian University of Technology

Doc. PhDr. Dagmar Petřiková, Ph.D., Prof. Ing. arch. Maroš Finka, Ph.D.

Editing:

Dr. Uwe Ferber

Proofreading:

Dr. Paul Nathanail

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1. Acknowledgements - BROWNFIELDS: LIFELONG EDUCATIONAL PROJECT (LEPOB)

Project Aims

LEPOB is designed to deliver missing expertise in the area of 'brownfield' reuse/regeneration in the fastest, most direct and effective manner, via regionally available programmes. The project seeks to disseminate relevant European expertise and provide a mutually beneficial forum for exploring and solving 'brownfield' problems specific to Central Europe. The project materials are designed to foster transfer and adoption by other countries/projects (we are currently seeking potential partners from the Baltic and Balkan regions).

Findings

Conclusions regarding 'brownfield' reuse/regeneration proposed by other EU projects, such as CLARINET, CABERNET and WELCOME, suggest that one of the main barriers to the regeneration of derelict and polluted land appears to be a lack of stakeholders' knowledge and available training/education. Interdisciplinary approaches are essential. Professional practitioners, trainers, administrators, decision makers, investors and potential investors are all in need of materials and training in the principles of sustainable urban regeneration. Such materials remain unavailable (even in established EU countries many aspects of 'brownfield' regeneration are rarely covered by coherent multi-disciplinary teaching modules).

LEPOB's Solution

This project addresses the interdisciplinary issues of 'brownfields' by utilizing cross-professional expertise in Central Europe whilst offering tools suitable for continual professional education.

Educational packages produced by the project address 'brownfield' regeneration issues using cross-thematic and cross-professional approaches. All training materials are being tailored to specifically suit Central European training formats and contexts. Materials are designed principally to accelerate the immediate knowledge of chartered professionals. These are the professionals who work in a broad range of posts as consultants, civil servants, local government administrators, regulators and policy makers. These professionals are in a position to use and implement the knowledge gained through this project / project materials immediately.

The project will create generic materials suitably designed for ease of transfer to other countries. From these materials country specific versions can be created. As a part of this project Czech, Polish and Slovak language country specific versions will be created. These country specific materials are offered for use to relevant bodies and locally funded projects. All the teaching modules will be demonstrated within teacher taught sessions, which will take place in autumn 2005.

LEPOB's Dissemination

As part of this project, those partners representing Central European professional and educational institutions would submit additional locally funded projects which will use the materials of this project. Course materials will also be suitable for adaptation and extension to university graduate education across Europe. Additionally the project will produce suitably experienced local trainers.

LEPOB's Communication

A regional website will be created, where the best practises will be published - handbook, generic course materials and local language versions will be available to be downloaded, free of charge.

Partnership:

VŠB – Technical University Ostrava	CZ
IURS Praha	CZ
ČKAIT Praha (CZ Chamber of C.E.)	CZ
Politechnika Slazska Gliwice	PL
SPECTRA, TU Bratislava, FA	SK
University of Nottingham	UK
Projektguppe Stadt+Entwicklung Leipzig	DE
SKSI Bratislava (SK Chamber of C.E.)	SK
Polish Chamber of Civil Engineers	PL

Contact on LEPOB

VŠB-TU Ostrava, FAST
Ludvíka Podéště 1875
708 33 Ostrava-Poruba
Czech Republik

www.fast.vsb.cz/lepob



2. Introduction

(author of the chapter Jirina Bergatt Jackson)

Brownfields are produced as a regular outcome of industrial change and restructure in any country. However, the dynamics of change and the circumstances of transition from socialist to market economies have left many Central European countries with an exceptionally large burden of brownfields along with an inability of their markets to “recycle” these properties into other productive uses.

The reclamation and redevelopment of brownfield sites will require substantial resources over a period that must be measured in decades. However, brownfield revitalisation can make an important contribution to local economic development by addressing key social and environmental issues, particularly in regions where unemployment is high. For Central European cities, brownfields are of a scale and seriousness that impinges substantially on their urban competitiveness. Thus, a problem that might be justifiably less central on an overall EU urban agenda, is or should be at the absolute centre of attention in Central Europe - mainly due to its direct effect on national competitiveness. Brownfields in Central Europe also illustrate how one pressing urban problem and its remedy are regarded in the regional context. It points to the promises and deficits of the EU accession process in assisting in these solutions. It highlights the many levels at which changes must take place in order to effect change on complex (multi-disciplinary and multi-stakeholder) economic development and planning problems in a transitional economy. It opens an untapped area of vast needs for education and subject knowledge transfer.

2.1 Who was this handbook written for?

This handbook was written to help broaden the understanding of engineers and other

related professionals in brownfield reuse. By their own description engineering professionals are organised and precise people, expecting information based on logic, evidence and numbers. Their knowledge is usually very exacting, deep and specialised and in their specific training they generally expect information which will make them more focussed and specialised in their own field.

This handbook does not do that - it was designed not to deepen the technical knowledge of an engineer, but to broaden and expand this knowledge, giving him/her an outlook and understanding related to urban and brownfield land and property reuse issues at a level which is well above normal professional focus. One may ask, why an engineer wants or needs to know all that, why should they read long text or sit through hours of courses?

Would it make them a better engineer if they understood other broader aspects of the construction and redevelopment process? Would it make them more useful and marketable to their clients if they understood their development objectives? Can they proceed though permitting with greater ease if they are aware of strategic objectives that a community may have for urban land reuse? Would they integrate better into design teams if they have a deeper understanding of the roles and the issues that other professionals have to deal with? Would it open new markets for them if they were conversant with the new opportunities that exist in the urban land reuse market? Would it make them bid for jobs that they would not previously have bid for if they can talk the "development" language with clients? Would it make them develop business interests that they did not previously consider, for example the risks and financial aspect of urban land reuse?

It is up to the individual engineer to judge what continual professional education means for them, whether it is only a deepening of

existing knowledge or whether it is also expanding horizontal understanding in other subjects, some of which this handbook deals with. At an basic 'awareness raising' level (sorry we can not make you into a brownfield expert after reading just 100 pages) this handbook gives horizontal information related to various aspects of brownfield land reuse that an engineering professional may not normally encounter in the normal course of their work and which is usually handled by other professionals. However, brownfield solutions mean working in multidisciplinary teams and as a team member in whatever capacity, an engineer would meet such issues and would deal with other professionals solving them. Disciplines such as development, real estate, planning, finance and environmental remediation or issues such as risk, liability or public participation all touch brownfield reuse in their own terms and also touch on the specific role of the engineering professions once he/she is engaged in brownfield reuse project.

We sincerely hope that engineers will find the information in this handbook useful and that it will broaden and expand their overall professional outlook and understanding.

2.2 Why was this handbook written?

This handbook was conceived to assist in closing the educational gap that exists, for various reasons, in the subject of brownfield reuse and regeneration in Central Europe. The handbook is directed towards practising professionals, chartered engineers, engaged or about to be engaged in a process of brownfield reuse. The handbook is supporting material for a wider brownfield course, designed to be offered as continual professional education modules within the Central European region. Both this handbook and these courses were produced by project LEPOB that ran from an October 2004 until September 2006 and was financed under the Leonardo da Vinci program.

The handbook was written because no other similarly holistic handbook was available. Also, no other existing handbook had a specific emphasis on the Central European region. Since the beginning of the project it was agreed that there would be one generic handbook with its Central European emphasis written in English. From this master version other versions containing country-specific particulars would be produced, thus breaching the language barrier that some professionals may have encountered. It is envisaged that project LEPOB partners will produce Czech, Polish and Slovak copies of this handbook adding their local systems and details as necessary.

As this handbook was financed under the Leonardo da Vinci program, its generic version is being offered freely for exploitation by other parties, who can use it, translate it and who may wish to make their own country-specific local language versions. Partnerships are also offered by LEPOB project partners to formulate new projects reusing this handbook and other LEPOB project products. We think that such a form of dissemination may be especially useful in the Balkans and the Baltic region, where similar conditions and problem prevails.

2.3 Structure of the handbook

The handbook is divided into 12 sections where chapters 3-11 each cover a separate issue. Chapters are complemented by a number of "boxes", which illustrate issues in detail. The text is accompanied by a number of useful flow-charts, figures, tables and illustrations which provide useful tools and information. References are given on other pieces of available expertise and know-how.

However, we must point out that the subject of brownfields is constantly developing. We have taken the utmost care to describe up-to-date information, but during a time frame of over two years some of the information and best practice that this handbook illustrates may be out-dated or irrelevant.

3. Overview: Brownfield Redevelopment as a stimulus to Planning and Development (author of the chapter Jirina Bergatt Jackson)

Learning outcome – "awareness level".

After reading this chapter you will be aware of the following:

- o The definition of a brownfield and the types and classification of brownfields that exist
- o Why it is not easy to promote brownfield reuse
- o What forces reflect on brownfields
- o The need to plan with brownfields
- o The need for measuring and sizing the issue
- o The main stakeholders in brownfield reuse
- o Why it is important to learn from the mistakes of others

The question of brownfield reuse has emerged to a prominent place on the political agenda in developed countries since the 1970s. It is now strongly linked to a more general agenda of sustainable urban and regional development. Brownfield reuse not only strengthens the vitality and efficiency of city centres but also assists in taking the developmental pressure off agricultural land („greenfields“) located at the edge of cities. Effective, economic and sustainable land use also directly supports national competitiveness. Sustainable land use, sustainable urban agendas, sustainable urban policies, sustainable environmental, economic and cultural development all touch on and address the issues of brownfield land reuse.

3.1 What is a brownfield?

There are many definitions of what a brownfield is and understanding varies mainly between the American and European perception of it. The European perception sees brownfield land as derelict, under-utilised or vacant

land that may or may not have environmental damage, on which previous use has ceased or subsided and which the market was not able effectively reuse without some sort of an intervention. What is and what is not a brownfield also depends substantially on local circumstances. What appears to be brownfield by one standard may be regarded as a budding enterprise by another. Also it is important to realise that some brownfield sites may still be partially in use. Although many brownfields are no longer in full use, the standard description “under utilised” implies that sites in this category are unlikely to be wholly in use. One example of this may be a commercial operation which is rationalising or reducing staffing levels. In such a case, that area of the site which is no longer used by the owner is classed as brownfield, even if other parts continue in productive use. The fact that we can not absolutely and exactly define what a brownfield is and what it is not, presents one of the barriers to their reuse. Here is a definition broadly now accepted in the European space.

Brownfields are sites that:

- o have been affected by the former uses of the site and surrounding land
- o are derelict or under used
- o have real or perceived contamination problems
- o are mainly in developed urban areas
- o require intervention to bring them back to beneficial use



Fig. 3.1



Fig 3.1., 3.2 Sidings of steelwork plant and ancillary buildings in Krakow.
Photos: archive IURS, author Y. G. Garb.

3.1.1 Recognition that the problem is a problem!

At a basic level, the absence of recognition of the problem and a history of this problem is a problem! Initially it may not be clear that a dilapidated railway siding here, an abandoned army barracks there and a contaminated factory in a third place all constitute a single type of problem. A further consideration is the lack of any data and measurements on how extensive the brownfield might be. This is impossible to say when no clear-cut definition of under-used land, the various types and parameters of such land, registry of sites, nor estimate or mapping of their extent is available. Even with the dawning recognition of brownfields as a problem with a name, there is still confusion and fragmentation regarding the locus of responsibility, leadership, and coordination for mobilisation around the issue.

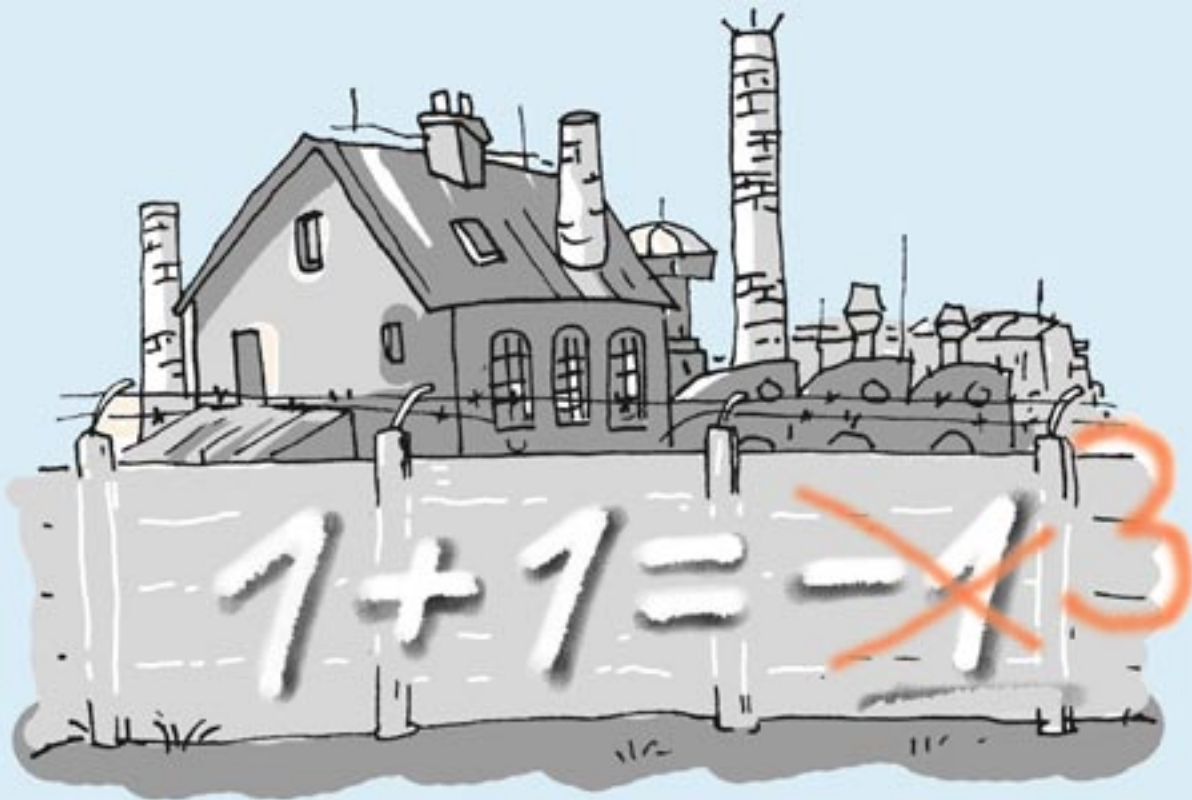


Fig. 3.3

Brownfield types by their previous use

With the change of political regime in the late eighties much of Central European industry found itself rapidly redundant, unable to compete in terms of efficiency and products offered. A spiral of decline commenced. As their old markets disappeared companies were sold in various types of privatisation processes but these were often short-lived serving to deepen the dilapidation of property. Indeed, sometimes these sales were not intended to yield a functioning firm, but were for the purpose of asset stripping. Some properties were rented for other uses in a dilapidated form, and in an oversupplied market; these secondary uses (car breakers, for example) could further contaminate the land. The physical degradation of these sites was often accompanied by a degradation of their ownership status and integrity. Through the privatisation process and because owners and bankruptcy administrators tended to dispose of properties in small

individual lots, they often became less viable purchases for redevelopment. Other sites became untenable as they did not have clearly acquirable ownership titles, or became securities for mortgages, often highly overvalued in comparison with their actual value. Real-estate and ownership complexities deter new activities and investment away from these sites. This process resulted in numerous industrial brownfields.

In addition to post-industrial brownfields, additional brownfields arose through demilitarisation: the emptying or disuse of large bases in and around CEC cities. Extensive railway lands brownfields and siding areas, often quite polluted and drastically underused, are located in very centres of many Central European cities. Numerous agricultural brownfields can be found in smaller Czech and Slovak communities as remnants of the era of collective farming. With population decline and health,

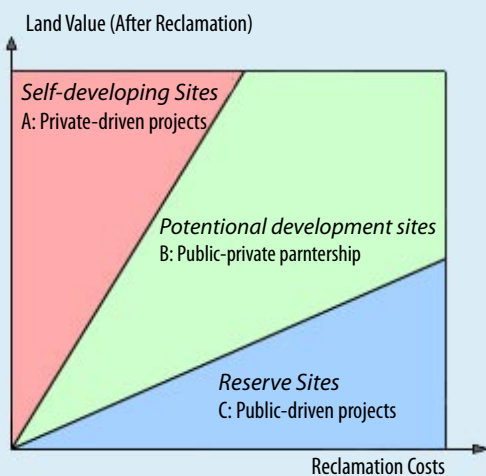
sport, culture, security or educational system restructuring there will be all sorts of institutional, leisure and cultural brownfields entering the real estate market. Vastly under-invested and dilapidated housing stock can also be termed as residential brownfields.

Brownfield type and categorisation can be devised and analysed in several ways. Here are shown two such classifications. Table 1 shows classification by previous use. Table 2 classifies sites in accordance with their likely commercial viability in accordance with the broadly accepted model from the CABERNET¹ project.

Table 1: Brownfield type by previous use

- Industrial
- Military
- Railway and transport
- Agricultural
- Institutional (schools, hospitals, prisons)
- Commercial (shopping centres, offices)
- Cultural (culture houses, cinemas)
- Leisure (sports ground, parks, open space)

Table 2: Brownfield type by likelihood of reuse



¹ See also www.cabernet.org.uk

Even when a problem is recognised solutions are not easy

Even when it is realised that there is a problem, a solution is not often straightforward, easy or simple. The difficult task of combating brownfields is demonstrated by an example of a prolonged national effort in England. England is one of few countries where long-term land-use policies, brownfield reuse support policies and programmes, and close brownfield reuse monitoring exists on national level. This is why long-term comparable data, available for examination exists. After 30 years of a focussed national effort that dealt annually with the reuse of hectares of brownfield land, a very small decrease in the absolute size of brownfield land was actually achieved. The “winning” in this case was that brownfield land has not increased and that many hectares of land were rehabilitated and put back to beneficial use.

Target 60% of all new housing on brownfields



Fig. 3.3 Cabernet bath tap picture

3.1.2 Terminology and the impact of terminology

The word “brownfield” is translated into many languages in many different ways. This may result in substantially different understanding when other nations describe their own brownfields. For example, in Poland the term “teren poprzemysłowy” implies that brownfields are solely of industrial origin, which they are not. Therefore there may be some difficulty in describing a non-industrial location using such a local terminology. On the other hand, in the Czech Republic a fixed Czech term as an equivalent translation for brownfield does not exist. The terminology here varies from

ministry to ministry, each using its own local description.

It is important to add that the term “brownfield” is appropriate when addressing and attracting national attention to the issue or making the issue a regional or local priority. However, once we are looking for investors it is inadvisable to continue to talk about brownfield land, as for many investors the term “brownfield” may imply polluted and difficult plots. At this stage it is advisable to drop the “brownfield” terminology altogether and to talk of, for example, “urban land reuse”.

3.1.3 Application of subsidiary principles

However important the economy of the land use may be in the terms of European space, in terms of the subsidiary principles it is down to individual nations. Between individual nations, local standards, practices, regulations, habits and perceptions vary widely and this is why land-use and brownfield comparative data are difficult to come by. In most of these nations then the local land use is, by the same subsidiary principles, delegated to the local communities. At the same time national spatial policies, especially in the new member states, are still in their infancy.

Land is a finite and threatened resource

Urban land is not typically considered a finite threatened resource, in the same way as the living environment, minerals, water or green space are. While brownfields can directly affect several media (water, soil and even air), they can also lead to more subtle environmental impacts (hampering the energy and infrastructural efficiency of urban forms, facilitating agricultural land conversion), as well as social and economic impacts. These are far more difficult to quantify, as are the benefits of brownfield remediation. Relatedly, the relevant indicators and benchmarks associated with other EU priorities are less readily available for land-use or brownfield issues. The reuse

of brownfields involves the private sector almost intrinsically in a far deeper and more sophisticated manner than other issues. The gap in overall systematic brownfield information is striking given not only the importance of the issue but also the progress that has been made world-wide on other environmental indicators and information. Where environmental land-related objectives are widely supported by EU and other international programs, they have mainly focused on open space and farmland or on air, water and coastline quality - i.e. on media that could potentially travel across borders. In these spheres watchdog bodies and monitoring systems that produce regular data have been established. But registers or analysis of under-performing and potentially polluted urban land and buildings have not received the same kind of support, despite their importance for urban redevelopment.

Planning with the problem

Without understanding their brownfield profile, inventory and analysis, communities can not grasp the issue and can not prepare active measures to alleviate and address their brownfield problem. This is alarming, especially when one understands all the barriers that brownfield sites have or realises that only a limited percentage of this land can actually be reused for modern industrial and commercial use. Only a certain percentage of such brownfield land is sufficiently well located and is able to be rezoned for a higher use that may be more compatible to its present location. Other brownfield land (even land with no environmental damage, ownership or real-estate problems) is often in a bad location or is so superfluous to the market that there will appear to be no chance for any development on it. Our spatial, strategic and economic planning needs to address all these realities.

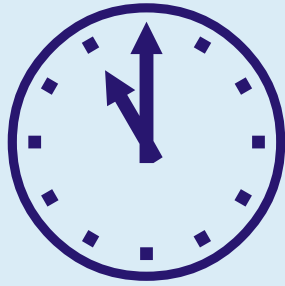


Fig. 3.4, 3.5, 3.6 An example of regeneration

3.1.4 Addressing any technical assistance needed

As economic land use issues are by the subsidiary principle a national responsibility they were not, and today are still not, a part of the EU accession priorities. This is why during the accession stages of the new member states, priorities were diverted away from any spatial issues or land-use economy issues and focused solely onto issues necessary to fulfil direct accession obligations. Not being an accession priority has made it also difficult to channel enough EU Technical Assistance (TA) to land-use and brownfield revitalisation issues, or to channel this TA into the correct institutions. For example, in Czech Republic brownfields the TA was channelled solely into an investment promotion agency, CzechInvest, part of the Ministry of Industry. Only after 4 years of such a TA and as a result from one of its projects it was realised that:

- brownfields are not solely problem of industry or a problem that a single Ministry can solve.
- effective solutions can be achieved only through broad and effective cross-institutional, cross-professional and cross-departmental co-operation and by applying correct and careful priorities.
- there has to be direct governmental responsibility and a ruling ministerial body that can drive towards achieving solutions.
- the main “movers” of the issue should be regions and communities and they have to reflect this in their strategic documents.
- brownfield reuse needs to appear in national, regional and local priorities for the 2007-2013 structural funding.
- regions and communities have to be enabled by training to grasp these issues correctly.
- a suitable national brownfield strategy, legal framework and primary finance has to be provided at a national level.
- responsibility for addressing these issues should be set at a government level.



The importance of timing

But even a relatively straightforward brownfield project takes three or four years to prepare and put together. For local authorities to benefit effectively and usefully from the next generation structural funding, regions in co-operation with their local authorities, firstly have to identify, size and analyse the actual type of brownfield problem they have, set a suitable strategy then start identifying and preparing projects to suit these priorities.

3.1.5 Social and economic restructuring forces

Brownfields are created particularly by the forces of social and economic restructure. Dilapidated land, slack standards, visual blight and symptoms of chronic unemployment and community disintegration have a detrimental economic and physical effect on their surroundings. They deter nearly all types of inward investment and push development onto greenfield sites. The appearance of brownfield sites is also closely connected to the transition of an industrial society to a post-industrial one. Such pressures bring with them substantial change. These changes are not restricted to the economy and economical formats but also to spatial standards and to whole lifestyle modes. These new forms of activities should be, by a policy and as a priority, channelled onto brownfields. This is in order to secure the new economy and as a way of reuse in the post industrial society where there is less space needed for production and more space need for services, consumerism and leisure.

3.1.6 Urban de-concentration and population changes

Central European brownfields must be also placed in the context of overall population decline and of unlimited greenfield development for commerce, industry and housing. Many cities blighted by economic decline are losing people, activities and capital, partly due to declining population numbers and partly due to competition of sprawling peri-urban areas; hinterland communities feel the challenge to their development potential even more strongly.

Budapest, as an example, has a large amount of brownfield sites. Over the last decade and a half it has lost 200,000 residents, or 10% of its population. Greenfield development is extensive, with the local authorities around the city able to develop such sites independently with little consideration of metropolitan-wide strategic plans or needs. There were and still are few policies to enable brownfield reuse or to stop the de-concentration trend. This applies to many other cities. Despite evidence of declining population and de-concentration trends, city planners are carrying out long-term planning based on population growth scenarios. Such de-concentration processes also have to be considered in the context of overall brownfield redevelopment potential as not all the brownfields are located in the growth areas. Policies and tools are therefore needed to channel investment, people and activities back onto brownfield land.

3.2 How many brownfields have we got in our community?

3.2.1 Sizing and comparing brownfields

Most of our communities only now realise that they may have a brownfield problem. Within their previous socialist experience such a problem did not arise and in their recent post-socialist experience these issues have not been so far adequately addressed. Yet there are in general no common approaches to brown-

field inventories or classifications². This is why the available national data on number and types of brownfields, if they exist, are not fully comparable and benchmarking of one region against another is very difficult. Most of our communities do not know how many brownfields and what types they have. Very few communities have a comprehensive under-

standing or analysis of their own brownfield situation. But to address this issue correctly they need not only to know but mainly to understand and prioritise their reuse correctly, as there will be far more brownfields than finances to fix them and more importantly, activities to fill them.

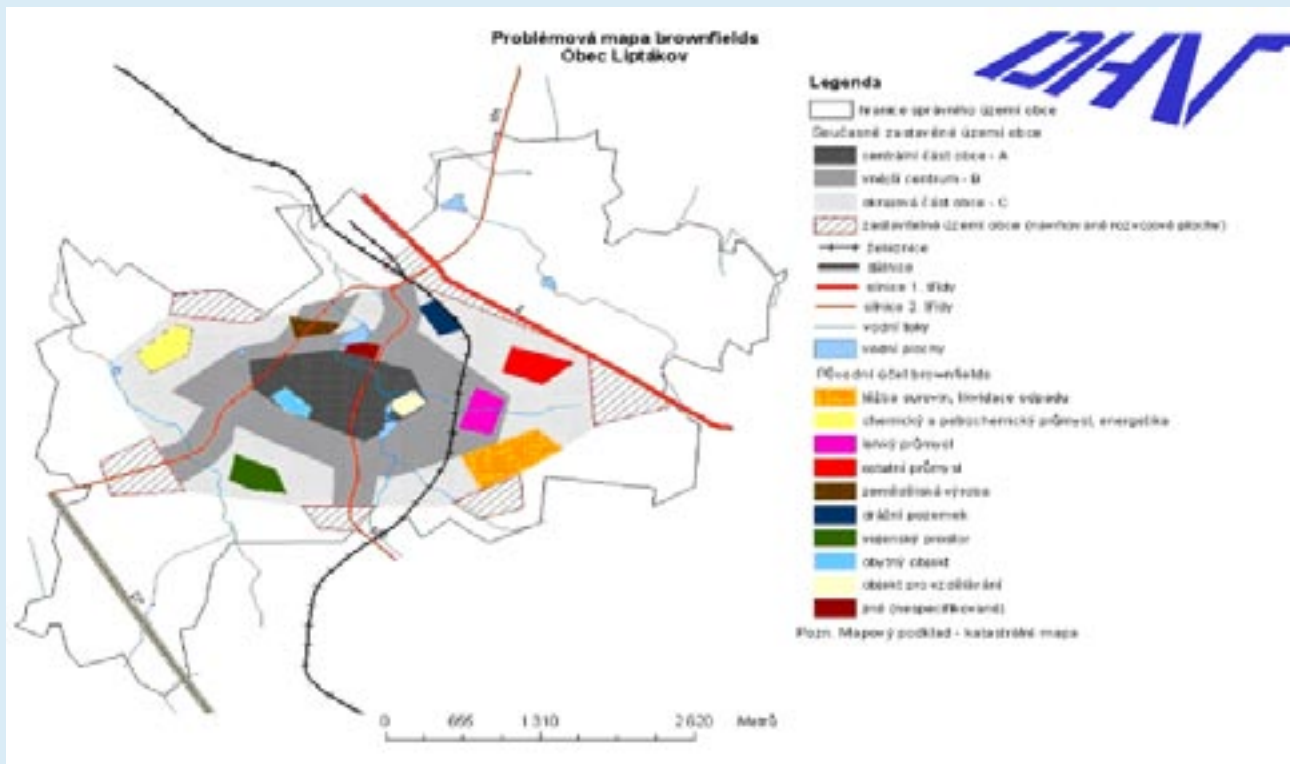


Fig. 3.7 Schematic plan analyzing brownfields in Říčany, Czech Republic. Such a map is a part of brownfields inventORIZATION methodology developed in the Czech republic for community use. See also www.brownfieldsinfo.cz. Source: Ing Arch Bařinka, DHV CR, spol s.r.o (obr. schema1)

3.2.2 Who is the actual problem holder?

One would naturally assume that the actual problem holders are the brownfield owners. Brownfield owners and their attitude to reusing their brownfields may vary, but unsolved brownfields oppress the entire community. Unresolved brownfields deter investors, reduce the value of surrounding property and cause further decline of the immediate sur-

roundings. This is why the communities, cities and their local authorities have to take a proactive role in:

- brownfield identification
- brownfield effects mitigation
- helping, advising and supporting owners willing to deal with their brownfields
- brownfield reuse promotion
- land use and planning activities
- public demonstration projects on brownfields
- prevention of new brownfield creations

² There are first attempts to unify an approach to brownfields through EU financed projects such as RESCUE or networks such as CABERNET. There are also number of best practise transfer projects financed from various INTERREG.

As shown, brownfield problems ultimately reside in local communities and local authorities are the key stakeholders in addressing these problems. In Central Europe, there is often a lack of awareness of the issue at the local level, and even very well informed and willing local authorities are often stymied on several fronts:

- It is the national government and legislators that must formulate and approve necessary amendments in the legal framework.
- Finances are in the hands of private financial institutions and state agency programs.
- It is the regions that set the priorities for structural funding.
- Properties are in the hands of private owners.

Thus, until the national capacity on brownfields has matured only those local authorities with high initiative, the capacity for rapid learning and the creative use of very limited tools and resources, will be those who can effectively regenerate their brownfields.

3.2.3 Who are the other main actors in the revitalisation of brownfields? Actors / stakeholders and interest groups in brownfield redevelopment.

In our previous paragraph we have already identified local authorities as one of the key stakeholders in the revitalisation of brownfields at the local level. However, stakeholders in brownfield reuse and revitalisation are many and they can influence brownfield reuse from several different levels. Here we illustrate some of the possibilities. To achieve a workable solution different levels of stakeholders have to interact. But without personal initiative (private or institutional) supported by suitable strategies the issue is usually being only nibbled at and not properly solved.



Fig. 3.8, 3.9, 3.10 An example of various stakeholders activities, that took place over a number of years on the site of Vaňkovka factory site in Brno, now redeveloped into a shopping mall. Photos : Ing arch E Staňková, Vaňkovka NGO

Table 3: Stakeholders	
<p>Stakeholders on a personal level</p> <ul style="list-style-type: none"> • brownfield owners • problem solving consultants • specific NGO • individual citizens • individual administrators 	<p>Stakeholders on a local level</p> <ul style="list-style-type: none"> • brownfield owners • local investors • local authorities • local statutory regulating bodies • financial institutions • technical and real estate consultants and lawyers • local citizens • local community
<p>Stakeholders on the regional level</p> <ul style="list-style-type: none"> • regional self-governing authorities • regional financial bodies and institutions • regional development agencies • regional statutory regulators • regional investors • public within the region 	<p>Stakeholders on the national level</p> <ul style="list-style-type: none"> • government • parliament • national decision making and legal framework formulating institutions • national regulators • national financial institutions • national investors
<p>Stakeholders on EU and global level</p> <ul style="list-style-type: none"> • EU commission, EU parliament • EU departments • global investors • global finance • global brownfield owners 	

3.2.4 How to do it or not to do it?

Brownfield reuse and revitalisation is, as we have already indicated, a complex and not an easily determinable issue. In other countries, for some years, there has existed a number of different examples of approaching it. In some countries the issue is tackled by massive national programmes, supporting national/regional investment and the building of new institutions. In other countries it is being addressed mainly by providing a suitable legal framework and regulatory system, that allows private initiative and demands private respon-

sibility and remedial action. Examples of what to do and how to do it are therefore not easily transplanted as there are differences not only between individual national legal frameworks, but also between the individual national institutional capacities, national ways of moving and co-ordinating issues and national emphasis on role of the state. To choose a correct model is not always easy, especially for an issue as broad as brownfield reuse and revitalisation. What is also important to remember is that revitalisation of brownfields is also being “learned” mainly by doing. Those who “do”

will inevitably from time to time make mistakes from which they will also learn. There is now however over 30 years worth of experience available to draw on from the approach of other countries to brownfield revitalisation. There is therefore also over 30 years of “mistakes done by of others” to review, which should offer some prevention against falling into the same traps whilst searching for ideal brownfield reuse and revitalisation solutions.



Fig. 3.11, 3.12, 3.13, 3.14, 3.15, 3.16 Photos and illustrations : Where not stated otherwise Ing. arch E Staňková, Vaňkovka NGO

3.3 Flow Chart – Overview of brownfield redevelopment process – necessity for an integrated and interactive approach

Table 4: The Brownfield Regeneration Process

The Brownfield Regeneration Process

Source : Parsons Brinckerhoff (2004), Czech Brownfield Regeneration Strategy, CSF, PHARE project EuropeAid/113183/D/SV/CZ, (August 2004)

Stage	What it Means in Practice	Implications for Public Sector
Reclamation	Restoring the site to conditions broadly equivalent to 'greenfield'	<p>Cost can be high and if they are not justifiable for a developer, then public funding has a key role to play here.</p> <p>Without public sector action (and funding) at this stage, redevelopment is most unlikely to take place.</p>
Project definition & preparation	<p>Risk analysis and site assessment</p> <p>Development of work programme (costs/timescales)</p> <p>Securing funding and any necessary permits</p> <p>Selection and appointment of contractors</p>	<p>These tasks need to be carried out and agreed with the relevant authorities before any significant work can start on site.</p> <p>There will be issues of tendering (and perhaps state aid) in the appointment of contractors, particularly where EU funding is used, and positive steps need to be taken to avoid such problems</p> <p>Clean-up standards will be set at this stage by the Environmental Agencies.</p>
Demolition & clearance	<p>Demolition & removal of buildings and other structures</p> <p>Removal (where appropriate) of underground structures</p> <p>Dealing with specific environmental issues (asbestos etc)</p>	<p>This can be a high-cost item, particularly where underground structures are involved.</p> <p>Need to ensure that site assessments are comprehensive, and cover environmental issues like oil and asbestos.</p>
Clean-up of contamination	<p>Clean-up (or removal and disposal) of contaminated soils</p> <p>Clean-up of contaminated groundwater</p> <p>Removal/treatment of wastes from former operations</p>	<p>For sites with significant contamination, this will be the main component of reclamation costs.</p> <p>Timescales can be long (several years for a complex site), and a phased approach may be appropriate.</p> <p>Need to use most appropriate treatment techniques and technologies (best practice).</p>
Restoration and landscaping	<p>Ground stabilisation (if this is an issue)</p> <p>Landscaping of site (landforming, grass, trees etc)</p>	<p>Depends both on state of site and on planned end-use.</p> <p>Key activities for making the site visually attractive and so 'marketable'.</p>

Table 4: The Brownfield Regeneration Process

Redevelopment	Completing the transformation from an under-used brownfield site to a site whose economic potential is being fully exploited.	Redevelopment may be carried out by the public sector (for its own use), by the private sector, or through a public-private partnership. Some public investment (e.g. guarantees, infrastructure) may be needed, even for some private-sector redevelopment projects.
Infrastructure and services	Access roads, site roads, car parking, street lights etc. Water supply, wastewater (sewerage), gas, electricity, heating. Other services (communications, IT etc)	Some aspects may be included within the Reclamation phase. Some costs may be covered by local government or utility companies (statutory obligations).
Building construction	Normal construction project.	Only relevant where public sector wishes to use the building, or to construct 'speculatively built' buildings for rent or sale, or where inherent property market failure needs to be addressed.
Operation and maintenance	Particularly where building is to be let, rather than sold on or used by owner-occupier.	Most relevant where public agency is the landlord. May also need public support for marketing or rental income to help overcome market failure.

Questions to facilitate further learning that will help you to reach the learning level of “understanding”

- Q1 Discuss with others what is in your country the term for brownfields and write down your local brown fields definition. If there is not a definition discuss with others what it should be and write it down.
- Q2 Discuss with others and write down what are the main sources of brownfield - related information (books, webpages, articles, conferences, course etc...) in your country and write them down.
- Q3 Discuss with others and write down how brownfields are incorporated into your local/regional/national planning and economic development documents
- Q4 Discuss with others and write down whether and how communities in your country record their brownfields - if there are inventories, please describe whether a common methodology is used to collect data and who makes and manages the inventories
- Q5 Discuss with others 3 local projects realised on brownfields and research the main barriers these projects encountered during their design process and their realisation, describe the role and actions of the individual stakeholders to these projects and write the 3 case studies down.
- Q6 Discuss with others and write down the lessons what not to do you learned while researching the 3 case Studies.

BOX 1: Brownfields and their historical background³

Historical background to Central European cities and the opportunities that brownfields present

Most Eastern and Central European cities, mainly because of their history and the features of transition to a market-led economy, carry an exceptionally large burden of under-used and brownfield land. This land represents a “hole” in the urban fabric, with significant losses in economic efficiency, social cohesion and quality of life. At the same time, new development on agricultural land that could have been located on recycled brownfield land is contributing to urban sprawl. This further reduces the city and community economic performance and competitiveness. However many urban brownfields can be put to new and often exiting uses. This is why the brownfields not only represent a threat to their communities but also represent a challenge. Competitively performing cities and regions are at the forefront of the urban agenda of all developed nations and these are the standards that our cities have to maintain to remain competitive.

The shared socialist heritage of Central European cities has shaped a similar set of brownfield patterns and responses (see Fig. 3.17). With no real-estate or capital markets to speak of, state companies did not consider the cost of land or of money when making construction or operating decisions. Raw goods allocation and production was regulated by plans and quotas. Inflexibility and bad predictions about demand and supply led to the setting aside of large areas for the storage of raw materials and finished products often for extended periods. Companies were not responsive to the spatial and financial inefficiencies of these build-ups and their premises were often much larger than their counterparts in capitalist economies and sometimes over-equipped.

³ Jackson, J. and Garb, Y.(2002-2004);, various brownfields papers

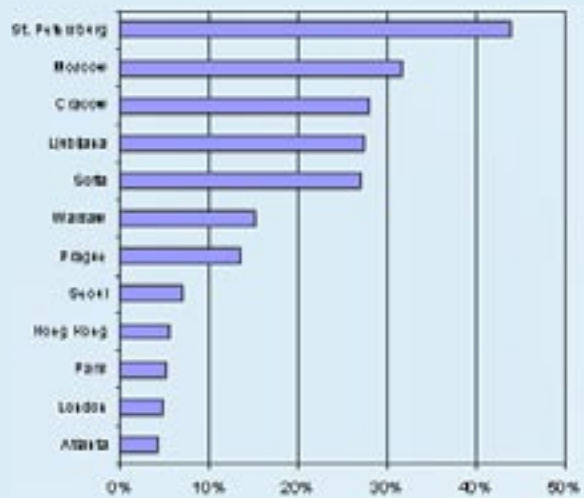


Fig. 3.17 Percentage of urban land devoted to current or past industrial uses - the spatial legacy of these circumstances is apparent in the industrial footprint in post-socialist cities today⁴ :

Thus, central European cities (even those that are not heavily industrialised) have two to three times the amount of space devoted to current or past industrial uses than their western counterparts. The portion of land devoted to industrial uses is even higher in industrial cities, and these face massive brownfield and restructuring problems with the demise of their indigenous industries.

The development of these cities over time under socialist planning added another feature to CEC brownfield location. Massive high-rise housing estates were developed beyond the industrial sites, (often to house workers in these industries), so the expansion of cities made it common for large industrial sites to occupy quite central and valuable land. Because of these housing estates, the graph of declining density as one moves away from city centres is interrupted by a large “hump” in central European cities (see below):

⁴ Kessides (2000)

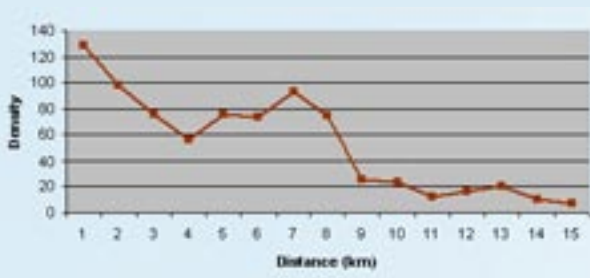


Fig. 3.18 Densities in built up areas as a function of distance from city centre: the density “hump” typical of CEEC cities⁵

It takes competent strategic planning and urban administration to recognise the costs of this disuse and respond to it creatively. It also takes a proactive, creative, cross-organisational effort and funding to “bump” such sites out of their stagnation. Public leadership must provide a range of co-ordinated inputs (policies, instruments, planning, funding and training) to begin to increase the attractiveness of these sites to a point where the market can take hold of them and use the potential inherent in their centrality. But amidst so much change, CEE planners and administrators were not aware until recently of the extent and larger implications of the dereliction of urban land, which had “Swiss cheesed” Central European cities. Nor are the capacities for public intervention up to the task.

The ability of city administrations to tackle brownfield problems was hampered by another legacy of the socialist period, in which land had little market value - land and property are in many instances taxed at a very low rate. The virtual absence of these taxes has several damping effects on brownfield rehabilitation. Owners have little incentive to offer their sites for redevelopment, preferring to simply sit on these assets. At the same time, the city is deprived of an important source of income that could contribute to redevelopment projects. When property taxes are allocated directly to the local authorities they can provide a predictable and thus highly bankable revenue

stream, against which cities can borrow for the purposes of land assembly, infrastructure improvements, and the like. These funds, in conjunction with improved and flexible planning, could make derelict sites more competitive.

With an increasing number of individual brownfield initiatives, there is also a pressing need for networking and for the exchange of experiences and best practices within and between CEE countries that share a similar legacy and predicament regarding their brownfields.



Fig. 3.19 Proximity of housing and a brownfield in Štenberk. Photo D. Sedlák

⁵ Brzeski, J. (2001): „Guidelines for Developing Local Land Management Strategy,” Krakow Real Estate Research Institute

4. Brownfields – the need for policy, strategy and an institutional framework⁶ (author of the chapter Jirina Bergatt Jackson)

Learning outcome – “awareness level”

After reading this chapter you will be aware of the following:

- o What stops brownfield reuse – main barriers.
- o The need for visualising and addressing the brownfield issue – brownfield policy and brownfield strategy.
- o Working formats that progress brownfield solutions – cross-professional, cross-departmental and cross-sectoral co-operation and need for leadership and co-ordination.
- o How to progress the missing brownfield know-how – Educational instruments.
- o Why to lever national and other funding for brownfields – reflecting the issue in the NDP and other programs.

Unlike many urban problems, the question of brownfields is relatively conflict free, in that its solution is not, fundamentally or substantially, to the benefit of some stakeholders at the expense of others. The recycling of urban land is, more than most issues, a win-win solution, with benefits to a range of stakeholders, both in the private and public sectors, at various scales.

Yet still it is an obstinate problem. The difficulties lie elsewhere: in the complexity of the issues and in the linkages and co-ordination required for a solution (linkages across several disciplines and a multitude of stakeholders, for example); in the absence of a clear-cut locus of responsibility and in the diffuseness of the benefits to be gained from an overall solution, whose appreciation requires a fairly sophisticated understanding of urban dynamics.

⁶ Jackson, J. and Garb, Y. ITDP (2003): Facilitating brownfield redevelopment in Central Europe: overview and proposals

4.1 Main national barriers to brownfield reuse

Numerous barriers to brownfield development make brownfield projects more complicated, of longer duration, more costly and more risky. All this deters potential investors who cannot take all the risks that development on brownfield land presents for them. Besides abstract problems (lack of recognition, institutional locus of responsibility and strategy), it is this set of impediments to brownfield reuse and a lack of suitable tools that mainly hampers the market uptake of brownfields in quite pragmatic and concrete ways. Some of these impediments might seem accidental and mundane, yet for a developer pursuing a brownfield site, the devil really is in the detail of administrative rules and procedures. For example, with many large single sites broken into multiple ownership through the privatisation process, complex land assembly is often a prerequisite for a large project; yet the legal instruments for this are quite uncertain. Months or years of work could go down the drain with a single recalcitrant owner. Sometimes as long as 30 years depreciation in terms of the costs of demolition and environmental clearance, make brownfield sites a relatively unattractive investment, compared with other activities or greenfields sites. The local planning system is often inflexible and arcane, requiring much learning and frustration for example, in order to change the zoning status of a former industrial site into a more appropriate commercial or residential use. The levels of cleanup demanded on contaminated sites are sometimes overly uniform and not sufficiently discriminating of the intended end use of the site, whose ordinary ambient state would be far below the levels of cleanup demanded for “rehabilitation.”

However, a more serious impediment to brownfield rehabilitation is the structural disincentive posed by the ready availability of greenfield sites. In essence, by providing a connecting infrastructure (roads, sewage and

electricity) and ignoring the externalities of ex-urban uses, governments at all levels are subsidising the development of greenfield sites and by doing so, are undermining brownfields and their reuse by the very support of ribbon sprawl locations on radial highways. Brownfields are thus losing activities and investments that could be otherwise accommodated on such recycled land. Brownfield sites in most major Central European cities are sufficient to support years, if not decades, of new development, and much of the leakage of office parks and hypermarkets

A final and important kind of barrier to brownfield reuse is the lack of technical tools and professional know-how. Some of these are quite simple: such as a simple method for local authorities to audit and prioritise their brownfield holdings or a nation-wide registry of contaminated sites and their parameters, linked to the cadastral registry, so that buyers can unambiguously know the status of their sites and sellers can record the kind of cleanup or investigation performed. Similarly, a compilation of the unit costs of various kinds of clearance and cleanup procedures would allow a better ability to foresee and benchmark a proposed project and prevent unscrupulous prices for work performed. More sophisticated financial, legal, and administrative tools are required (and are lacking) for example to support public-private partnership arrangements. The main barriers now are not fiscal, but the issues of awareness, co-ordination and inadequate administrative and legal frameworks that prevent the proper channelling of existing resources.

It is inconceivable to think that all the barriers to brownfield reuse can be removed or lowered blanketly for all the brownfield sites or that it is a simple, single issue to remove them. It can be seen, by analysing the output of several projects and from a number of seminars within the region involving broad spectrum

of stakeholders, that a lowering of the actual barriers to brownfields reuse is emerging. But the barriers themselves will remain untackled if:

- private investors will not bite the brownfield reuse bullet.
- lack of integration, leadership and strategy at the state level prevails.
- the municipal leadership is not up to the task.
- an inadequate understanding by communities and NGOs prevails.

A key theme emerging is that in order to remove barriers to brownfield reuse there is a rising need for brownfield leadership at national, regional and local level. This needs to be able to co-ordinate the many measures, policies, and administrative linkages necessary to get more urban brownfield properties “unstuck” and into productive use, and to enable private capital to take a substantial role in this process.

By way of summary the following are some of the key barriers to reusing brownfields:

Know-how, co-ordination, and motivation

Inadequate understanding of the scope of the brownfield problem and of its financial and social implications at all levels.

Low levels of political commitment to brownfield reuse at all levels.

Absence of an overall brownfield strategy mainly at the national level but also in the lower levels.

Inadequate co-operation and knowledge-transfer among disciplines, institutions and departments within institutions.

Inadequate know-how across the full range of potential brownfield stakeholders, including private investors, local authorities, regions, and ministries.

Tools and policies

- Lack of clear-cut policies and strategies.
- Insufficient transparency and enforcement in the legal system in several areas that impinge on brownfield planning, purchase and use.
- Lack of means to insure or cap environmental liabilities.
- Inadequate tools for land assembly.
- Inflexible planning tools.
- Insufficient fiscal instruments and incentives.
- Overly uniform and insufficiently discriminating cleanup standards.
- Lack of a unified registry of sites and their critical parameters.
- Lack of analytic tools and principles for prioritising site investment.
- Lack of benchmarking of the technical and other costs and procedures against international best practices.

Broader market milieu

Even with adequate knowledge, co-ordination, technical tools and policies brownfield rehabilitation on a sufficient scale is unlikely unless the following prevail:

- A vibrant expanding market.
- A local public sector priming finance is in place (for the less prime and heavily damaged sites and to match private sector or EU funding even for relatively well located sites).
- Greater restrictions on the ready availability of greenfield sites. (This availability represents hidden subsidies to greenfields in the form of infrastructure extension, and, in the long term, support for inefficient spatial structures. Thus this item could be rephrased as “removal of greenfield subsidies.”).

4.2 Need for National Brownfield policy



Associated with the absence of a locus of leadership and co-ordination is the absence of a clear national policy statement i.e. what should be done with brownfields and what should be achieved. Without such a policy it would be difficult to galvanize the necessary political will to make the required changes across a whole range of institutions and spheres. This policy need not to be long or complicated. However it needs to express the government weight and intention, implying that it needs to be delivered. It also has to be backed up with a means to deliver and its delivery has to be monitored in order to make sure that it would actually arrive.

Here, as an example, is the British governmental policy, which came in with Tony Blair when he became Prime Minister. His policy simply stated that 60% of new homes would be built on brownfield land⁷. After more than 10 years of it being in place, this policy is not only being delivered, but its targets are being exceeded. It gained substantial public support. It summoned a considerable national effort and the involvement of a broad platform of stakeholders. It has cemented the intentions of various departments and levels of government in meaningful brownfield rehabilitation. It has given rise to new methods of working and to the creation of new tools. It has caused a massive increase in the national awareness of brownfield issues.

⁷ This policy was initially severely criticized as totally unsound.

The southern counties proclaimed that they do not have this an amount of brownfield land and northern counties have so much brownfield land and empty property that market would not take it up. Since then the south has located sufficient brownfields sites and north has more or less banned new housing development on greenfields sites, which helps greatly the desirability and want for local brownfield sites.

4.3 Need for national, regional and local Brownfield Strategies

By whom should the thousands of brownfield sites be assessed? According to what principles should their treatment be prioritized? Where should the funds for this come from? What are the goals and targets that would drive this effort? Who should be responsible for delivering the national policy and co-ordination on a cross-departmental and cross-sectoral basis. Without a clear-cut "owner" of the problem and a clear strategy for tackling it, it would be difficult to force the political sphere to press for action.

Therefore, a strategy is essential. A national strategy should provide a cohesive framework through which the government can address a wide range of issues surrounding the regeneration and redevelopment of brownfield sites. It also should provide a framework that ensures individual regional strategies are developed that are compatible with and complementary to the national strategy. This, in turn, would help meet the medium and long-term property needs of industry, commerce and the public and private sectors in each region.

By involving all relevant stakeholders and making use of all the information, a comprehensive strategy evolves to a better and more focused product reflecting the specific needs of regional stakeholders. In this way it would also be a strategy that is "owned" and fully supported by those regional and local stakeholders. Such a strategy would then be linked to other existing economic development, social and environmental strategies of the region. Quantified objectives needs to be set for the contribution that brownfield sites will eventually make. These objectives have to include specific targets for example the amount of brownfield land to be regenerated, on an annual basis, for different uses (e.g. industry, housing, leisure and recreation, open space, etc.)

Individual Regional Brownfield Regeneration Strategies are likely to include a number of different programmes, each with its own specific objectives and characteristics. Many possibilities exist here and they should reflect the actual brownfield situation of the region and the regional selected priorities.

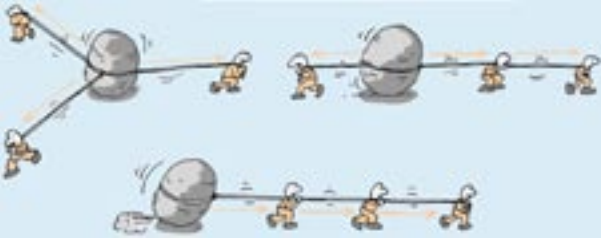
- One programme might be designed to ensure that strategically-located brownfield sites increasingly contribute to the demand for land to be used for industrial and commercial purposes, so contributing to economic development and job creation.
- Another programme might promote mitigation of physical blight in brownfields in non-commercial locations. The program task here will be demolition, decontamination, landscaping and the provision of services.
- The next program might be designed, for example, to enable the reuse of brownfields for specific aims, such as tourism or an increase in leisure facilities.

4.4 Need for inter-sectoral, inter-departmental and inter-professional cooperation

Effective brownfield reuse and revitalisation is a broadly cross-professional, cross-departmental and cross-sectoral affair under quality leadership that is following a strong and widely accepted policy. Without a sufficient level of cross-working and co-ordinated co-operation brownfield reuse will not happen, efforts will be wasted, progress will be sabotaged or withered and monies spent on it will mostly be thrown out of the window.

Brownfield solutions depend not only on a quality horizontal co-operation of all stakeholders at each level, but also on vertical co-operation between the national, regional and local levels of administration, regulative bodies. They also depend on the co-operation and inclusion into this process of private and other stakeholders, who have experiences and actual technical details of specific national/lo-

cal barriers that prevent them from increasing levels of brownfield revitalisation. All these stakeholders need to be active and participate in enabling effective brownfield solutions.



Unfortunately, there is little history of cross-institutional, cross-departmental and cross-disciplinary working and co-operation in the CEC. This makes a comprehensive and effective solution very difficult. Also, regional professional education usually does not sufficiently uphold the cross-professional issues that could help to access, tone and orchestrate the activities of other partners.

The brownfields problem thus continues to “sit on many stools” and often falls “between such stools”. Each of these “stools” represents a different department or a stakeholder’s point of view. Such “stools” usually have fixed and very technical standards covering their individual levels of responsibility, each pertaining only to a small section of brownfield remediation. While they may be pushing for interests that fall under their responsibility they are not able to push for an overall solution. Usually, mainly due to an absence of a suitable coordinating body, they are not able to discern the whole picture. This prevents the synergy of expertise emerging and makes an all-absorbing, effective and creative brownfield solution hard to emerge.

4.4.1 Need for leadership and coordination

This is why to succeed with effective brownfield reuse and to deliver any pro-brownfield strategy or policy, usually a co-ordination body is necessarily placed above the various individual departments /stakeholders interests. However, in order for that to happen, the brownfields issue itself has to be first argued and presented palatably enough to catch the full attention of the national (local/regional) government. This may be difficult to realise, mainly due to the above mentioned fractured and cellular approaches to this issue and for the general lack of sufficient data to describe it sufficiently pointedly and coherently. Only when the results of negative brownfield impact on national, regional and local competitiveness is fully realised by the strategic decision-makers, will a solution be formulated. Such a solution however requires brownfield reuse and revitalization to be made an issue of a national, local and regional government priority. It also requires that direct responsibility for it is attached to a member of such a government (usually a deputy prime minister, deputy-head of a region or deputy mayor) and to put competencies and a little “priming”⁸ finances in place to enable the workings of a coordinating body.

Advocacy, lobbying, motivating, communication, education, preparation of strategic documents and progress chasing to fulfill said targets are then the main tasks of any such an appointed body. For the stakeholders views be represented the appointed body is usually served by an additional advisory committee, on which all the main stakeholders viewpoints are represented.

⁸ Priming finance means in fishing terms a small bait (public finance) to catch a big fish (private finance)

4.5 Need for education instruments

From a number of analyses of the Central European region it is becoming obvious that the largest barrier to brownfield reuse is not, as it is usually assumed, money but the lack of stakeholder know-how, specific explanation and education. This would enable them to act usefully and effectively in order to formulate appropriate policies, strategies and create tools and programs helping them to cope with their brownfield reuse. Such education and knowledge transfer is usually recommended and applied horizontally and vertically through out all the stakeholders bodies, public or private.



Another important fact is that education is usually much cheaper to obtain than any knowledge transfer and that such education usually has a much broader impact. Specific educational packages may actually form a part of certain knowledge to be transferred. Know-how usually has to be bought from local or foreign consultants or obtained through sufficient experience of doing the actual thing. However carrying out the job without sufficient knowledge may be, in terms of mistakes made, more expensive than actually buying the knowledge in the first place.

Part of such a brownfield knowledge transfer is delivered by the project LEPOB through its education packages. The project supplies this handbook, a parallel modular course and a teacher's training package in generic English. Project LEPOB supplies a horizontal holistic education package aimed at the continuous education of chartered engineers.. This package should also serve as an example of how to approach similar educational tasks. The package can be easily adapted for use for other types of stakeholders.

4.6 Need for reflecting the issues in the National Development Program and the new EU-Operational Programs (OP)

As explained elsewhere, brownfield revitalisation is an expensive pass-time and requires a very creative use of "priming" public finance geared by a well-adapted and brownfield reuse-friendly legal framework. Some of this finance can also come from the EU Cohesion and Structural Funding as brownfield rehabilitation fulfils some of its funding priorities. Also, when remediation of these brownfields is well integrated into national structural funding priorities, then their national contribution and future finance are much more secure. This is because to benefit from EU funding for brownfields, matching national funding has to be in place and can not therefore be so easily subject to budget cuts. Structural funding for brownfield rehabilitation is already being used in the Czech Republic. However, as the first experience shows, it is not so easy to use the cohesion funding effectively, mainly due to a long lead in project time preparation and due to the unavailability of substantial projects (especially for brownfield environmental remediation – large state institutions and bodies that could have put large projects together have entirely missed the boat here). In other instances the 'polluter pays' principle sometimes prevents such an application. Therefore using such funding effectively requires long-term, prior planning and preparation along with effective communication to stakeholders of what is being planned in order to secure their timely response.

In smaller programmes the projects are easier to deliver. There exists examples of brownfield conversion for public purposes in the Czech SROP programmes and there is a brownfield reuse title in the OP Industry. Experience shows that the later conceived programs handle the issue of brownfield remediation much better. This may be said of the structural fund-

ing document Objective 2 for Prague, where the issue of brownfield remediation is handled very well with flexibility. However, using structural funding for brownfield rehabilitation requires substantiating one's own brownfield situation (nationally, regionally and locally), as discussed in the previous chapter.

Questions to facilitate further learning that will help you to reach the learning level of "understanding"

- Q1 *Write down the main barriers to brownfield reuse in your country and compare and discuss them with others.*
- Q2 *Is there a national policy/ regional brownfield policy in your country*
- if yes, than discuss with others if it is an appropriate one*
 - if no, write down what you thing such a policy should say.*
- Q3 *Is there a national policy/regional brownfield strategy in your country*
- if there is one discuss with others if it is an appropriate one*
 - if no, write down how its creation should be realised and what should be its main goals*
- Q4 *Write down.. which individual national institutions deal with brownfields in your country and what part of the legal framework representing barriers to brownfield reuse they are responsible for*
- Q5 *Write down which are the regional institutions dealing with aspects of brownfield reuse in your country*
- Q6 *Discuss with others how much communities in your country are aware of brownfield issues*

- Q7 *Write down what tools to help the brownfield reuse communities in your country exist now and what tools would be desirable in the future*
- Q8 *Discuss with others and write down whether the professionals in your country are suitably trained for horizontal co-operation and multigroup solutions working.*
- Q9 *Discuss with others and write down, how brownfield issues are reflected in the NDP and other programs that attract funding.*

BOX 2: Examples of national legislation "visualizing" brownfields in cadastral registers and other solutions

As explained brownfield inventories and analyses help cities and regions to grasp the size and type of their rejuvenation problem. Registers visualising certain aspects of brownfields also may help investors who are searching for information. But one must bear in mind that an individual brownfield may appear simultaneously in several such registers, as all these registers record a specific aspect of brownfields. Registers may also describe the main barriers to brownfield reuse.

Table 5: An example of such registers and their uses

Register type	What it illustrates	In what manner it is recorded	What section of administration it belongs under
Land use plans and planning documents	Define land use and development potential for the land, available in one form or another in most of our communities	Mostly in a format of a drawing, but often accompanied by a written document with legally binding or unbinding parts	Planning departments
Land protection register	These are registers of various aspects of land protection, (for example, NATURA sites, biotopes, national parks, various land reservations, urban conservation areas, etc.	Kept usually in separately drawn documents, and data lists, which may be from time to time used in conjunction with other registers	Sectoral national, /regional institutions or separate regional or local departments, mainly but not exclusively of environmental origin.
Register of brownfield land	Amount and types of brownfield land on national/regional/local level	In data banks and in spatial (GIS) formats	Economic development, strategy and planning departments
Register of vacant land	This illustrates the level of activity of land market	Usually in numbers or volumes of vacant land but can also be expressed specifically (GIS)	Real estate and/or planning
Register of underused land	This illustrates level of the economic underactivity of the land	Difficult to compare, needs to be recorded regularly to indicate trends	Economic development, planning real-estate
Register of land with suspected or proven environmental damage	This illustrates the size of national/regional/local land contamination problem	Broad databases, that can have spatial details (GIS), but can be also contained in land registers	Environmental risks sections or national/regional/local env. Department or env. regulator, or the cadastral office
Register of remediated land	This illustrates what land was remediated, gives remediation standard and history	Broad databases, that can have spatial details (GIS), but can be also contained in the land registers	Environmental risks sections or national/regional/local env. Department or env. regulator, or the cadastral office
Register of actions on remediated land	This illustrates what happened on site for example to reused contaminated materials. It locates them and gives exact details	Detailed written or drawn - best 3D description which can be also contained in land registers	Planning department, environmental regulators, cadastral office
Register of remediated land subject to further monitoring	This illustrates the need for the long term monitoring of certain types of environmental clearance	Detailed written descriptions and drawn diagrams, which can also be contained in cadastre	Planning departments, environmental regulators, cadastral office
Environmental liability register	This illustrates (usually in terms of named perpetrator and secured funding or warranties) the liability for removal of environmental damage	Detail description, contractual warranties, secured payments, insurance and legal agreement, which can also be contained in cadastre	Insurance companies, deeds registers, cadastral registers

Table 5: An example of such registers and their uses

Cadastral land register	This illustrates mainly the title and the impediments on land; it can however illustrate issues from number of above described registers.	Cadastral office	Cadastral offices
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Not all countries make such registers public, nor is their data compiled on national databases. Neither is such data collected and stored in a nationally agreed format. In the Central European area the most common registers are the land and property cadastrals and planning documents. However, in some countries such as the Czech Republic, Poland, Slovakia and the UK property registers are not used to record brownfield-related impediments (environmental damage etc.). Whereas in other countries such as Germany, Flanders and Hungary the visibility in the national property registers (including all potential damage, remediation action and also all the liabilities related to such land) is demanded by law.

Also, not all planning documents yet visualise brownfields (in some of the Central European countries brownfield inventories and monitoring are not yet part of the local or regional plan-making agenda). This applies for most regions of Czech Republic, Slovakia and Poland and Hungary.

BOX 3: The Czech example of assessing brownfield numbers.

This example is given to illustrate firstly what is needed and secondly as inspiration to copy as best practise. In the Czech Republic until September 2004, there was no comprehensive data or even sample data identifying the nature of problem on the national or regional scale. Only a handful of cities had some sort of a brownfield count and brownfield indicators that were pushed by an American NGO - the ITDP. Since then the PHARE financed report "National Brownfield Regeneration Strategy

for the Czech Republic" has disclosed the first comprehensive count of brownfields in a sample region. Figures are given in table 12. The most surprising findings from the data gathered in the second most industrialised region in the Czech Republic were as follows:

- presumption about the nature of the problem in the region can vary substantially from the reality
- 0.46% of land are brownfields
- the analysis of the sites by former use indicated that in the Suit region 43% of all the sites were residential
- only 15% of sites in this region were of an industrial (or quasi-industrial) nature.
- more than 45% of brownfields were small under the size of 1 hectare.
- 27% of sites (and 26% by area) were of agricultural origin
- only 63 (less than 10% in numbers but around 20% in size) sites in the region were of sufficient "bonity" to warrant further investigation by examining their strategic redevelopment potential
- the importance of matching data collection to strategic requirements became obvious

Based on data from this single (but comprehensively surveyed region) an informed prediction for an overall national situation was made.

The report assumes that across the Czech Republic there might be between 8,500 and 11,700 brownfields with a total area of between 270 and 380 km². However, the report assumes that there may be a greater spread within other individual regions and, on the

basis of all best and worst cases, the number of sites might be between 6,500 and 12,500 individual sites with an area between 250 and 400 km² (0.34% to 0.54% of the total land area of the country). See table 11 for this national prediction. For the whole report in English or Czech and the brownfield evidence questionnaire see www.regenerace.org. This report

also illustrates how relatively simply it is to get an overall idea of the actual size of a regional or national brownfield problem. The report emphasises the importance of regional differences and the need for making an actual regional count and analyses, before any priorities can be set.

Table 11: Minimum and maximum figures for some Czech regions⁹

Region	No of Brownfield Sites		Area of Brownfield Sites (km ²)	
	Minimum (No)	Maximum (No)	Minimum (km ²)	Maximum (km ²)
Ústecký	758	758	24.77	24.77
Hl. m. Praha	633	1107	20.61	36.04
Středočeský	1069	1512	34.83	49.24
Jihočeský	436	748	14.19	24.35
Plzeňský	479	754	15.61	24.55
Karlovarský	174	421	5.68	13.72
Liberecký	396	653	12.91	21.26
Královéhradecký	366	752	11.92	24.50
Pardubický	523	663	17.03	21.60
Vysočina	383	633	12.49	20.63
Jihomoravský	575	1320	18.73	42.00

Table 12: Brownfield sites in the Ústí and Labem region, by category, size and total area¹⁰

Category (Type) Size (Hectares)	Number of Brownfield Sites									Total	Total area (ha)
	1a	1b	2a	2b	3a	3b	4a	4b	5		
≤ 1 [ha]	5	317		13		12	1		61	409	204
1–5 [ha]		160		10	1	35		3	46	255	682
5–10 [ha]		40				11	1		3	55	416
10–50 [ha]		13		2	1	13	1		5	35	810
50–100 [ha]		1				2				3	215
100–200 [ha]							1			1	150
200–500 [ha]										0	0
>500 [ha]										0	0
Total Number	5	531	0	25	2	73	4	3	115	758	2477
Total Area [ha]	4	1205	0	115	33	637	175	11	297	2477	

⁹ Parsons Brinckerhoff (2004): Czech Brownfield Regeneration Strategy, CSF, PHARE project EuropeAid/113183/D/SV/CZ, Strategy, table 6.3 and 6.5

¹⁰ Parsons Brinckerhoff (2004), Czech Brownfield Regeneration Strategy, CSF, PHARE project EuropeAid/113183/D/SV/CZ, table 6.3 and 6.5

Table 13: Distribution of Brownfield Sites in Ústí by Size and Former Use

Size [ha] Former Use	Number of Brownfield Sites								Total No of Sites	Total area (ha)
	≤1	1–5	5–10	10–50	50–100	100–200	200–500	>500		
Manufacturing	12	27	9	11	1				60	498
Extractive and Waste Disposal	1	4	1	2	1	1			10	261
Petro, Energy	1	2	1	3					7	87
Military	1	4	2	6	1				14	272
Agriculture	51	120	29	5					205	658
Railway Land	7	5							12	15
Light Industry	9	22	9	2					42	196
Education System	7	5	1	1					14	155
Residential	259	20							279	38
Other	61	46	3	5					115	297
Total Number	409	255	55	35	3	1	0	0	758	2477

What we would gain if our brownfields were reused? – the benefits of brownfield redevelopment.

If brownfield reuse is not addressed, then unfortunately brownfields do not go away on their own – they only become a bigger and more expensive problem over time.

When looking at brownfield land we have to imagine what we are actually losing by not using it. Here is a short example:

- One hectare of land represents 50 potential employment places.
- One hectare of land represents 30-45 housing units.
- One hectare of well-functioning urban land represents an increased tax income for its community
- One hectare of park land represents increased environmental quality, which usually brings a direct monetary benefit to all surrounding properties
- One hectare of forested land represents increased habitats and offers other direct environmental benefits.
- Reshaping and restructuring historical land parcels and uses opens up new possibilities to communities and improves their infrastructure.

Reuse of brownfields therefore results in a win on all fronts and it improves:

- national, regional or local competitiveness
- land use economy in communities (as that they do not carry such a burden of unproductive underused land and infrastructure)
- attractiveness of communities to potential investors
- employment possibilities in communities
- physical and cultural standards in communities
- environmental standards in communities
- wealth in communities
- sustainable growth in communities

What would happen if we do nothing?

If we do not support brownfield reuse, then development will continue to drift on to greenfields. The consequence of this will be that there will be even more brownfield development, due to the fact that the existing urban areas will lack investment activities and will further lose their attractiveness, creating a spiral effect that will further deter their reuse. Such brownfields would not only produce insufficient tax income, but as these areas are usually also blighted by a high unemployment

ment, they would therefore actually consume tax income, instead of creating it¹¹.

This will also cause the entire existing infrastructure on the brownfield land to be under used and often not paid for. A new infrastructure needs be built to serve greenfield sites and this new infrastructure will have to carry the already existing and under-used infrastructure costs.

This all will lower the overall competitiveness not only of the individual community but also of all the services and production in such a district which has to bare such extra costs.

In national terms, the fact that there are brownfields blighted and unattractive areas causes the investors to shy away from them. This perpetuates a high unemployment trend. Unemployment has to be paid for by the taxpayer and by doing so the investment in national infrastructure, education.

5. Brownfield Redevelopment Planning – Territorial Conditions (authors of the chapter Doc. PhDr. Dagmar Petříková, Ph.D., Prof. Ing. arch. Maros Finka, Ph.D.)

Learning outcome – “awareness level”

After reading this chapter you will be aware of the following:

- o The role and importance of planning in brownfield regeneration.
- o The different types of brownfield projects (A-B-C model) and the best practice examples.
- o The importance of planning and management in local redevelopment.
- o The brownfield redevelopment process – an opportunity for an integrated and iterative approach to planning.

5.1 Discovering the development potential of a brownfield site

Urban development covers a wide range of problems. Harmonisation of interests in the field of functional use among different subjects of urban development, fulfilling the functional requirements on spatial quality, is determined by a wide range of subjective and objective factors and goals. Among them the dominant role in almost all urban development strategies is played by the limitation of resources and efficiency of their use.

In this context, the limitation of use of greenfield land and the bringing back into use of formerly used brownfield land belongs to these priorities, especially where this can take advantage of existing urban infrastructure and contribute to the reduction of urban sprawl, to the achievement of urban sustainability and the preservation of the quality of urban life. The responsibility for achieving sustainable, desirable and competitive urban environments is the most important from the multiple responsibilities of the municipalities.

¹¹ In the Czech Republic one unemployed person in national terms 'costs' well over 1000 Euro/months

Urban development is a “play” of many “players”, but the action or inaction of municipalities could reasonably impact the direction of the development, in which the important role is the re-use, under-use or degradation/dereliction of the brownfield and/or activation of greenfields for construction sites. Therefore, there is a strong need for specific strategic approaches to brownfield regeneration as a part of complex urban development strategies. The strategies at the local level are of special importance, but in most cases the range of brownfield regeneration problems oversteps the capacity of municipal level, even of big cities. In addition to this, the decline of urban areas of different sizes seems to be a significant manifestation of the transition process of an industrial society towards a post-industrial society at the end of the 20th and start of the 21st century. Specific approaches to brownfield regeneration at the national and even international level must be an integrated part of the complex spatial development policy at national and regional levels.

A part of the strategy development at all the levels mentioned above is the assessment of the development potentials of brownfield sites. In several cases local decisions are influenced by national policies. Typical examples are the state subsidies for the establishment of industrial or technology parks on greenfields, while at the same time the majority of municipalities have to face the problem of under-used or derelict industrial areas in the state these being already well-connected by the transport systems, technical infrastructure and incorporated into the urban structure. This creates important development potential for available brownfield sites in spite of an often pre-existing environmental burden. The advantages of the localisation of new activities as potential brownfield regenerations have to be assessed, not only from the point of view of the micro-economic effects for the immediate investors, but also in the environmental,

social and economic dimensions of development sustainability at the intersection of local, regional, national and even international levels.

When analysing the development potential of a brownfield site the following aspects have to be taken into account:

- Internal features of the area.
- Detailed functional characteristics (present and past land-use data).
- Features of the built environment.
- Features of the social and socio-cultural environment (cultural assets incl.).
- Features of the natural environment (air and soil pollution incl.).
- Features of the legislative environment (planning regulations incl.).
- Features of the economics of the area.
- Size of the area.
- Ownership conditions.
- Area location in the functional and physical structure of the city.
- Location of the area in the context of transport and infrastructure connections.
- The role of the area in the city organism.
- Existing development strategies, plans and programmes for brownfield regeneration and the relevant stakeholders in the area.
- External conditions for the development.

The base for the analysis of the development potential of a brownfield site and for regeneration strategy development is access to detailed information. For example, a well-functioning land registry is essential for investigating the development of brownfield sites. Environmental agencies are building databases of known and potential contamination, the pollution situation and the important values of the natural environment. Special systems of information on the living environment integrating the whole range of relevant information available are to be created in many countries, based on the interaction with GIS data (existing as land-use categories, urban planning regulations and planning decisions)

Aside from the gathering of relevant data on brownfields the proper interpretation of these data concerning the potential of brownfield, is equally crucial.

Example of Ostrava, Czech Republic – systematic approach to the brownfield inventory

Ostrava started to create a brownfield inventory at the city level in 1999. The inventory consists of a digital map and text descriptions. There are about 100 sites in the inventory. The inventory includes all sites that were impacted by industry (including mine dumps, sludge pits and others). Properties in the inventory comprise about 15% of the city's built-up area. The inventory also contains information which could be helpful for potential investors/developers. One purpose of the inventory is to allow the city to select the most appropriate sites and to prepare special offers for investors. Former uses of these sites were primarily steel production, the chemical industry and the mining industry. Environmental contamination has affected the soil and groundwater and there are all levels of contamination (low, medium, high/emergency status) depending on the former type of activity. There are many sites near the city centre because of the history development of the city. The city of Ostrava provides financial support for the projects of redevelopment from the city budget and these financial means have been used for surveys, development plans, purchase of land, technical infrastructure etc.

5.2 Reflecting the issue of vacant or under-used land in planning documents

Although brownfield regeneration strategies, as shown above, have to be integrated parts of development policies they are primarily linked with urban planning and development strategies under the responsibility of local governments. National policies focus on the identification of brownfields and on the need for external intervention to regenerate them, but any brownfield regeneration strategy needs a local component to examine the wider impacts of intervention with regard to the surroundings.

As planning sovereignty forms a part of the territorial sovereignty respected in European democracies, local governments play a key role in brownfield regeneration management as an integrated part of spatial development management at a local level, including the planning processes. In the planning process the regulations concerning land-use of the sites in the municipality with regard to functional and physical structure, development strategies, limits, schemes and patterns are set. In this way the planning document is very important, but not the only instrument of the active brownfield regeneration policy. There is a strong need for a holistic approach regarding regeneration policies integrating the environmental, social and economic dimensions and the reintegration of brownfield sites into the urban functional structure.

Municipalities can play an active role in promoting brownfield regeneration by providing a complex policy framework integrating the sectoral policies (fiscal subsidies, allowances, taxes, environmental limits, fees, directions, orders, social benefits, public services and resources, raw materials, financial, infrastructure and human capacities). The co-ordination of sectoral policies, allocation of resources and the exploitation of these resources in time and space is a crucial role in spatial development planning and especially land-use planning.

In the context of understanding the limited possibilities for safeguarding the sustainability of development, the role of space/land as one of the limited resources has increased. The greenfields outside the built-up area of a municipality and even well inside the urban structure are no longer unambiguously interpreted as vacant or under-used land. They now play an important role in the ecological and psychological quality of urban environment and urban life. Sustainable development strategies via orientation toward the intensification of the exploitation of plots inside the built-up areas of municipalities and chase the goal of preventing urban sprawl. Each functional area within the city, with its physical structures (buildings, technical and social infrastructure, etc.), is subject to the development processes representing its life cycle. The dynamics of these processes depend on the dynamics of the innovation cycles of society as a whole especially in certain functional segments.

Innovation cycles in the production sectors, having become shorter, accelerate the dynamics of the life-cycle of urban functional and physical structures. The flexible urban structures are, under certain conditions, able to adapt themselves to new requirements in a natural evolutionary process. However, in many cases a phase of decline follows the phases of dynamic development and stabilisation due to inertia, inflexibility of the physical structure or unfavourable external conditions behind the natural development of the city or region as a whole. Therefore it is not able to start the new development using its internal potential. It is very important to identify the first symptoms of such development (under-used areas, environmental or social degradation etc.) by the permanent monitoring of the spatial development as an integral part of the planning and management activities at a local level. This allows reaction by appropriate supportive measures to be carried out much more efficiently than by comparison with the

necessity to start the complex regeneration process on the existing brownfield.

In certain cases the lower development dynamics can be determined by specific societal interests in certain areas, motivated by specific values of function or the physical structure of the area. This interest can be expressed by the protection of cultural heritage or environmental protection, thus setting the limitations for extensive development. Those areas need a special planning approach, identifying such areas and their specific values and implementing a specific regime for them. Thus requiring and allowing the activation of development potential based on a sustainable valuation of specific values of the area, often under sustainable external support.

In general, there is still a lot of confusion and lack of awareness regarding what brownfield regeneration really means and why greenfield developments are, in the long term, in contradiction not only with the environmental but also with the economic dimension of sustainability. This weak point can be overcome only by systematic planning initiatives.

5.3 Reflecting the environmental risks attached to already used land in planning documents

The synergy of population growth, further urbanisation and the transition of industrial-based economies towards knowledge-based economies is placing a tremendous strain on resources and the environment. Cities themselves rely on the balance of inputs in terms of physical resources (raw materials, energy, construction materials and space) and the ability to dispose of the outputs, in terms of waste products, to their hinterland.

The need to respond to current demands without compromising those of future generations is driving forward the reflection of environmental risks attached to current land use. Adoption of new technologies in building, transport, water management and en-

ergy recycling has become a major concern of the sustainable re/development of cities. Post-modern value systems and quality of life expectations show increasing intolerance of environmental risk attached to existing land use or to planned development. Terms such as brownfield revitalisation, landscape revitalisation and urban structure revitalisation become an integral part of development strategies. Although the process of rehabilitation can refer to different aspects of spatial quality, the environmental dimension of rehabilitation dominates.

Reflection on the environmental risks attached to already-used land in planning documents requires the following steps:

Analysis – selection, specification and characterisation of abiotic and biotic complexes in the context of the socio-economic situation. The output of this step is a series of analytical maps showing the ecological conditions of the territory - geology, hydrology, climate, soil, biodiversity, positive and negative features of relevant complexes etc...

Interpretation – the creation of so called “focused characteristics” (e.g. *sensitivity, ecological importance, carrying capacity*, etc..) that represent the baseline for the evaluation of environmental problems as well as for elimination proposals.

Evaluation – focused on the assessment of the present land use based on the ecological (primarily landscape ecology) limits coming from the interpreted focused characteristics of the land. The main result of this step is the evaluation of the present land use, its adverse impact from the point of view of ecology and the determination of ecological problem areas, i.e. areas in which the present land use does not correspond with the ecological (primarily landscape ecology) principles.

Proposition – the generation of a series of measures for solving the environmental problems of given land and the consequent opti-

misation of spatial and functional land use. Propositions can be divided into the following categories:

- propositions for the minimisation/elimination of environmental risk associated with measures that focus on the removal of environmental stresses (e.g. decontamination of soil, implementation of new air cleaning technologies to minimise air pollution) without limitations for current/planned land use.
- propositions for the minimisation/elimination of environmental risks influencing current/planned land use accompanied by:
- propositions for the increase of ecological stability and biodiversity.
- propositions for environmental protection and conservation.
- propositions for natural resources protection.

5.4 Importance of a local development and planning initiative

Successful regeneration of brownfields is a complex endeavour, requiring the joint effort of many different stakeholders. Although the local level is crucial for achieving the co-ordinated approach, it is also vital to co-operate with state governmental bodies, regional bodies and neighbouring municipalities. If one of the municipalities in the region sets stringent regulations against greenfield developments, but the neighbouring municipalities allow the development on their greenfield sites, it will be really difficult to get developers to use brownfield sites. Regional co-operation and a proactive state policy supporting brownfield regeneration in the combination with the planning initiatives at the local level seem to be preconditions for safeguarding sustainable urban development, including the regeneration of brownfields.

Potential projects often fail at an early stage because of the absence of clear strategies based on joint stakeholders' development

visions and goals, insufficient co-ordination within the stakeholder group, absence of mutual trust and often insufficient co-ordination within the local government itself (departments do not communicate with each other, their co-operation limited by mutual rivalry). These problems are often multiplied by lack of experience and knowledge at local level. However, an understanding of the depth of brownfield problems is essential for a successful brownfield regeneration scheme development. Therefore, a realistic estimation of the local capabilities for strategy development, planning, programming and managing the regeneration process is a very important part of the start-up phase of any brownfield regeneration process.

Example of Bratislava Rača, Slovak Republic – creative local visioning and the involvement of stakeholders

The strategic vision encompasses the development of local communities and urban areas into attractive places for living and the development of services and facilities. This includes connecting to natural sites and developing manufacturing, trade and commercial facilities on the periphery.

The city quarter of Bratislava-Rača has large brownfield areas in its south-eastern part. The city has formulated its own vision and development strategy at the local level in close co-operation with local stakeholders and with broad public participation. At the same time the strategy has been produced by co-ordinating with the development plan of neighbouring city quarters and with the vision of the capital city as a whole in the preparation process of the Master Plan and the Development Strategy of Bratislava, the capital of the Slovak Republic. This allowed the integration of local and external sources, with the active support of the local community, working together towards the implementation of a comprehensive regeneration strategy.

In most countries, the planning process is long and complicated. Drawing up a local plan takes a long time and the process of its negotiation and ratification by local government is a lengthy one. For most brownfields it would be helpful if the planning activities, including the investigation and interpretation of different studies, could be brought together within an efficient planning process preferably under the leadership of a planning and decision-making body with the appropriate authority and trust among the stakeholders. Such bodies used to be the local planning authorities, but the planning initiative of other stakeholders can be used efficiently.

5.5 The planning and management context of brownfield redevelopment. Brownfields, local land management and municipal planning

The redevelopment of brownfields is a complex process. Principal changes in the physical environment, urban fabric and natural ecosystems accompanied by the revitalisation of local economies and social systems are integrated into the synergy of new sustainable development. In addition, this integrative, complex process requires the joint effort of different stakeholders with different interests, capacities and abilities.

Practice with the brownfield redevelopment process shows that safeguarding sustainable development in former brownfields not only means investment in the elimination of the environmental loads or the rehabilitation of local economy on the brownfield area itself, but also depends on its long term complex integration into the organism of the city. In this context, there is no opportunity to solve the problems of brownfield redevelopment by isolated rehabilitation actions/activities in an appropriate way. Only a strategic goal-oriented approach, as an integrated part of local land-use management framed by systematic development planning, can guarantee efficient redevelopment investment.

Example of Essen, Germany – diversity of activities and image development

The use of the brownfield area Zollverein in Katernberg as an innovative business location and cultural centre is a part of a sustained integrated development concept. The Design Platform as a professional education and research institute, the Metaform as an international design exhibition, the Zollverein Design Park as an industrial area and the relocation of the Ruhr Museum as an exhibition site for industrial culture, natural history and cultural history will be further building blocks of the development. 10,000 sqm of the Zollverein site are to become home to companies from the fields of design, architecture, exhibition construction, advertising, marketing and communication. Design competence will be concentrated here and make an important contribution to the economic situation and the job market. The prestigious environment of a World Heritage Centre will guarantee a high profile. At the same time, the continuation of the Zollverein concept will be secured. The "Creative Village" is being constructed on the site of the former materials store of one of the Zollverein mines. Here there will be space for start-ups and young companies, students and graduates of the Zollverein School of Management and Design will be able to make professional contacts or found a company themselves. The Industrial Design Park is a market for new opportunities: for companies, for the economy and for Zollverein.

5.6 Flow-Chart: Overview of the brownfield redevelopment process showing the necessity for an integrated and iterative approach

A relatively broad interpretation of the term 'brownfield' follows from the broad scale of brownfield types and determines the vari-

ety of problems and combinations that the process of brownfield redevelopment has to face. In addition, the choice of an appropriate approach, method and instruments for brownfield regeneration depends not only on the specific problem but also on the specific framework of the regeneration process determined by political, institutional, financial, and other conditions. In spite of this, the logic of urban development processes where the brownfield redevelopment belongs, allows us to define the framework of this process in the form of a flow chart of the main steps/phases with specific tasks, approaches, methods and instruments making up the parts of an integrative system. There have been several attempts to define this system, its steps and possible approaches. Some of them very average, some with the strong features of a neoliberal approach to urban development. In addition, the definition of such system does not mean that every brownfield redevelopment process has to follow the complete structure of these phases and steps in the same way (neither does it do so in real practice). Some of the phases from the model flow-diagram can be integrated into practice, some of them can be dominant depending on the brownfield specificity or framework specificity.

The flow-diagram as the basis of the 'Collaborative Strategic Goal-Oriented Re-Development Approach' proposed in this chapter develops the idea of a collaborative strategic goal-oriented programming (CoSGOP) approach using the background of the Central European planning culture and brownfield redevelopment practice.

The benchmarking relates to the first two stages of the proposed approach and involves using retrospective methods that help benchmark the current situation or status quo of certain brownfields. In particular these help to:

- define the outer boundaries of certain brownfields and their functional position within the city and the city-region based on or considering a scientific approach;
- analyse the situation and identify the key

problems of brownfields (e.g. pollution, fragmented land-use, weak economic competitiveness, negative demographic trends, housing vacancies, cultural segregation and social exclusion).

Table 6: Main Steps of the brownfield redevelopment process

Main Steps		Stages
Benchmarking (retrospective methods)		1. Analysis of problems and potentials* - diagnosis (including SWOT analysis, core problems regarding environmental, economic and social aspects)
		2. Stakeholder analysis and formation of a framework for co-operation
Visioning (prospective methods)		3. Analysis of goals and alternatives (including elaboration of scenarios),
Predicting (prospective methods)	Planning	4. Plan development and interest mediation, (including mediation of joint objectives, definition of priorities, strategy development),
	Programming/plan operation	5. Programme formulation and negotiation (definition of activities, measures, assumptions, indicators, inputs),
Implementing (project management methods)		6. Implementation of proposed measures, realisation of programmed activities, co-ordination of activities and methods between stakeholders in real time and space
Monitoring and adjustment (retrospective methods)		7. Programme implementation monitoring (investigation and assessment of the implementation process and feed-back including strategic impact assessment, ex-ante evaluation).
		8. Permanent development monitoring (sustainability development assessment)
		9. Adjustment of the strategies in accordance with the monitoring results

(* Potentials' are part of 'visioning' as these rely on using prospective techniques)

The site analysis, as a basis for the active use of its results in the visioning and predicting phases, represents one of the key conditions for an efficient redevelopment process. The complexity of the brownfield redevelopment process requires broad investigation and assessment activities focused on the identification of the problems, potential of the brownfield area itself and on identification of the external potential and conditions for the brownfield regeneration process. Criteria for site analysis consists of four main groups: economic criteria, ecological criteria, social criteria and urban fabric criteria:

Table 7: Economic criteria

Local commercial activity
Local economic dynamics
Dependency on outside investment
Investment (private and public sector)
Fluctuation of enterprises (in/out migration)
Demand for retail goods and services
Supply of retail goods and services
Land values / rental values
Enterprise start-ups
Vacant industrial, commercial and office space
Range of local employment opportunities
Level of unemployment
Spatial mismatch between people and jobs

Table 8: Ecological criteria

Emissions from local industry / households / traffic
Pollution of air
Pollution of water
Pollution of Soil
Hazardous waste / contamination
Level of Noise
Decrease of biodiversity
Deficit of open space
Deficit of green space
Public access to green areas
Danger of natural disasters (e.g. flooding)

Table 9: Social criteria

Population change
Ageing population (more older people)
Mortality
Immigrants, ethnic and minority groups as percentage of total population
Level of social segregation
Level of income
Level of poverty
Level of social transfers
Health conditions
Deficit in education
Level of criminality
Level of civic involvement
Level of civic commitment
Costs of housing relative to revenue
Population density compared to built-up area
Occupancy of flats / rooms

Table 10: Urban fabric criteria

"Barrier" in cityscape
Image / Perception from outside
Image / Perception from inside
Townscape / urban structure
Residential quality
Vacancy in living + office space
Conditions of buildings e.g.
- Scope for renovation
- Sanitary installations
- Size of flats
Ownership of land/buildings, e.g.

Table 10: Urban fabric criteria

- Heterogeneous ownership
- Public ownership
- Absence of landlords
Quantity and quality of social-cultural infrastructure
Quantity and quality of technical infrastructure

The *visioning* phase, which takes on the 'potentials' aspect of the brownfield features, helps to develop scenarios and possible strategic concepts for the re-development process on respective brownfields in accordance with specific problems identified in the previous phase. This step connects prospective methods such as scenario development, visioning workshops, foresight, etc.

The *predicting* phase includes two stages – planning and programming, which also rely on using prospective techniques.

The *stage of planning* confronts the alternatives and scenarios developed in visioning with the possibility of achieving the defined goals by implementing a certain development strategy. Therefore, the interplay between the visioning phase and the planning stage of the prediction phase is needed in order to reach more accurate decisions on future scenarios and responsible strategies. This is based on the assumption that visioning relies on the use of qualitative, subjective techniques and that prediction relies more on quantitative, scientific techniques, such as modelling. An important feature of this phase is the involvement of current and potential stakeholders in the predicting process. It is very important to attain the objectives and hierarchy of priorities of the stakeholders via their interests' mediation as the crucial step in the strategy development. Only joint objectives and priorities safeguard the successful redevelopment process since they are the inevitable condition under which to get the support for the implemented strategy from the relevant stakeholders.

The *stage of programming* as the part of the *predicting* phase can be understood as the stage of operationalising the integrative strategy and partial strategies by proposing a system of inter-related activities and measures co-ordinated in time and space. An important part of the programming stage is the detailed definition of necessary inputs and resources and indicators of expected outputs.

The *implementing* phase represents the realisation of the proposed measures and programmed activities, co-ordination of these activities and measures between stakeholders in real time and space in accordance with the developed plans and programmes implementation.

This phase is followed by *monitoring*, similar to the *predicting* phase with several stages. The stage of *programme implementation monitoring* represents the investigation and assessment of the implementation process, feedback including strategic impact assessments and ex-ante evaluations, whereby retrospective methods will determine whether the rehabilitation scheme has been successful or not. It will, depending on the outcome, help identify bottlenecks, pitfalls, solutions and best practice. This is very important for the self-learning process at all the levels from local to international.

The stage of *permanent development monitoring* covers the long-term investigation of the urban development processes focused on sustainability features in the development assessment.

The stage of *adjustment* contains the adaptation or revision of the implementation activities or even the development strategies based on the outputs from the monitoring of the programme implementation progress and on the development of framework conditions for programme implementation.

The flow diagram contains the following detailed structure of activities:

1. Benchmarking

1.1. Analysis of problems and potentials - diagnosis

- 1.1.1. Identification of forces for change
- 1.1.2. Identification of core issues
- 1.1.3. Collection of information
- 1.1.4. Resource assessment
- 1.1.5. Limitation assessment

1.2. Analysis of stakeholders

- 1.2.1. Identification of stakeholders
- 1.2.2. Identification of stakeholders interests
- 1.2.3. Identification of stakeholders capacity
- 1.2.4. Identification of stakeholders collaboration capacity

2. Visioning

2.1. Analysis of goals and alternatives

- 2.1.1. Identification of expected outcomes
- 2.1.2. Identification of objectives and targets

2.2. Generation of visions – alternatives and scenarios

3. Predicting

3.1. Planning

- 3.1.1. Interests' mediation among stakeholders
- 3.1.2. Definition of common objectives
- 3.1.3. Definition of common priorities
- 3.1.4. Generation of alternative strategies
- 3.1.5. Assessment of alternatives
- 3.1.6. Plan development

3.2. Programming

- 3.2.1. Definition of plan implementation activities and alternatives
- 3.2.2. Identification of necessary inputs for certain activities
- 3.2.3. Identification of available resources for necessary inputs
- 3.2.4. Identification relevant stakeholders for certain activities
- 3.2.5. Negotiation among stakeholders
- 3.2.6. Definition of priorities
- 3.2.7. Definition of pilot projects

3.2.8. Design of action plan - development of the programme operation of the plan and chosen activities in a defined system relationship (activities co-ordinated in time, space and content)

3.2.9. Definition of progress indicators

4. Implementing – project management

4.1. *Realisation of the action plan – implementation of proposed measures, realisation of programmed activities, co-ordination of activities and measures between stakeholders in real time and space*

4.2. *Comprehensive land-use management*

5. Monitoring

5.1. *Programme implementation monitoring*

5.1.1. Ex-ante evaluation/strategic impact assessment

5.1.2. Investigation of the implementation process

5.1.3. Assessment of the implementation process

5.2. *Permanent development monitoring*

5.2.1. Investigation of the development processes

5.2.2. Assessment of the development sustainability

- What factors do these criteria contain?
- What is the structure of activities to be carried out for the planned redevelopment process?

Questions to facilitate further learning that will help you to reach the learning level of “understanding”

- What aspects are taken into account when analysing the development potentials of a brownfield site?
- How can we reflect the environmental risks attached to already-used land in planning documents?
- What are the main framework steps in planning related to brownfield redevelopment?
- What are the main criteria for site analysis?

6. Technical and environmental aspects (authors of the chapter Rafal Krzywon, Lukasz Drobiec, Marcin Gorski)

In general brownfield reuse is more complex to deal with in terms of development than development on greenfield locations. There are many additional factors that require investigation, there needs to be additional consultants involved and there are many more development risks attached to this process. In the case of substantial demolition and environmental clearance work, there may be a gap of several years before a viable site for redevelopment is available. Common practice by sellers is to remove structures to ground level, this can often lead to the developer's perception that all will be plain-sailing, that is until such time that his engineers start the site investigation.

- risk management and risk communication
- soil management
- project management and sub-contracting
- Initial due diligence chart
- Intermediate due diligence chart

6.1 Site Investigation and Surveying

Site investigation is a complex subject on which a team of various consultants usually co-operate lead by a development manager. Sites are also being investigated for many purposes from purchase and development facilitation to regulators taking action. The investigation of brownfield sites is more complex as it needs not only to establish the existing structures and uses but also to concentrate on the sites past uses and processes. Generally, brownfield sites with less "site build up ratio" are easier to survey and to reuse than sites which are heavily built upon. Sites that were subject to bankruptcy proceedings also have specific difficulties

- On approaching any site and especially brownfield site investigation, it is important to know what level of investigation is being commissioned and why it is being done. One must remember that surveying the site can be carried out for various purposes and that various level of detail will be required at various stages of site investigation. The table 14 explains various types and levels of investigation.

6.2 Preliminary site investigation checklist

In the short term the goal is to collect the maximum amount of relevant information. The most significant advantage of such a procedure is the high-end value of information obtainable for minimal financial investment.

Preliminary site investigation aims to assess the site and estimate if, and eventually how, the site is contaminated. Unless there are any boreholes recorded, environmental audits (compulsory for certain industries) or any documents assessing the site available to hand we have to make do with the preliminary investigation. Information about production, processes and substances used shows if there were any possible sources of contamination, which combined with the knowledge about the site use and data from maps, surveys, discussions, geo-environmental maps, geological archives, the local department of environmental affairs and other available sources, should be sufficient for an assessment. This should be in terms of, contamination (sure, probable, unlikely) and hazard (acute, medium, safe), migration of contaminants (far reaching, blocked by natural barriers) and also in terms of the potential future use (residential, commercial, recreational, industrial), threads (known, expected), interested parties, financing (private, PPP, public only) and next steps towards the redevelopment.

Relevant information for preliminary investigation can be divided into following groups:

- General maps
 - » Town plan, local map,
 - » General city plan,
 - » Plan of distribution networks and grids,
 - » Cross-interests scheme (concurrence of interests),
 - » Land-use limits scheme,
 - » GIS resources, Ortofoto maps,
 - » Cadastral map,
 - » Flood plans.
 - Specific maps:
 - » Set of geo-environmental maps:
 - ~ Geological map,
 - ~ Engineering geology map,
 - ~ Hydro-geological map,
 - ~ Map of natural resources,
 - ~ Map of geochemical reactivity of rocks,
 - ~ Soil interpretation map,
 - ~ Soil map,
 - ~ Map of geochemical composition of surface waters,
 - ~ Map of geophysical indicators and interpretation,
 - ~ Map of geo-factors – concurrence of interests,
 - ~ Map of geo-factors – prominent landscape phenomenon
 - ~ Map of protected areas
 - » Map of rainfall (rainfall – runoff relationships)
 - » Culmination flow rates of nearby streams
 - » Nearby boreholes and their interpretation
 - » Environmental audits
 - General information
 - » Details about the construction of the object
 - » Project
 - » Foundation bearing capacity
 - » Disposition, dimensions, spans – gaps
 - » Materials used
 - » Building services, distribution networks
 - Use record
 - » Way of use, processes, modes of productions, technologies used
 - » Volumes, frequencies
 - » Used substances
 - » Changes in use, end of use (dates)
 - » Cultural and historical technical heritage
 - » Accidents, emergencies, sudden deaths, fires, leaks.
 - Information in archives and historical documents
 - » Annals, commentaries
 - » Old city plans
 - » Prior use of the locality
 - » Assessment, any related projects (reconstruction, conversion)
 - Information from the site
 - » Walk over
 - » Site visit – assessment of the situation
 - » State of vegetation, animals, colours, smells
 - » Every photograph available
 - » Conversation with (former) employees, employers, neighbours, witnesses
 - » Quality of water in nearby wells
 - Comparison of legislation
 - » Changes in allowed concentrations
- Unfortunately all necessary data cannot be found under one roof. Queries to different offices and departments are necessary, some sources are by order only. Therefore, it is highly recommended to work with more than one site at the same time.

6.3 Site investigation

Table 14: Site investigation

	what for	for whom	who is involved in the preparation	what is the product	how much
Desk top investigation (information is obtained from available public sources- internet, press, sellers or agents brochures, public records)	Initial perception Orientation information for facilitating further investigation	client to consider purchase developer to consider the development consultants to advise clients first brief for sellers to understand the site	individual who needs to know individual who is commission to find out	1-3 page outline statements	free service or next to nothing
Outline investigation (can cover various aspect such as ownership, land-use, value of site, cost and potential value of possible development)	to establish main fact about the site to identify the main risks	client to assist with the purchase decision developer to assist with the initial development proposal consultants to advise on first development proposals regulating authorities to formulate their initial opinion on reuse of the site for sellers to understand the risks related to the site	specialist project management or surveying practitioner, who may invite other parties	10-20 page report	Max. 3000 EURO
Detailed investigation (there may be several types of investigation going on proving various facts and risks identified in the outline investigation)	to confirm record and analyse the main facts	client to confirm the purchase decision developer to formulate the outline development proposal consultants to produce specific advice on issues identified regulating authorities to formulate their requirements	specialist consultant or lawyers	reports of various type, in accordance with commissioning documents	cost money Based on private agreement, but may be regulated by the professional levels of fees.

Table 14: Site investigation

<p>Specialised investigation for example</p> <p>Legal title, ownership and indebtedness</p> <p>Environmental pollution</p> <p>Environmental assets and barriers</p> <p>Demolition and dilapidation schedules</p> <p>Infrastructure availability, condition and ownership</p> <p>Ground and foundation condition</p> <p>Structural reports of existing structures</p> <p>Financial feasibility</p> <p>Outline development proposal</p> <p>Real estate valuation</p> <p>Risk analysis</p>		<p>client to elaborate the purchase decision</p> <p>developer to elaborate the outline development proposal</p> <p>consultants to produce specific detailed advice on identified issues</p> <p>regulating authorities to elaborate their requirements</p>	<p>specialist consultant or lawyers</p>	<p>reports of various type, in accordance with commissioning documents</p>	<p>cost money</p> <p>Based on private agreement, but may be regulated by the professional levels of fees.</p>
<p>Due Diligence – an in-depth analysis reviewing and evaluating all the available information</p> <p>On complex projects can be carried out at the intermediate level and at detail level</p>	<p>to confirm or denounce the investment decision</p>	<p>client to accept or refuse the purchase decision</p> <p>developer to accept or refuse development proposal</p>	<p>specialist team lead by a senior project manager consultant or by client procurement director</p>	<p>purchase/development decision</p> <p>can request a report stating the main grounds for the decision formulation</p>	<p>Can cost a lot of money</p> <p>Involves a number of professionals</p> <p>Based on private agreement, but may be regulated by the professional levels of fees.</p>

6.4 Ownership issues

An unrealistic expectation of brownfield owners was identified as the biggest barrier to brownfield reuse by the UK brownfield professionals (survey by Y Syms, Releasing Brownfields, Centre of Built environment in Sheffield Hallam University, 2001). These unrealistic expectations arise mainly from their lack of understanding the additional costs attached to brownfield development.

However, ownership touches onto brownfield issues in several other aspects. These are:

- Owners ability and willingness to act
- Risk attached to brownfield property ownership titles and rights that relate to land
- Risks attached to lender's charges on brownfield land and property
- Risk attached to rights on land invisible in public registers (leases, depreciation tax issues etc.)

Not all the owners are "good" or competent owners, and brownfield owners are usually those who were left out by market changes. Also, not all the brownfield owners want to act on their brownfield ownership. Some owners are simply unable to act because of age or infirmity, or they are living abroad. Other owners can not be located or are unknown. There are also those who are known, but have no intention to act. This may be for various reasons. They have no money to act, they have brought the property for speculation and the time to act is not judged by them yet ripe, or they have, in general, large property holdings, but the property is not their core business and nobody is pressurising them up for the effective use of their assets (this is typical for state-owned utilities, railways and the like)

- The situation whereby the land-owner himself is the most interested party in the brownfield reclamation is the most favourable one for the success in such a process.
- In other instances, it may be the local government, taking the initiative in a formal

way though its planning powers or more informally by advising and facilitating owners or mediating the site assembly.

- Initiative to assist owners can be also lead by a regional or national agency.

The number of owners having an interest in any brownfield site is one of the most telling indicators of likely chances for reuse.

- Single ownership is usually the most favourable situation.
- Usually with an increased number of owners the chance for successful reclamation decreases.
- Shared development objectives are very difficult to realise in the case of a vast ownership structure.

Experience in Krakow city concerning the construction of the Techniczny Park Kraków Wschód (Technical Park Krakow East) can serve as an example here. The past communist regime Land Assembly powers in 1980's were next to absolute, but for some reason, an acquisition of some plots in the Sendzimir Steel mill protection zone were not completed. Twenty years later, when the ownership rights became again much more stringent, this resulted in variety of plot ownership forms in the area of planned investment (Fig. 6.1). Problems encountered delayed investment by 6 years. It was necessary to take additional action consisting of imposing long-term acquisition management strategies.

The other aspect to consider is the title to the ownership. A large amount of property and interests in such property are visible and registered in the cadastral registers. These registers are, for better or worse, used to record and trace the history of the property titles. However, in each country, there are usually cadastral quirks which make some of the titles not safe. Also, some categories of property are visible in the cadastral registers (underground structures for example are not normally visible in the Czech cadastre). Brownfield land usually

has more complexities of various types attached to its title. Apart from the ownership issues, there may also be other interests in land, such as various charges (for mortgage and loan guarantees), various rights (for example the right to support past infrastructure under or over the land) or various rights related to the access to the land. Therefore, property which has a long use history usually has a larger risk attached to its title and the limitation arising from such a title as well as the title itself needs serious consideration.



Fig. 6.1 Division of the area into plots at the site of the Technical Park Kraków-Wschód construction

Indebtedure and bankruptcy

The physical degradation of brownfield sites is often accompanied by a degradation of their ownership status and integrity. One of the processes that usually degrade brownfield ownership is indebtedure and bankruptcy. Indebeture precedes bankruptcy. Unrealistic amounts are often secured on the brownfield property, which has by its nature a tendency to decline in value. When the business income is unable to pay for debt servicing then the bankruptcy administrator steps in. Initially, as there is little cash in such a company, he tends to finance his proceedings by disposal of properties in small individual lots. The residual property after such disposal often carries an unusually large amount of ownership restric-

tion and limitations with high liability and indebteture risks attached to it and the new buyer is accepting these risks usually without much redress. This makes it a less viable purchase and unattractive for redevelopment.

BOX 4: Losing site integrity

The process of privatization, and in particular some of its irregularities, has had the unanticipated effect of impairing the treatment of brownfield rehabilitation. This describes the loss of property and the spatial and financial integration that took place during the period of the Czech privatization. The process was know also as tunneling and consisted of the privatized companies asset stripping. Devious property transfers were a key element. The goal of this tunneling was to move as many company assets as possible into protected ownership at vastly under-priced rates. The remaining husk of privatized companies often failed and ended up in bankruptcy receivership — since the intention of purchase was often simply this asset stripping.

The companies to which assets were transferred were often related to the seller, but formally insulated from it by the ineffectiveness of the law and its enforcement. The properties might then be resold, to provide still further protection against their recovery. For a period, such transfers had the added advantage of practically removing the possibility of reclaiming the mortgage they bore—as collateral for the loan for privatization purchase in the first place!

A natural legacy of the privatization process was therefore that a large number of properties ended up in receivership after the bankruptcy of such mismanaged privatized or restituted companies. Receivers had little interest in knowing or making known any specific encumbrances, (environmental pollution for example) since these compromised their mandate of achieving a rapid sale and as high

a price as possible. This favored sales to risk-ignorant buyers.

The privatization process and then the sale of properties in receivership also led to a widespread fragmentation of sites to a degree that rendered many unwieldy for redevelopment projects. Splitting properties increased income, and attracted speculative buyers purchasing slivers of sites specifically for their future nuisance value. Over time, some large sites have passed from a single ownership to a handful of owners, and then to dozens. In some cases, even the land and building ownership are split, as land and the buildings are separately registerable entities in the Property Cadastral Register under Czech law.

As a result of this fragmentation process, potential developers often face tremendous site (re)assembly problems, especially in the absence of instruments such as compulsory purchase, safely enforceable purchase options or effective pre-emptive purchase rights. Perhaps as a reaction to past decades of absolute state powers compulsory purchase arrangements are very limited and only possible when a site is zoned for a public interest facility or infrastructure on an approved land-use plan. But all these mechanisms exist to allow a developer to work towards assembling a site without going too much out on a limb in purchasing parts of a site before having the assurance that the entire deal and its planning approval will go through. Without the possibility of assembling sites back into single ownership, many brownfields will remain under used and/or be held back speculatively.

Communication and transport availability

Quality of communication infrastructure supports opportunities for land development. In the case of brownfields, the existing road network, power supply system, telecommunication system, water supply system and ducting system allows the saving of some of the pro-

spective investors' money. But the complexities and risks relating to such an infrastructure ownership or dilapidation may take part of this advantage away. Connections with metropolis-like centres are also essential as well as an accessibility to roads with vehicle transport being the dominant mode in the case of people and goods transport. Access to rail, water or air transport also significant and it is required to varying extents typical for each strongly urbanised region.

Centrally located brownfields also usually benefit from a high level of existing public transport provision. (For an example the ex TATRA site in Prague 9 lies between 2 tram lines, next to the district bus station, next to a major railway line, adjacent to the inner and the outer ring roads and also benefits from a private exit from the local Metro).

Existing Structures and substructures

The value of existing structures can be classified in many ways and buildings are valued for many purposes. The most important, but not the only, value is of structured economic exploitability (market value). Some structures although valueless or even with a negative value (due to the fact that they need to be demolished), may be located on a very valuable site which bumps up their transaction value.

If the existing structures on site can be economically reused, their value to the community and the owners is increased and the historical sense of place is retained. If the whole structure cannot be retained then at least their parts should be preserved in order to preserve the history of the site.

Technical and moral value of value of structures

It is assumed that a newly-constructed building is technically fully valuable. During utilisation the building gradually loses its technical value resulting from the durability of the

building materials. It is assumed for example that industrial buildings over 50 years old (and less) have no longer any technical value. The decreased technical value of industrial buildings may differ in comparison to the residual value of residential building or other buildings which may have a longer moral and physical cycle, as the industrial buildings are exposed to strong vibrations and shocks produced by machines, interaction of aggressive chemical substances and big thermal influences. Their life is also strongly limited by changes of industrial technologies and technical standards. A structure may be also technically sound, but morally outlived.

Historic value of structures

The historical value of buildings often outlives their technical, moral or economic value. Society protects this value with suitable historical buildings protection regulation. The scope and the mechanisms of such a protection may vary from country to country. It is now a commonplace for residential, vocational or commercial property to benefit from such protection, but industrial building are not always perceived for their cultural value and this may threaten their legal protection as well as their chance of survival. Industrial archaeology develops slowly it facilitates the regulation of archaeological surveys, description, valorisation and conservation of industrial monuments. Despite that, even if a building is not officially protected by legislation it may still have substantial historical value. Historical value of structures may be derived from their various aspects. Some of them are listed here:

- Uniqueness (first, best, smallest, largest etc....)
- Artistic or crafted quality of the structure
- Connection to an important historical event or person
- Urban context value (structure is valuable to the townscape)
- Skyline value (chimneys, spires and like...)

- Landscape value (building is valuable to the landscape)

The often huge size and sheer number of historically valuable industrial and other buildings and structures, often superfluous to the market demand, makes the process of their retention and reuse even harder. Thanks to an increasing social acceptance of the historical and aesthetic value of the urban environment, local communities may strongly object to their history to fall into ruin or worse to it disappearing under demolition. However, investors may feel restricted by regulations protecting monumental buildings, which they can view as an obstacle to desirable land development. A compromise is often necessary on the side of the investors as well as on the side of the historic protection regulators. The range of acceptable reuses of historically valuable buildings needs therefore to allow for more than a full restoration with as little interference in existing structures as possible. It has to allow for structures and buildings adaptation to new and modern uses, meaning substantial remodelling, reconstruction and conversion and up to the final possibility, which is demolition.

The necessity for adaptation to quickly changing technologies and modes of life have caused the frequent reconstruction or renovation of buildings. For these reasons there are not many buildings or groups of buildings that still retaining their original structure, which makes identifying the need for their protection more difficult. The most valuable buildings of the best preserved original form can be converted into museums of technology. They can also store and record the oldest and best preserved monumental machines and facilities coming from other buildings located close to factories being liquidated

One should remember that not only buildings or groups of buildings have historical value but that all kinds of monuments to industrial

activity, even industrial waste stockpiles may have this value. An example is the Falun region in Sweden, where one thousand years of metal-working have resulted in slag heaps of mining and smelting waste¹².

Existing Structures reuse potential

By analysing the susceptibility to transformation, with regard to this kind of building, the following three categories can be distinguished:

- the least susceptible, practically impossible to convert: monolithic technological buildings such as chimneys, freezers, ovens, containers, flyovers as well as buildings serving special technical functions such as shafts and hoist towers
- medium susceptible, difficult to convert, large and high or multi-storey monolithic buildings.
- the most susceptible, easy to convert: institutional buildings, smaller multi- or one-storey frame production bays with infrastructure and office buildings.

Table 15: Possibility of Industrial Structures Transformation

Industry	Kind of building	New way of utilisation	Comments
All	offices diners dressing rooms washing rooms laboratories low halls (up to 6m) insulated high halls (over 6m) insulated fire stations, repair shops motor roads railway sub grade silos, gases and liquids containers conveyors, galleries, flyovers, pipelines, heat-generating plants, water intakes and tanks, sewage treatment plants, gas reduction stations, power substations, telecommunication lines	offices, flats gastronomy offices, flats offices, flats offices warehouse, commerce, sport sports and entertainment halls conversion dismantling dismantling dismantling conversion for communal and industrial aims	road conversion depends on their location and class adjustment to suit communal purposes depends on location and parameters
Clothes and textiles	multi-storey and small (up to 5m) insulated and lit bays	offices ,schools, flats	
Engineering branch	multi-storey and small (up to 5m) insulated and lit bays	offices ,schools, flats	
Deep mines	chain dressing rooms, baths lamp rooms, control rooms sorting plant, washers hoist towers shaft top and hoisting machine structures	sport, swimming pools, gyms offices entertainment halls, commerce dismantling dismantling dismantling	conversion of sorting plant sometimes sport steel tower can be kept as local focus point

¹² Frelund A. (1991): „Swedish Planning in Time of Transition The Swedish Society for Town and Country Planning”, Gavle

Table 15: Possibility of Industrial Structures Transformation

Thermal power stations	turbine-rooms boiler-rooms, mills, electro filters chimneys and cooling towers transformer station and power substations	sports and entertainment halls dismantling dismantling dismantling	low chimneys are kept as relics
Steel mills, steelworks	agglomerating plant, blast furnace department, steelworks structures rolling mills, forges	dismantling dismantling	halls are too big and not insulated
Coking plants	ovens batteries, containers	dismantling	soil cleaning
Chemical plants	pipe installations, tanks, reactors, columns	dismantling	soil cleaning
Cement plants	rotary furnace	incinerating plants	
Food industry	all technological structures	dismantling	for sanitary reasons



Fig. 6.2 Processing plant and monumental tower of the Julia shaft in Wałbrzych (Poland) converted into museum of technology

Repair and strengthening of the structures

A change in building function is almost always accompanied by the need for reconstruction. It is usually connected with change of building superstructure loads and necessitates the removal of some elements of the superstructure. Such interference in the building construction system causes changes in the internal forces distribution, which often necessitates the reinforcement of some elements of construction. The need for reinforcing and repair works may also result from long-lasting usage in difficult conditions causing many mechanical defects arising from durability limits of materials used for construction. Remodelling or strengthening existing buildings is sometimes much more difficult and costly than designing and erecting new ones. Knowledge of old building technologies, the ability to carry out materials testing and having the equipment to enable such strengthening is required. The final decision of possible forms of reconstruction can only be made by experts with many years of professional building experience.

Also, some of the building material which is contained in the existing buildings may have been contaminated by the building's past use (oil, heavy metals, etc...). The effect of pollution inside a building on humans is especially serious, as it may represent prolonged exposure. That is why the contaminated parts of buildings, if they are considered for reuse, need to be removed and replaced by new, sound materials. Decontamination of oil-soaked concrete structures may mean removing the contaminated concrete, a tedious and expensive business.

Demolition

Demolition results in the removal of structures or parts of structures from the land surface and often also from the subsurface. Demolition and removal is often preferred by investors as an easy and fast option and it satisfy some of their objectives:

- it removes the stigma of pass use.
- it reduces the structural risks.
- it reduces contamination risks.
- it may help speed up the development process.
- it may proved to be more cost effective (cheaper than a complex reconstruction).
- it may produce higher development values for the site.

But demolition can also have negative effects:

- it uproots the historical connections of location.
- it is a costly process, especially where there is a large amount of material to be dumped.
- it is a less sustainable option regarding material use or reuse (material is carted away and new materials need to be brought on to site).
- it is a less sustainable with regard to transport.
- there are increased accident risks to workers and the public.
- it can produce public nuisance due to extensive dust and vehicles.

Demolition of structures usually also needs to be approved and is further regulated by national legislation (planning and environmental). A specialist demolition contracting certificate may be required for some type of demolition. Preparing or commissioning a demolition contract is specialist work.

Demolition only to ground level is sometimes being opted for, especially in a case to make the brownfields sites quickly more palatable to investors, or to remove visual blight and public hazard. This practice however leaves a large amount of problems in the ground which, due to usual lack of records on what exactly may have happened, then becomes an unexpected and expensive surprise to an unaware investor.

However, in situations where there is no market for dilapidated brownfields, the demoli-

tion to ground level and making-good the land by grassing or simple planting may prove to be a beneficial solution to the local community. Demolition can be also combined with the reuse of material (either as construction materials or as fill materials) on-site or off site. The on-site material reuse of may require the use of specialist mobile plant. (crusher, grader, etc). Reuse of demolition materials off-site and even on-site may be governed by national waste legislation, which could limit the reuse of this material.

6.5 Contamination

Contamination is usually (but not exclusively) a result of human activities (industrial, agricultural and others) related to land. Chapter 10 deals with related contamination issues in more detail . Contamination may effect:

- the air
- topsoil and the subsoil
- surface- or groundwater
- structures
- vegetation
- human health

When promoting the reuse of the brownfield land, measures need to be taken to record the potential risks related to past land use. Theoretically, there should be records or documentation covering the whole period of site use or production, allowing identification of the

type, range and possible effects of pollution. In practice, such documentation does not often exist, or if it does exist, it is not complete or is unreliable. Also, one needs to remember that society's perception of environmental and human risk acceptability is quickly changing and what is today considered a very risky process may have been, even only 20 years ago, considered a standard practice.

In most buildings and processes their users (customers, workers, managers, etc.) are those who possess the most valuable knowledge on what processes or substances were used and where they were used. Plants however close down, people move away or die and the memory of what went on dies with them. It then becomes necessary to employ specialists to establish the likelihood and type of risk related to past use of the site and its structures. This is especially important when land use will be changing to higher value uses, as in most national legislation the referential or allowable level of contamination is related to the land use.

Even on national or regional databases inventories of potential sources of environmental contamination are limited to a few survey points and coherent inventories are lacking. The following table gives an example of what happens when a coherent inventory is compiled:

Table 16: An increase in recorded cases in Dutch contaminated land inventories¹³

Year	Number of contamination cases entries	Assumption about remediation costs (billions of EURO)	Type of site
1982	2000	2	waste deposit sites
1987	10000	10	industrial locations
1995	200000	40	historical industrial locations
2003	400000	70	comprehensive survey
2005	700000		

¹³ VROM, RIVM (2003), updated

For example, when the reclamation project of Gdańsk Harbour was being prepared old maps and aerial pictures taken by allied forces during II World War were used (Fig. 6.3).

There are several levels of environmental pollution investigation, each suitable different purposes and at different stages of the project. Table 17 describes the main categories of investigation. National environmental legislation may prescribe or recommend the

exact formats under which certain categories of investigation are carried out and national regulating bodies usually certify or verify that the Risk Analysis Report recommendations are acceptable. In some cases national legislation regulators may also need to certify, on completion of remediation, that the agreed remediation limits were adhered too. Special qualifications and certification is usually needed for anything above an outline investigation.



Fig. 6.3 Examples of historical information used during Gdańsk Harbour reconstruction; aerial map from II World War(a) and preserved plans dated 1929(b)¹⁴.

Table 17: Types of environmental investigations

Type of investigation	When it is needed	What for	Who does it and what is needed	Output	How much
Outline investigation (desk search from publicly available information)	for considering land-use changes for first consideration of site acquisition	to establish whether there is a likelihood of a contamination problem	experienced professional access to public records and those who may remember what went on site	short report indicating site use history and the likelihood of contamination.	relatively cheap, 1-2000 Euro, according to complexity
Environmental audit	When there is a need or a reason to know more	to record in detail what risk processes and substances were involved, where they are located and to identify grounds for no action, monitoring and further action	specially certified engineer, minimal, generally non-destructive equipment	report identifying and recording the individual risk activities and substances	moderate cost

¹⁴ Poborski P. (2004): "Project management and risk management for brownfields revitalization process", Proceedings Lepob Seminar 17.12.2004.

Table 17: Types of environmental investigations

Site environmental pollution investigation	When it is necessary to prove the type and scale of contamination	To establish the amount and type of pollution substantial site structures, soil and water investigation based on extracted and laboratory tested samples	specialised and certified company drilling and specialist analytical equipment and an independent laboratory services	large report, presenting the site investigation information	expensive
Risk analyses	When the site investigation identifies substantial pollution	evaluates all available information arising from site investigation, intended site use and sets the major parameters for the remediation work	specially certified engineer or company	report containing a set of measures and limits for site remediation project	moderate to expensive

Training may be needed for engineers to carry out just the outline investigation. A certified training course was used to train some of the existing UK professionals. These now supply outline investigation services for site purchase, planning and land-use changes purposes. These are some of the sources for the desk search outline investigation.

- Records kept by the entity (company, army unit) located in the area of planned revitalisation. If the company’s activity resulted in potential harm to the environment it was usually obliged to carry out permanent monitoring.
- Archives of communal, district and provincial offices. Most alterations introduced by companies required submission to local authorities and their approval.
- Archives of state services such as the Provincial Inspectorate of Environment Protection, also from the Regional Disease Control Centre - specialised in measurement and estimation of environment conditions.
- Survey conducted among local residents and former workers. Data obtained in this way should be treated very carefully as there may be some subjective factors.

- Other sources of historical information/ data.

The most important component of an environmental pollution hazard is the hazard to health. It can be defined as the quality and quantity indicators of negative and positive health results appearing in people who were exposed to it and as the effects of a harmful factor influences. On individual brownfield sites the exposure and related risks may be influenced by the following elements :

- Characteristics of the area.
- Identification and choice of chemical compound indicators (evaluation of relationship-dose response).
- Assessment of the exposure of people to danger during specific scenarios of exposure (frequency, durability of exposure).
- Estimation of chemical substances toxicity (carcinogenic and non-carcinogenic).
- Characteristics of risk.

Possibilities for some of the polluted brownfields reuse are, in a way, a function of their pollution. This means that the greater the pollution the higher are the likely costs of rehabilitation. This then directly reduces the chances of site future utilisation. Under such condi-

tions of severe pollution effective remediation can happen only in locations where the market is able to bear such costs or in locations where there is a public subsidy available to cover them. What is actually in the ground can be made clear by site investigation, however it can be proved only by actual remediation. Sometimes it need not be the cost of the remediation which is the main problem but the time it takes to remove it (for example polluted groundwater may take several years of pumping to remove the pollution to the level agreed by the risk analysis) and time, as we all know, costs money. There are therefore serious cost risks related to site remediation. Experienced consultants and reliable site investigation of the environmental risks help to keep down unplanned costs of rehabilitation, thus increasing the project's chance of success. Illustration 6.4 presents a model scheme of a solution to environmental risk.

Green and environmental issues on brown-field sites

Nature is a great healer and underused or abandoned sites are great opportunity for number of species to establish their domicile. Some of these may be quite rare and are encouraged in their habitat by the particular type of site pollution. Considerations related to environmental protection and retention of habitats may influence and sometimes even hamper the development of such a site. Others species may be of a more common type, but over the years even the most ordinary seedling develops into a tree with a trunk diameter above 15 cm. This trunk size, in many countries, can afford such a tree further environmental protection, and permission may be needed to remove it or requirements may be placed for replacing or even replanting it.

Nature can also work as a healer for contamination. Some plants have the ability to extract polluting elements. This may be a great method of pollution extraction but a catastrophe when local people are growing such plants in their contaminated gardens for human or

animal consumption. Other plants can even convert the selected polluting elements into elements that are harmless or even beneficial to environment.

Natural attenuation is a process in which nature is able, over the years, to eliminate certain levels of pollution. These can be organic or inorganic pollutants. A selected type of bacteria can, through a process called 'enhanced natural attenuation', speed up the time in which Nature can deal with contamination. Natural attenuation and enhanced attenuation are techniques that do not give results overnight and land may need to be taken out of normal use for number of years (sometimes 50 and more). Also, this process needs to be monitored to assess what is happening and that it is happening is in the intended and predicted way. But the main advantage of such a process is that it is relatively cheap, therefore suitable for sites which are of no commercial interest (such sites are very common). However, an important element here is the visibility of the remediation measure in a land registry. Over the years, site notices disappear, fences rot and memories fade. Publicity of such a measure in the land registry is make sure that buyers are aware of the environmental clearance regime that may affect such a plot.

6.6 Risk management and risk communication

Risks related to brownfield sites reuse for investors, regulators, consultants and public exceed the risks of greenfield development. But the risks for the individual stakeholders may not be the same as the risks of the others. For example, risks related to purchasing the site and site title are those of the investors and their legal and real-estate advisors. But despite that the public, who carry no part of such a risk, may be affected by the investors long and protracted arguments over the site title - for example, development does not proceed until agreements have been reached. Table 18 illustrates the major risks for various stakeholders.

Table 18: The major risks for various stakeholders

type of stakeholder	Type of risk				
	legal	financial	technical	health	other
investor, financing bodies	x	x			
developer	x	x	x	x	x
lawyer	x	x			
property consultant	x	x	x		x
environmental consultant	x	x	x	x	x
design consultant	x	x	x	x	
local government	x	x			x
public				x	x

Risks can be effectively managed when objectives for their mitigation are clear and are correctly set at the outset. The following table illustrates the principal ways in which risks to brownfield sites can be mitigated or transferred. In the mitigation category description “other” usually belongs the experience of:

- the investor
- the developer
- the professional team
- the approving and regulating bodies
- public communications and PR

Table 19: Possible methods of brownfield risk mitigation

type of risk	type of possible mitigation				
	commercial insurance	contractual warranties	Penalties	performance bonds	other
site acquisition		x	x		x
financial viability					x
legal liability developer	x	x	x		x
legal liability consultant	x	x	x		x
real estate liability	x				x
contractor’s liability	x	x	x	x	x
liability of developer arising from project	x	x	x	x	x
environmental liability	not yet locally available but soon possible	x	x	x	x
third party liability	x	x			
planning risk		x			x
public protests risks					x

Sufficient specific brownfield development-related experience of the developer and the design team is the mayor key to brownfield project risk reduction. For example, in the case of environmental pollution, testing carried out in an incompetent way may result

in incomplete, incorrect recommendations which may even cause a threat of pollution relocation (e.g. Sampling by drilling though water-bearing layers). The same applies for other consultant’s work.

The most important component of environmental hazard is the hazard to health. It can be defined as the quality and quantity indicators of negative and positive health results appearing in people as an effect of harmful factor influence. It is assumed that it includes the following elements :

- Characteristics of the area.
- Identification and choice of chemical compound indicators (evaluation of relationship - dose – response).
- Assessment of the exposure of people to danger during specific scenarios (frequency, durability of exposure).
- Estimation of chemical substances toxicity

- (carcinogenic and non-carcinogenic).
- Characteristics of risk.

Possibilities of conversion are, in a way, a function of the pollution. This means that the greater the pollution the higher the costs of rehabilitation will be and this limits the possibilities for site utilisation (which can only then proceed when the market is able to bear such costs or where there is a public subsidy available to cover them). Reliable estimation of site environmental risks helps to keep down unplanned costs of rehabilitation, thus increasing the project’s chance of success. Illustration 6.4 presents model scheme of solution to environmental risk.

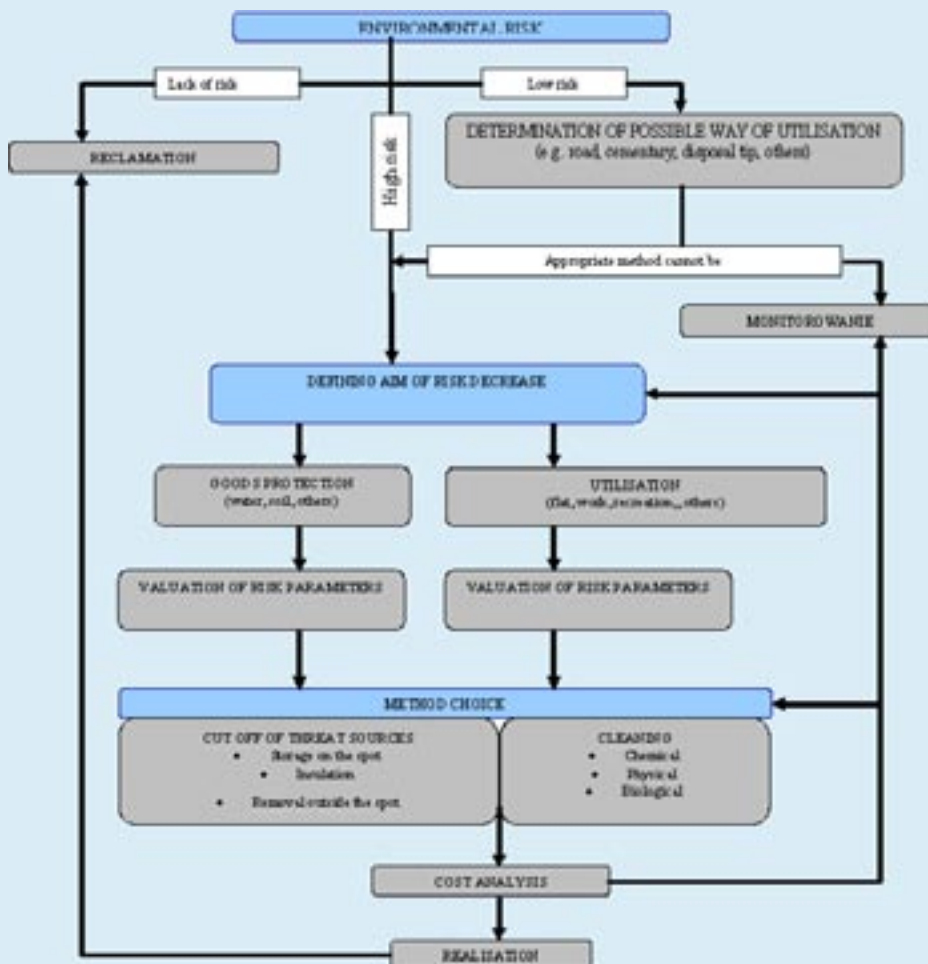


Fig. 6.4 : Process scheme of solutions to environmental risk caused by polluted areas¹⁷.

¹⁷ Gasidlo K. (1998): „Transformation Problems of postindustrial areas”, SUT Gliwice

Soil management

When is soil a soil and when is a soil waste or hazardous waste?

The most sustainable management of soil is when all the soil (from groundworks or excavation) is used on site. The same can be said about the demolition materials, for example demolition rubble, but this is not always possible. When projects on brownfields are considered, especially the larger ones or the ones which have a large amount of structural or groundwork changes, then the soil management methods need to be planned and considered. Soil management can be included in remediation works to the site as well as in the actual project development stages.

In some countries it is the increase in the cost of soil dumping as well as the building permit requirements that is putting pressure on developers to consider maximum retention and reuse of soil and other materials on site. Techniques of cleaning soil on site, trapping pollution on site, soil-cleaning off site and returning it to the site have developed in a response to this. Handling excessive soil and contaminated soil requires early considerations, which may reflect in the whole project design approach. In the most advanced approaches the design of the future project is considered in conjunction with remediation and soil management. This actually helps to relocate the most severe pollution to parts of the site when it may not matter as there will be no likelihood of human or other exposure (left for example under basements or car parks). The cost of remediation or removal of contaminated soil from site may have great influence on an individual project's actual financial performance. If pragmatic decisions and new soil remediation techniques can keep these costs down (often by keeping and enclosing the contaminated soil in-situ on site), it will increase the possibilities for the revitalisation of more brownfield projects.

The EU directive actually bans the dumping of polluted soil, therefore dumping is only

possible for soil deemed to be unpolluted. National legislation interprets this regulation in different ways and the actual definition of soil considered as waste may vary from country to country.

Geotechnical effects on soil

The range of geological changes caused by the development process of previous use depends on the type of industrial activity carried out in a given area. Because of the depth of these changes the following can be distinguished:

- Areas with no or very little changes. Buildings related to activity in this area are small, with relatively shallow foundations (approx. 2metres below the surface) and the land was never a place for waste disposal.
- Areas of changed soil structure near to surface (up to 5 metres). Areas after demolition of industrial buildings, small dumping grounds and shallow excavations. New buildings can not be footed using regular methods of foundation work (e.g. spot footing, continuous footing).
- Areas of significantly changed soil structure. High dumping grounds, stockpiles (so-called out-of-control embankments). New buildings footings requires a special method (soil replacement, compaction, soil reinforcement, piling).

Erosion, sedimentation, natural succession strength

Erosion usually has an adverse influence on the condition of brownfield sites. For example erosion caused by weathering may destabilise slag heaps and excavations, hindering plant root support thus creating landslides. In the case of buildings, erosion may cause loss of their technical and utility value. Structure failure caused by water, wind and air also leads to soil formation which in turn enables the development of flora on parts of the structure

where they may cause further damage. An intensive natural succession and rare species occurrence is common on disused brownfield sites.

6.6.1 Use of selected industrial wastes for rehabilitation

The main sources of pollution in mining-based urbanised areas are mining, smelting and power industry wastes which are usually initially kept above ground in spoil heaps. Only about half of these materials ever finds a new use. However, techniques accelerating such reuse are developing.

Thanks to varied granulometric, mineralogical and chemical content some of the industrial wastes may actually accelerate and facilitate the site and soil rehabilitation process. This process has to be carefully managed so that the actual “dosing” does not exceed the amount of substances causing ecological threat in the rehabilitated substrate. For example:

- Coal mining wastes may be used for the reclamation of ferrous and non-ferrous metallurgy as well as power cinder tanks.
- Carbon slimes can be used for the reclamation of rock and coal waste stockpiles.
- Power wastes are a useful substrate for coal mining waste rehabilitation (they limit pyrite weathering).

6.6.2 Subgrade strengthening methods

Some parts of brownfield sites, especially the industrial ones may have been used as a disposal tip for different types of wastes and are actually made-ground or on a made-ground. It happens that in a seemingly established built-up or naturally wooded area there are hidden pockets of old stockpiles and garbage dumps under several centimetres of soil. This may cause an incidental bedding of such soil, the possibility of voids, an unusually low bearing capacity or insufficient consolidation, all of which result in problems with the foundations

of any existing and new buildings. To ensure the safety of foundation works soil strengthening or its replacement up to subsoil level is necessary. Methods of soil facilitation aim to include an increase in bearing capacity as well as reduction of settlement, decrease in water permeability and an increase in the resistance to dynamic loading:

The following factors need to be taken into consideration when choosing a subgrade strengthening method:

- Required loading capacity, rigidity, compressibility and permeability parameters related to aims.
- Area morphological characteristics, area size as well as strengthening required, depth, type of soil and its properties.
- Access to the materials needed for strengthening.
- Time required for construction works and their costs.
- Influence on the environment.

Meeting the last condition is often neglected when options for planning soil strengthening methods are being considered. However, it should be kept in mind that any internal interference in subgrade is practically irreversible. Materials incorporated into the subgrade are subject to the standards and regulations concerning building materials and these are often less strict than standards concerning the soil and ground qualities. Civil engineers choosing strengthening method should analyse the possible consequences (erosion, change of water relations, water pollution, and influence on adjacent buildings).

6.7 Project management and subcontracting

Project management of brownfield projects comprises more phases and carries much more risk than of that of an ordinary project, especially when the developer and his project team are also handling the site remediation. Having a clear development objective at the

outset of the project helps the project team's decision-making, risk handling and mitigation. The main difficulties usually occur during the first phases of project realisation. That is acquisition, remediation and planning. Structures on brownfield areas are normally the remains of heavy industry. Technological issues such as those buildings of massive construction and are difficult to dismantle and sometimes the only possible method of removal is explosive demolition. Because of such factors the investor should :

- > Ensure safe working conditions for chemically contaminated areas.
- > Have permission and contingency for storing removed building site waste,
- > Guarantee suitable equipment for hard demolition works,
- > Have experience and knowledge of explosive demolition methods.

Choose contractors very carefully. Specialist brownfield related knowledge is required for working on such projects. Handling and commissioning remediation work requires a specialist understanding, in order that the development objectives, value for money and risk mitigation is achieved

6.8 Due diligence chart

Change planning is usually subordinate to a local area development plan. Local community needs should be expressed in the adopted transformation process.

The reconnaissance phase is the first and also the most important step in the transformation structure. Strongly urbanised regions are usually packed with degraded areas. State institutions and private investors' funding do not allow for complex land reclamation and this is why their appropriate selection is so important. In the reconnaissance phase the following should be done:

- Classification of land suitability.
- Estimation of the environmental, economic, social and technical risks. Opportuni-

ties to avoid potential hazards should be analysed.

- Estimation of the transformation possibilities.

Due diligence should minimise risks and protect investors from liability in real-estate and other business transactions with an all-in-one information service that puts him on a secure legal footing. The audit investor should:

- Handle with confidence brownfield redevelopment projects and multi-interest, commercial, and industrial real-estate transactions.
- Review of historical land records.
- Get ongoing coverage of the news. Know the latest requirements and be fully prepared to act on changes and trends in the law.
- Read commentary and analysis by recognised experts and authorities.
- Identify sources of environmental risk.
- Hire and evaluate an environmental consultant.
- Conduct a site review (sampling of soil and groundwater).
- Purchase comprehensive general liability and property insurance.
- Negotiate and interpret an environmental assessment.
- Anticipate cleanup requirements and costs. Determine appropriate remediation techniques.

BOX 5: Case Study Wałbrzych

In 2004 the city of Wałbrzych ratified the „Local Revitalization Programme for the period 2004-2006 and beyond“. This programme includes the microprogramme „KOPALNIA („The Mine“), to be carried out in the grounds of the museum in the Thorez mine, a facility which was shut down in 1996 and is now included on the heritage sites list. This microprogramme includes actions carried out by various beneficiaries. The aim is to create (formulate, develop and promote) an attractive tourist location

based on using former mine facilities for new economic and social functions.

The goal of the KOPALNIA microprogramme is to create employment opportunities in the tourism sector. – This is to be achieved through the development of construction and renovation companies (in order to restore buildings and the equipment of the former mine, as well as the grounds of the mine to a good technical state), the employment of tour operators and firms offering guide services and individual guides, building managers, security personnel, services such as cleaning, catering, sports companies, publishing companies, souvenir manufacturers (hand made items etc.), the development of a hotel for tourists and other services - which will contribute to local economic growth and increase the potential of the city. Former miners who lost jobs as a consequence of industrial restructure will have the opportunity to find new employment.

Among the activities included in the microprogramme are:

- 1) Improvement in the technical condition and restoration of heritage buildings, devices and equipment of the mine as part of the Museum of Industry and Technology
- 2) Making the mine accessible to tourists (in particular through removing the flooding of the so-called Fox Adit - Lisia Sztolnia) and creating tourist attractions (tours through the mine corridors, rides in coal wagons, displays of mining devices and miners' equipment,) creation of a multimedia environment (e.g. simulating the sounds of working mining equipment, projection rooms for films, mining memorabilia such as documentation of activities, accounts of rescue actions, biographies of the miners).
- 3) Removing all corroding steel items (rails, wagons etc.) from the mine shafts in order to eliminate environmental pollution. After this is carried out the mine plumbing system can be utilized by the Walbrzych water company.

4) Development of a cultural and tourism infrastructure - exhibition rooms, concert halls, cinemas, cafes, libraries, restaurants, museums, toilets, parking facilities and souvenir shops.

5) Development of the social infrastructure - creating spaces for non-governmental organizations (associations, youth clubs, students clubs) and cultural centers (part of the existing rooms to be adapted for artistic workshops and hobby workshops etc.)

6) Development of an educational infrastructure - rooms for various classes and lectures intended for schoolchildren, students and adults who wish to participate in courses that will allow them to gain new qualifications and skills

7) Adaptation of interiors and creation of a recording room for music and a public library, as well as a public Internet room.

8) Promotion of business tourism - adaptations of interiors into conference halls, restaurants, shopping centers, service centers, toilets and parking facilities.

Through making the adapted facilities available to non-governmental organizations, cultural and artistic institutions it will be possible to:

- 1) Organize various regional holidays and festivities to present the work of disappearing professions - for example the hard and dangerous work of a miner, to promote the idea of protecting technical heritage and the development of industrial tourism.
- 2) Organize of a permanent exhibition presenting the history of Walbrzych as an industrial city (mining, glass and porcelain smelting, production of trains and streetcars, the economic zone etc) as well as organisation of temporary exhibitions, conferences and seminars and fairs such as antique markets.

The final concept of the „KOPALNIA“ micro-programme will be developed as a cooperative venture between cultural institutions as part of the development process of a tourist brand - „The Walbrzych Tract“ - for the city of Walbrzych.

The beneficiaries of the program will include, among others, the Commune of Walbrzych and non-governmental organizations.

Financing of infrastructural activities: ERDF and social projects of the ESF.

7. Economic aspects of brownfield regeneration (author of the chapter Dr. Paul Nathanail)

This chapter is based on the findings of CABERNET during the period 2002-2005. CABERNET continues its multi-stakeholder approach to sustainable brownfield regeneration and for current information readers are directed to www.cabernet.org.uk.

One of the major drivers of brownfield regeneration is the economic viability of individual sites. This can be affected by many different factors which can alter quite considerably over time. The economic status of a site can be affected by:

- indirect as well as direct costs of the regeneration.
- predicted revenues / returns from the site.
- the type of financing and the associated financial risks.
- national and local taxes and their perceived risk of fluctuation.
- any development agreements between the land owner and / or the municipality and the developer.

Conceptual models challenge conceptual thinking regarding the brownfield regeneration process and therefore help to broaden the way decisions are made about individual sites. CABERNET has been better able to assist national policy developments by the experiences gained through developing and considering the range of conceptual models available. The models have been used extensively in the CABERNET dissemination activities and notable positive feedback has been received.

Using a conceptual model to characterise different types of site, in terms of their economic viability and highlighting how status can change based on variation in location standing, site treatment costs and other economic conditions, can help policy makers identify strategies that can improve the economic

viability and status of sites. Different types of brownfield regeneration projects, represent-

ing their economic status, can be illustrated by the fig.7.1.

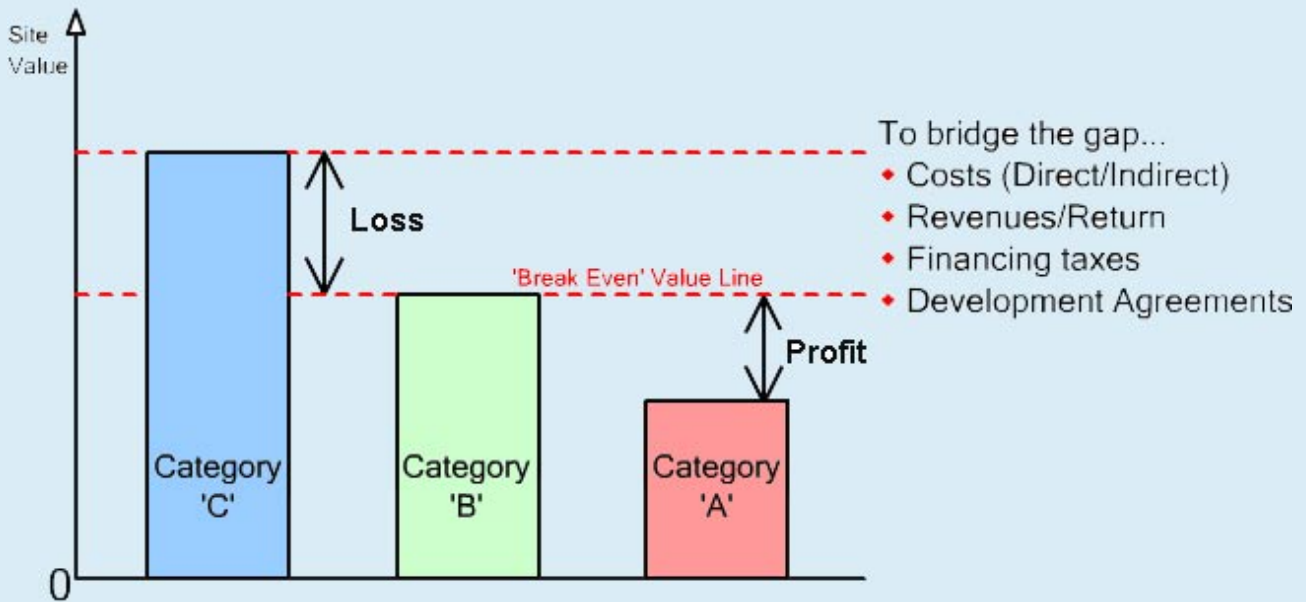


Fig. 7.1: The Economic Components of the A-B-C Model (According to CABERNET 2005)

The CABERNET ABC conceptual model identifies three types of sites according to their economic status (for example due to the cost of regeneration, the value of the land, etc). Sites are classified as:

- A Sites – these represent sites that are highly economically viable and the development projects are driven by private funding
- B Sites – these sites are characterised as being on the borderline of profitability. These projects tend to be funded through public-private co-operation or partnerships
- C Sites – are not in a condition where regeneration can be profitable. Their regeneration relies on mainly public sector or municipality driven projects which are of low economic viability. Public funding or specific legislative instruments (e.g. tax incentives) are required to stimulate regeneration of these sites

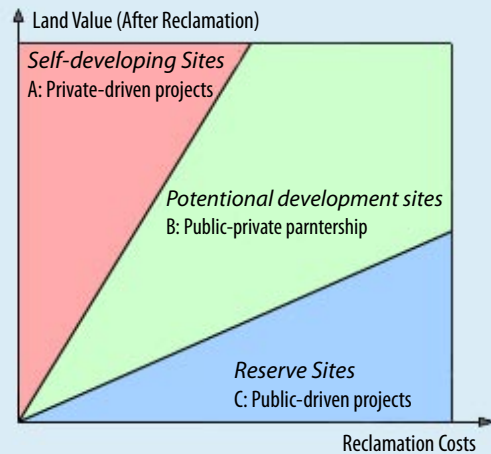


Fig 7.2: The A-B-C Model (According to CABERNET 2005)

The A-B-C model highlights the funding drivers for brownfield regeneration. This conceptual model can be used to assist institutions that are responsible for regional development and investment by allowing them to characterise strategies for dealing with different types of brownfield land. By identifying the type of site and considering the factors that are affecting a site's category, i.e. if it is an A, B, or C site,

both public and private bodies can examine intervention options and regeneration strategies. Using this conceptual approach to examine the factors that affect re-categorisation of a site, for example from a B Site to an A site, can result in the development of site-specific strategies which can also be useful. A number of municipalities are currently using these categories to review their local brownfield strategies and to produce informal inventories of regional brownfield sites¹⁸.

Policy and Regulations

CABERNET has pointed out that the revitalisation of the growing number of brownfields in Europe is an essential part of improving European global competitiveness in a sustainable way. Specific brownfield dimensions are needed in emerging EC thematic strategies and other policy initiatives to enhance sustainability and therefore enhance European competitiveness.

Dedicated regeneration Agencies can potentially offer a range of benefits in delivering sustainable solutions to the brownfield problem. CABERNET believes it is important to critically evaluate the role of dedicated agencies to better understand their potential impact.

Local governments play a key role in urban regeneration and development. They set the boundaries of development activities by local planning regulations, land-use and zoning plans, thus trying to prevent undesirable urban sprawl. They also play an active role in promoting urban regeneration by providing a policy framework and resources that can bring about the regeneration of urban brownfield sites throughout Europe. By accomplishing this task local governments need to inter-link with neighbouring communities as well as at a regional, national and European level. Brownfield specific strategic approaches are

needed for regeneration at the local government level. Drawing up brownfield policies at the national level will not eliminate brownfield sites without the active involvement of local governments. Brownfield strategies are clearly linked with urban planning and development strategies and hence they are the responsibility of the local government. Without a local component in any brownfield strategy, national regeneration schemes sometimes focus only the sites themselves, without examining the wider impact of the intervention regarding the whole surroundings. Urban renewal strategies have to be based on reliable data and the local government is considered to be the best level at which to collect these data.

Brownfield development is relevant to a number of the EU's key policy fields, such as: regional policy, transport, soil protection, economic development and the environment. In several of these fields regulation and policy is already fairly mature, in others it is emerging. It is important to set out where the existing links have been made and to identify areas for further, or potential, development. It becomes clear that Brownfield Redevelopment fits in well in several sustainable EU strategies, establishing policy links and bridging the gaps between the EU and the regional and municipal level in the member states.

CABERNET has drawn a number of conclusions concerning the economic aspects of brownfield regeneration. A significant proportion of brownfield land is not commercially viable in the foreseeable future (C sites). Such persistently unused brownfields often have adverse effects on sustainability including the competitiveness of European regions and cities. CABERNET believes that EU and Member State funding is necessary for and should be used to return non-viable sites to beneficial use (e.g. permanent or transitional low-intensity activities). The cost : value gap prevents the development and regeneration of many mar-

¹⁸ REFERENCE to add

ginally commercially non-viable brownfield sites (B sites) across the European territory. EU competition policy has the unintended effect of restricting the ability of member states to develop public-private partnerships to facilitate the regeneration of commercially non-viable sites, other than where the private sector partner is an SME, and / or the site is located in an assisted region. CABERNET believes effective public-private partnerships, that have been designed to bridge the cost-value gap that often prevents the commercial regeneration of many marginally non-viable brownfield sites, should be exempt from EU competition policy.

Financial Risk Management

Financial risk management involves risk reduction, loss reduction or some combination (Finnamore et al. 2002). Risk reduction can be accomplished by risk avoidance or risk control. Residual levels of risk can be financed through insurance, captives, bonds or other financial finite risk instruments. Risk transfer should seek to ensure that the liability does not return in the event of the transferee becoming insolvent. Usually some combination of techniques is involved to provide 100% cover for the liability.

8. Real-estate aspects (author of the chapter Dr. Paul Nathanail)

Learning outcome – “awareness level”

- o After reading this chapter you will be aware of the following:
- o The aim of this chapter is to develop awareness of the real-estate aspects relevant to engineers in brownfield regeneration.)
- o Regeneration takes place on a number of scales – from an individual plot of land through to entire neighbourhoods. A masterplan comprises both the process for analysing and preparing strategies, and the proposals needed to plan for major change in a defined physical area. ‘Spatial masterplans’ set out proposals for buildings, spaces, movement strategy and land-use in three dimensions and match these proposals to a delivery strategy (Urban Task Force, ODPM 1999). Spatial masterplans are supported by financial, economic and social policy documents and delivery mechanisms, without which the spatial plan has little meaning or likelihood of effective implementation¹⁹
- o Engineers have a minor but not insignificant role to play in master planning. Engineering aspects – opportunities and constraints – can influence the cost of different options. Of course the final decision about the acceptability of different costs rests with the client or funder.^{20, 21}
- o Masterplans are only required where the scale of change is significant and the area subject to change is more than a few buildings. The spatial masterplan can be described as a sophisticated ‘model’ that:
 - shows how the streets, squares and open spaces of a neighbourhood are to be connected.

¹⁹ (CABE 2004).

²⁰ CABE. 2004. Creating successful masterplans. CABE

²¹ Rogers, Richard (Lord Rogers of Riverside) (1999) & Office of the Deputy Prime Minister, Towards an Urban Renaissance, ODPM, London

- defines the heights, massing and bulk of buildings.
- sets out suggested relationships between buildings and public spaces.
- determines the distribution of activities/ uses that will be allowed.
- identifies the network of movement patterns for people moving by foot, cycle, car or public transport, service and refuse vehicles.
- sets out the basis for provision of other infrastructure elements such as utilities.
- relates physical form to the socio-economic and cultural contexts and stakeholder interests.
- allows an understanding of how well a new, urban neighbourhood is integrated with the surrounding urban context and natural environment.

8.1 What is land?

- Land – ground, earth, terrain, terra firma. Land extends beyond the surface of the earth. The earth’s surface, extending downward to the center of the earth and upward infinitely into space. (www.co.saint-croix.wi.us/Departments/RegisterOfDeeds/definitions.htm).
- Massachusetts (<http://www.massrelaw.org/glossary/r.htm>) considers land to be a general term which includes the ground and those things of a permanent nature such as trees, crops, oil and minerals in the ground, unless specifically excepted.
 - o Land and anything permanently affixed to the land, such as buildings, fences and those things attached to the buildings, such as light fixtures, plumbing and heating fixtures or other such items which would be personal property, although in some states a fine distinction may be made.
 - o May refer to rights in real property as well as the property itself.
- Economists define land as comprising all naturally occurring resources, such as geographical locations, mineral deposits, and

even portions of the electromagnetic spectrum. Land is one of the three functions of production; the others being labour and capital.

8.2 Who controls what happens to land?

- The concept of land is very closely associated with the rights of different parties to control what happens to land. In some legal domains, land is used as equivalent to real estate – in the sense of buildings, infrastructure and services. There is often an element of the built, the artificial or that introduced by man.

Table 20: Control of land
Owner
Former owner
Occupier
Regulator (environment, heritage, land use, building development)
Banks, lenders, insurers
Mineral rights owner
State
Crown (in UK owns gold)
Licensee (groundwater abstraction)
Neighbours

- Owners are accorded certain privileges over their land.
- Former owners may constrain the privileges of future owners through including covenants in the property deeds.
- Occupiers have control over land to the extent permitted by the owner of the land. In some cases occupiers without such permission may also acquire privileges.
- Governments and other authorities have set up regulatory bodies to control what happens to land, to prevent damage, to protect valuable features and to remedy or ensure the remedy of any damage that might be caused. Environmental regulators regulate the impact of land and activities thereon on the environment – air, water, ecosystems

and perhaps human health. Cultural and natural heritage may have local, regional, national or global significance. Landowners have obligations to protect certain heritage. Land use planning systems control what can happen to land. In some domains certain activities can take place without recourse to the planning authorities. Building control regulates how permitted development is to be carried out.

- Banks, lenders, insurers may rely on the value of land as security against their financial support.
- The rights to exploit minerals beneath a site do not necessarily belong to the land owner. They may belong to the State or certain individuals. For example in the UK ores of precious metals belong to the Crown. The privilege of abstracting water is usually controlled to prevent adverse impacts on aquifers or surface water bodies.

8.3 Who is affected by what happens on land?

- As well as those who can exert control or at least influence on land, others may be affected by what happens to land.
- Neighbours to a site may be positively affected by regeneration. Visual aesthetics can improve. New jobs can be created. New facilities may become available. They can also be negatively impacted by regeneration – land prices rise so that housing becomes unaffordable. Traffic congestion increases. Infrastructure becomes overloaded. The capacity of local services such as schools and health care are exceeded.
- Society at large is also affected. Public funds may have been used to support local regeneration. These funds could have been spent – or better invested – elsewhere. Benefits through increased tax revenue, reduced crime rates or improved quality of life can ripple out from a large regeneration project.

8.4 Who influences what happens?

- Chapter deals with the involvement of citizens in the decision making process. In some countries there is a long standing tradition of public consultation and engagement. The effectiveness of such traditions and the effectiveness of public participation is not necessarily high. Consultation processes can involve merely going through the motions to end up at a pre-determined result. The ability of individual citizens to see the greater good is open to question. Large public engagement processes certainly slow down the decision-making process but whether they prevent bad decisions or improve good ones is not proven.
- Mis-information or deliberate dis-information can have unduly negative impacts. Secrecy is also a good way to allow rumours and speculation to spread.

8.5 What limits are there on what happens to a brownfield site?

- Richard Florida would perhaps claim that insufficient creativity and innovation is the main limit. However this section explores the constraints on land use options on a site. Most of these constraints apply to all land-use development and not specifically to brownfield sites. In certain cases it could be argued that the imperative to regenerate brownfields coupled with a desire to reduce greenfield development and hence reduce urban sprawl should result in some of these constraints being relaxed or removed for brownfields. It could also be argued that some constraints should be strengthened for greenfield sites.
- Many Laws limit what can be done on a site due to its location, former uses, neighbours.
- The Deeds assigning ownership of the land can preclude certain land uses or require only certain land uses. Deeds of Residential properties for example often prevent business uses.

- Occupiers of land will be bound by the terms of the contract under which they have occupancy. Leases contain mechanisms to both limit and extend the liability of the incoming tenant. Pie crust leases for example restrict the tenant's rights and duties to structures above a certain horizon – be that the base of the foundations or some arbitrary, very shallow, depth below the surface. Repair clauses in leases require tenants to make good any damage they cause. More stringent forms of such clauses can require repairs of damage discovered during a tenant's occupancy of a site even though they did not cause the damage. Historical contamination could be such a form of latent damage that the unsuspecting tenant ends up having to 'repair'.
- The Rights of others place constraints. These could include neighbours who have a right to limited noise levels, to cross part of a site to access their own land or to see the character of an area maintained.
- Spatial land use plans exist at various scales. These lay down what types of land use will be permitted by regulatory authorities in different parts of their area of jurisdiction. Landowners – as indeed anyone else – usually have the chance to comment and therefore influence such plans before they are 'adopted'. Environmental factors such as flooding or seismicity are often incorporated into such plans. Such factors certainly inhibit some forms of land-use while prohibiting others.
- Cultural and natural heritage can develop on a brownfield site. The cultural heritage may be the derelict buildings themselves – the mine shaft, the chimney stack, the pottery oven. Natural heritage in the form of rare plants, animals or indeed entire habitats may develop as a result of the former industrial activity on a site. Balderton Land-fill in Nottinghamshire is home to many rare orchids because its waste has a high pH which these sensitive plants thrive on.

Wigan, in northwest England, has several Sites of Special Scientific Interest (SSSI) that are flooded subsidence basins caused by collapse of bedrock after coal mining.

- Landowners owe a Duty of Care to their neighbours and people on their land. In the UK this Duty extends to the provision of lateral support to a neighbour's land and providing for the safety of anyone entering the land – whether with or without permission.
- Contracts set out what is expected from each of the parties to the contract. They limit both the rights and the responsibilities of parties. In the UK contractual conditions are controlled by law. Certain requirements even if entered into voluntarily would be deemed to be illegal and therefore null and void.

8.6 Information

- o The value of real estate is said to be influenced by three factors – location, location and location. While not wishing to contradict this truism, it could also be said that a person or organisation will assess whether or not they wish to own or occupy the land on the basis of the information made available to them about the land.
- o Information of use to potential investors, occupiers or developers includes :
 - Current formal and informal land uses.
 - Former land uses.
 - Spatial land use plan allocation.
 - Available infrastructure, utilities and services.
 - Local real-estate market conditions.
 - Environmental context.
 - History of regulatory permitting and enforcement actions.
 - Records of remedial action taken.
- o Various national laws and proposed EC initiatives offer potential buyers/occupiers the right to certain information about the real-estate they are considering.

9. Financing Brownfield Redevelopment (author of the chapter Dr. Paul Nathanail)

Learning outcome – “awareness level”

After reading this chapter you will be aware of the following:

- o Brownfield regeneration is not cheap! Funds usually come from a variety of sources at various points in the regeneration process. The expectations of funders vary but some sort of return on expenditure – whether financial, social, environmental or political is expected.
- o Private sector financial investors ideally want low risk and high rates of return. The relationship between these two factors – and the way they are perceived – dictates the availability of funding and the degree of control a funder expects to have on a project.
- o The aim of this chapter is to develop awareness of the financial aspects relevant to engineers in brownfield regeneration: who pays; who gets paid and for what; who benefits and who carries the risk.
- o Finance comes in several forms:
 - o Investment – whether high or low risk.
 - o Loans.
 - o Grant/ Aid (Charity) in the form of EC Structural, National or Regional funds.
 - o Hybrids – combinations of the above.

9.1 Normal bank loans

- Banks lend money for specific purposes in exchange for repayment of the loan plus an additional interest charge. The bank's funds are usually safeguarded by having a stake in the value as some form of security. In the event of repayment failing, the loan defaulting, that security becomes the property of the bank who can then realise its value and regain their money. Land is a commonly used form of security.

- Unsecured loans are rare, attract a higher rate of interest and will be subject to tight controls to ensure repayments are made on time.
- The Interest rate for secured and unsecured loans will depend on a number of factors:
 - a. Security – the more likely the lender is to get at least their capital back the lower the rate of interest.
 - b. Credit rating – the better the record of repaying loans an organisation has the easier it will be to obtain funding and the lower the interest payments will be.
 - c. Economy – the economic conditions in the region, country and globally will influence the ease of obtaining funds and the interest rates to be paid.
 - d. Morals – certain lenders will apply ethical or corporate responsibility filters to prevent funding unacceptable projects or to encourage the funding of desirable projects. Examples of desirable regeneration projects could include social housing, certain types of transport infrastructure or environmentally benign forms of construction.

9.2 Risk capital – time is money

- For higher rates of return, certain investors are willing to accept low or no levels of security. The adage ‘time is money’ is nowhere truer than in the field of risk capital. Capital exists in order to make a return. The longer it takes to make a return the higher that return has to be in order to justify that investment. In a brownfield regeneration context, the longer it takes to determine what is to be done on a site, get permission to do it, do it and then begin to have an income stream (through sales or rentals) the higher the rate of return has to be.
- Public companies operate on an annual cycle of reporting performance and paying shareholders a dividend. In the housing sector it is possible to make capital work

twice through a one year period by going through the cycle of buying land, building and selling the houses twice within a company reporting year. The same amount of capital can therefore generate twice the profit than if only one cycle had been completed.

9.3 Specific brownfield finance

- In most countries specific brownfield finance does not exist – indeed the very term brownfield is neither defined nor understood.

9.4 Structural and Cohesion funding

Brownfields are inherent part of the urban agendas of our cities, however the ability of the new member states to press for urban agendas through regionally focused projects have yet to be proved. This is because Objective 1 priorities (most of the CEC area falls under this) have concentrated on the urban agenda much less than Objective 2. This is why the new member states and their local authorities are so 'new' to urban programmes that may help them address their brownfield issues.

For the CEC in the current run of structural funding, priorities for brownfield remediation do exist, but often they are focused mainly on industrial use or solely on the environmental aspects. However, from the research on type and location of Czech brownfields it is becoming patently obvious that much wider priorities to support brownfield remediation need to be set.

Setting broad and useful priorities related to brownfield reuse should be a challenge to be achieved in the new wave of the structural funding through the individual Operational Programmes. However, to be able to set correct priorities supporting brownfield reuse on national or regional levels, the decision makers have to have at least a sample indication what type of problems they have, (profile of the problems may vary from region to region)

and where it is located. Based on the Czech brownfield research consultants' findings it appears that presently the majority of brownfields are superglues to the local market.

- In its attempt to create a single European market, the EU uses structural funds to try and reduce, if not eliminate, differences between regions in Europe. Regions suffering from de-industrialisation or other forms of economic disadvantage are, for a period of time, eligible for funding to create new infrastructure to kick-start the economy.
- As Europe expands and local economies improve, regions which were once eligible for such funding may cease to be so. The 2004 enlargement for example will result in many of the new member states becoming eligible for such funds while previously eligible regions in older member states will lose that entitlement.
- The EU structural and cohesion funds are the main instruments for supporting social and economic restructuring across the EU. They account for more than one third of the EU budget. They are used to tackle regional disparities and support regional development through actions including:
 - a. developing infrastructure and telecommunications,
 - b. developing human resources and
 - c. supporting research and development.

9.5 National Programs

- Member states have national funds to support national objectives. These could include infrastructure development, provision of social housing and development of health or education facilities. Brownfields in urban areas can offer a degree of flexibility in urban land management that can make them attractive to such national funds.
- State or former state enterprises can leave the public purse with considerable long term liabilities. National funds are then al-

located to manage those liabilities. The Coalfield Regeneration programme of the English Partnerships stems from the liabilities of the former nationalised coal industry in the UK.

9.6 Other international and national funding sources and grants

Competition among local authorities for resources to fix their brownfields - private and public - would be fierce, not only for program funding to rehabilitate sites, but mainly for the investments and activities that must inhabit these sites if the market is to take them up. Only the agile and brownfield-informed regions and local authorities will then be rewarded by being able to access various international grant and aid packages or funding from EU sources, especially Cohesion and Structural funds and also to explore various local grants and funding possibilities.

9.7 Necessity of combining various sources of finance

- Often different types of funding are available for specific purposes only. Private sector funds are usually only available where likely returns on investment can be evaluated. Hybrid project financing is almost certain to be needed.
- Owners may need to invest some of their own funds up-front to develop information allowing third parties to decide if and how much they want to invest or lend to the proposed regeneration project. Even for public sector funding, considerable time and effort is needed to provide the required information to qualify for public funds.

10. Legal and liability aspects of brownfield regeneration (author of the chapter Dr. Paul Nathanail)

10.1 Aim

The aim of this chapter to develop an awareness of the sources of liability for engineers in brownfield regeneration. These include criminal activity, breach of contract, professional negligence and third party liability.

A fundamental principle of business is that you should not expect to get what you have not paid for. Work carried out by an engineer, as for anyone else, needs to be profitable if he is to continue in business and the financial return and risk exposure must be acceptable for any project. Remember however, that the Courts are likely to be unimpressed by an argument that the client ought to expect less than a reasonably professional service because he knew that he was paying less than the market average for the work. Standards must be maintained. If a particular task, including reporting, cannot be professionally and profitably carried out at the fee the client is willing to pay, the engineer should decline the work.

10.2 Criminal liability

Criminal liability arises from an act or omission that results in criminal offence – the law has been broken and you can be prosecuted in a court of law. Examples relevant to the site engineer include breaching health and safety legislation where someone you are responsible for may be injured or killed. For project or contract managers, financial fraud can result both in employers taking disciplinary action and in prosecution where large sums are involved.

10.3 Contractual liability

A contract is no more than a promise or a collection of promises enforceable by the courts. Where a promise has not been kept the innocent party is entitled to claim damages from

the party who has broken the promise. The measure of damages is the sum of money required to put the innocent party into the position he would have been had the breach not occurred. Some breaches are regarded as being so serious that as well as entitling the innocent party to damages they also entitle him to treat the contract as no longer being binding. The courts may also make an award of specific performance, which is an order that the party in breach do what he has agreed to do (AGS Loss Prevention Alert: Contractual Risk Management, www.ags.org.uk).

Effective project risk management requires that the risks be identified and allocated to the person or organisation best suited to accept and manage that risk. Often this will be based on economics. The client may pay more to one of its advisors to take on board a particular risk, or the client may decide to take on the risk himself. It is unfortunately common for the parties to a contract to use the contract to try and pass as much risk as they can to the other party. A more enlightened course would be a collaborative approach to risk reduction for the project as a whole.

Contractual liability results from an act or omission that breaks or contradicts a clause in the contract the engineer is working under. Contracts frequently specify what must be achieved and by when. Some contracts include financial penalties for late delivery which can be very painful.

Although not every error constitutes negligence, claims can arise in the following set of circumstances:

- there is an error in the engineer's report or construction.
- that error amounts to negligence.
- a person relies on the error and suffers loss as a result of the negligence.
- the person committing the error ought fairly and reasonably to have anticipated that the person relying on the report would so rely on it.

10.4 Professional Negligence

Engineers should recognise that they have legal and professional responsibilities to use reasonable skill, care and diligence, either as employees or as employers of appropriately qualified and suitably experienced staff (AGS Loss Prevention Alert: Contractual Risk Management).

Any professional owes a duty of care to his client and the public at large. Failure to act in a manner compatible with that of a competent engineer constitutes professional negligence. Case law will dictate what constitutes negligence in each country.

10.5 Third party liability

Third parties may, in certain circumstances, benefit under contracts to which they are not a party. The third party is able to enforce a contract term if the contract expressly gives him the right to do so, or if the contract purports to confer a benefit on the third party. Contracts should be checked thoroughly for third party rights. It is possible to expressly exclude or modify third party rights by the inclusion of an appropriate contract clause and it is recommended that where possible this be done. Such a clause is "notwithstanding any other provisions of the contract, nothing in this contract confers or purports to confer any right to enforce any of its terms on any person who is not a party to it". There may be specific national legislation given third parties rights – e.g. the UK The Contract (Rights of Third Parties) Act 1999.

10.6 Protecting your own interests

Make sure your client can pay. While negotiating the contract the engineer should attempt to determine the financial stability of any new or current client. Does the client usually pay on time? Sometimes it is better to walk away from a client who always queries an invoice to delay payment, or at least the engineer should add something to account for servicing the debt.

Make sure your contract is valid. Most contracts will be with artificial entities, such as partnerships, companies and local authorities or other public bodies. Such artificial entities can only negotiate via their directors, officers or employees who have authority to negotiate on behalf of the entity and to bind it to a contractual relationship. The question arises, how an engineer can be sure that the person he/she is dealing with has authority to enter into a contract of the type envisaged. The problems that arise can be serious. The engineer might believe that a valid contract has been executed when in fact that is not the case. Although the engineer might have a claim against the apparent agent on the basis that he/she wrongly put themselves forward as having the authority to enter into the contract, the agent (often being a salaried employee) will have insufficient assets to meet any significant claim.

It must be borne in mind that similar problems arise with respect to variations of contract. In strict terms, variations involve the creation of new contracts for which all the ingredients of contracts are necessary such as offer, acceptance, consideration and, when dealing with an artificial entity, the existence of someone who has authority to bind that artificial entity to the agreed variation.

10.7 Accurate Use of Words and Terms

It is important to be accurate in the use of terms or individual words throughout any contract or report. Some words have an industry definition, such as 'clay', and so should not be used except as defined. Similarly 'with some sand' means a specified percentage of sand, and so should only be used as such. Ensure that the report uses the correct words with the correct meaning and in the correct way.

Do not make more of the available data than can be wholly substantiated. For example avoid overstatement. Do not say something is 'very big' when 'big' will suffice; do not say something is essential when in fact it is merely

advantageous; do not say a policy is disastrous when what is meant is that it is undesirable. Avoid wishful statements. For example do not say a given option is the only one where really you mean it is the best one. Do not make more out of limited information from exploratory work than can be justified. Avoid making careless statements, in other words make sure what is written is what is meant. Consider whether a word or phrase can have another meaning just as reasonable as the one intended.

10.8 Calculation Errors

Calculations are used in many aspects of an engineer's work, and any errors can have a significant effect on the information, recommendations and designs presented in a Design Report. If not formally laid out calculations can be difficult to check. The use of computers, either with proprietary software packages or with internally developed spreadsheet programs, has increased the risk of calculations containing errors that go uncorrected. Some types of errors are listed below.

- Misunderstanding data format (e.g. levels presented in Chart Datum being assumed to be Ordnance Datum).
- Basic arithmetic errors (e.g. $2 + 2 = 5$).
- Confusion with units, especially if converting between different systems of units, and when inputting data into a computer program.
- Incorrect material properties, arising from calculation errors in the laboratory or errors in the analysis of the available results.
- Incorrect basis for the calculations. For example assuming a slope failure to be a slip circle when the failure mechanism is controlled by pre-existing shear surfaces.

Appropriate quality assurance measures should be introduced to check and approve calculations. Arithmetic and sense checks should be undertaken by appropriately experienced staff on all calculations that may affect what is written in a report. In some cases du-

plicate calculations by another team or organisation may be justified.

10.9 The role of financial caps

Construction Industry Council. 2004. Liability Briefing, February 2004. Managing liability through financial caps. www.cic.org.uk.

A financial cap on liability in a contract (for example a consultant's appointment) operates to limit the damages payable by the consultant to the client under the appointment to the agreed amount. Under UK Law, liability cannot be excluded or restricted in relation to damages for death or personal injury. Parties to a contract can however agree to limit any other liability that they may incur to each other, e.g. for breach of contract or negligence. This can be done in a variety of ways. One method is to agree a financial cap, beyond which the consultant will not be liable. Recovery from a limited company or limited liability partnership (LLP) is limited to its insurance cover and the assets of the company or LLP; even in the case of an individual or partnership, recovery is in practice similarly limited – no individual or partner has unlimited funds. A cap therefore gives clients as well as consultants a degree of certainty they would not otherwise have.

The scope of the cap depends on the terms of the contract and usually follows one of these options:

- The cap might apply to each and every claim so that each claim could be to the full value of the limit.
- The cap may be applied on an aggregated basis. Here claims would be 'grouped' according to the particular event that caused the loss/damage.
- It might apply as a total limit in which case, regardless of how many claims arose from the event that caused the loss/damage, the consultant's liability would not exceed the figure stated. This option offers the greatest certainty in relation to potential exposure.

Any proposed cap should be drawn to the attention of the other party to the contract. Preferably it should be discussed and specifically agreed. If this is done it is much more difficult for the other party to successfully challenge the cap in court. Where repeat work is undertaken for the same client any cap should be negotiated and agreed for each commission. Records of the discussion as well as any correspondence should be retained, particularly where the other party is not legally represented. It is helpful to include a note of how the cap was calculated.

There is no simple answer or formula on how to calculate a reasonable cap. It is sometimes suggested that a multiple of the fee is appropriate. However, each project has to be looked at on its own merits. A number of factors should be taken into account, for example:

- the likely nature and extent of the risks of the project, having regard to its size, complexity etc.
- an assessment of the damages that would be payable in the event of a claim of negligence (e.g. the cost of repeating the work/construction costs).
- the resources that the consultant could be expected to have available to meet any liability.
- any previous dealings between the parties.
- the amount and cover available to the consultant under his PI policy.

In summary:

This chapter has focused on the various forms of legal liability an engineer may encounter in his professional duties. These may be summarised as:

- Know what you are supposed to do
- Ensure you can do it
- Ensure you are prepared to do it
- Sign the contract
- Do what you are supposed to do
- Prove that you did what you were supposed to do

BOX 6: On Environmental liability in Europe and the US

In the European Union,

There is no legislation directly pointing to brownfields and liability issues. However environmental legislation (Water Framework Directive) includes a zero level policy, so as not give a chance to pollute to an allowable level. The Environmental Liability Directive should come into force in 2006 and brings up the 'polluter pays principle' as the central point of future contamination.

European Environmental Agency (EEA) plays rather a co-ordinative role.

In the UK,

The main guiding principle of site clean up is "suitable for use." Remediation levels are set by a risk-based approach on site by site basis (the amendment, 2000, to the Environmental Protection Act, Environmental Protection Agency, 1990). Predevelopment levels are required only in cases of breach of an environmental license or permit. The polluter pays system applies as far as possible.

The 'enforcing authority' (usually the local government) identifies the party responsible for the remediation action. It is either the user (who caused or knowingly permitted the pollution) or, if such a party can not be found, the owner (lenders and investors are typically excluded). The party must carry out the remediation or it is required to cover the cost of remediation carried out by the authority (there are waivers and reductions for certain cases).

The other authority is the Environmental Agency established under DEFRA (Department for Environment, Food and Rural Affairs), which is also responsible for special sites of significant risk and should issue regulations preventing further pollution.

To promote clean up remediation waste in the UK is free from landfill tax.

In the Netherlands,

The Soil Protection Act is the main statute for contaminated sites. Contamination caused before 1987 is handled by all levels of government, a risk-based approach in a function-oriented manner is used and legal action can be used to recover the costs. Sites contaminated after 1987 must be fully cleaned as soon as possible, allowing various future uses. Here the responsibility falls onto owner-operator-lessee, who can also prove to be innocent (cases of no direct involvement or when they could not have been aware). Primary authorities are local governments. Special cases fall under VROM (Ministry for Housing, Physical Planning and Environment).

To support the redevelopment, pre-1987 clean-up waste is free from tax and in special terms soil with certain level of contamination can be reused for construction.

In Germany,

There are 362,000 suspected contaminated sites. Member states of Germany (e.g. German Federation) took different approaches to liability, assessment and cleaning before the Federal Soil Protection Act (1999) brought in general guidelines and harmonised the disparate approaches to site remediation in different German states and clarified remediation issues against waste issues.

Military bases and formerly state owned mines and factories became, together with their environmental liabilities, the responsibility of the federal government.

The 'polluter pays' principle is applied. Polluters must decontaminate the sites (before 1997 only if proven) to levels based on proposed site use and exposure conditions (different levels of pollutants require different regulatory response).

In the U.S.A.,

In 1980 Congress enacted the „Comprehensive Environmental Response, Compensation and Liability Act“ („CERCLA,“ also known as „Superfund“) to respond to the growing concern over health and environmental risks posed by these abandoned hazardous waste sites, and to clean up these sites. The Superfund program is administered by the U. S. EPA in co-operation with individual states and tribal governments²².

To promote redevelopment, a voluntary clean-up program allows property owners or their designees to voluntarily enter a site into the state regulatory process to complete the clean up of their property. Upon realisation the voluntary party receives a document clarifying the state of the site. End use is considered in all U.S. states but the site-specific approach is applied only in some of them.

There is an 'innocent landowner defence' and federal 'lender liability protection' in the U.S. as opposed to Canada, where even a private person or financial institute providing capital can become liable.

Note: Various sources suggest that liability is a hindrance and relieves would foster redevelopment. "Developers are more responsive to relieves than to subsidies."²³

²²www.epa.gov

²³Social Science Research Network, SSRN-id383481.pdf, Anna Alberini

Except for the notes 1,2 the main source of information was: Final Report of "International Brownfields Redevelopment" prepared by International Economic Development Council, 2005

11. Cultural and social aspects of brownfield redevelopment (author of the chapter Dr. Uwe Ferber)

Learning outcome – "awareness level"

After reading this chapter you will be aware of the following:

- o What the relevant cultural and social aspects of brownfields are
- o How to include these aspects into redevelopment strategies

As well as the economic and environmental aspects of brownfield redevelopment, social and cultural factors also play an important role in the success of a brownfield regeneration project.

In the process of deciding upon a suitable land-use and urban design for a brownfield site it is necessary to consider the local neighbourhood and the potential impacts of the project. This is particularly important as brownfield sites are often historically closely interlinked to their neighbourhood and located in dense urban areas.

The overall aim is to promote a good co-existence of different uses, as well creating an identity and enhancing the image of the city area . The main questions to be answered in this context are: "How do the surrounding neighbourhoods benefit from the intended land-use functions?" and "What burden does the intended land-use function impose on the surrounding neighbourhoods?" A participatory process in which the neighbourhood is involved represents a good means by which to reach sustainability and to encourage the citizens to accept the project.

11.1 Improving Image and Perception

Brownfields often have a negative public image due to their appearance but also because the generation of brownfields is, in most cases, accompanied by the loss of jobs and a rise

in the unemployment rate of the particular urban quarter – including the surrounding neighbourhood. Such a negative image is an obvious hindrance to the development of the brownfield site itself as well as that of the neighbourhood.

The perceptions of outsiders are just as important as those held by the inhabitants. It is a goal of the project team to cultivate a positive image of the regenerated area among those who will be living and working on the land, so that they can develop a sense of neighbourhood and community. As a general rule, a negative image coincides with a bad appearance, decaying buildings and social stigma. A bad image of the neighbourhood can lead to a dip in investors' confidence. An obvious part of the problem is the opposition to redevelopment, for example the anxiety of change.

There are numerous instruments available to deal with these problems: the first measure consists of analysing the existing image of the land and creating a development concept for the urban quarter. The efficient implementation of measures for the land is important, even if these only exist initially for the setting up of information panels.

Key public investments, e.g. through the European Regional Development Fund, could support the change of image.

Interim and soft-end uses of the brownfield, such as green areas, can also be helpful to begin changing the image of the site and its neighbourhood.

All parties involved with the development of the site have to establish trust in the redevelopment process through residents and the local economy. Presentations (i.e., LA 21) and the introduction of an independent intermediary expert can help here.

11.1.1 How to make vacant properties contribute to their environment

Because of the rapid changes in the economy and in any short-term demand for buildings and sites there are many vacant sites in urban areas which provide a derelict image and lower the profile of the area. The challenge is to ensure that vacant areas and buildings do not have a negative impact on their surroundings where blight brought by boarded-up properties could add to a spiral of environmental and social decay. State and local authority property owners and developers should facilitate temporary solutions for large empty sites, unoccupied buildings and vacant shops in parades or town centres where there is no immediate prospect of redevelopment.

Key proposals include:

- Encouraging temporary use of properties or land awaiting redevelopment
- Enhancement of the appearance of abandoned sites and buildings

Finding a temporary use for a vacant site or building can improve its appearance, and can reduce crime and vandalism in the surrounding areas by providing activity and surveillance.



Fig 11.1: Kammgarnspinnerei in Leipzig

A temporary use should:

- Be encouraged for large and small sites, buildings and shops particularly those close to residential areas and town centres to stop the spiralling effect of decay.
- Be appropriate to the location. The aspirations of the local authorities for the final land use should not restrict the opportunity of finding a suitable temporary occupier.
- Not impede later redevelopment. Suitable leases and restrictive covenants should be in place to safeguard the long term future of the property.

11.2 Contributing to Sustainable Quarter and Urban Development

The challenge of brownfield regeneration is to ensure a balance between essential change and the continuity of an established community. With regards to spatial and architectural aspects this can be guaranteed through the preservation of industrial memorials and measures such as landscaping (introduction of green spaces, cycle paths etc). It would be a huge mistake to introduce faceless architecture and urban design into the development plans. A conscious decision is made regarding continuation with the image of the area, as well as a new sense of social identification for the future. Especially important in this is interaction with public spaces. Many real-estate development projects are accused of neglecting public areas in favour of screened-off, private spaces. This can also be considered as being a commercial disadvantage, as many real-estate investors live in close proximity to the area.

Sustainability in this context means defining suitable land-use and urban design that enables social, economic and ecological benefits and synergies both for the site itself and the local neighbourhood and prevents, minimises or compensates adverse impacts.

In particular these targets refer to a participatory planning process that discovers and

integrates the interests, ideas and concerns of the neighbouring population. This also contributes to a high acceptance for the project, which might be crucial for its realisation.

Recommended actions: :

- To analyse the historic and actual meaning of the site for the urban quarter / neighbourhood / surrounding area and use that knowledge in the creation of the project vision
- To try to create benefits and prevent, minimise or compensate for adverse impacts on the neighbourhood
- To analyse and document the economic, environmental, social, cultural and aesthetic impacts of the project on the neighbourhood
- To assess cumulative impacts, provide an assessment of alternatives and consider transboundary issues
- To (try to) derive ideas for urban design and landscaping from the surrounding urban fabric and culture
- To integrate those parts of the neighbourhood, that are most affected by the project into the spatial concept for the brownfield site

Possible benefits and synergies for the neighbourhood that can be generated by a brownfield regeneration projects might be:

- Facilities to improve health and recreation (e.g. land use that causes only little traffic, low-emitting enterprises, access to community health clinics, green areas for a range of uses)
- Sports facilities (e.g. sports fields, fitness centre, horse/bike/hiking trails)
- Short distances to supply goods and services and access to the countryside
- Leisure and entertainment (e.g. restaurants, pubs, cinemas)
- Educational and social infrastructure (e.g. schools, nurseries, youth centres, sports clubs)

- Family- and child-friendly environment (e.g. small streets, land use that causes only little traffic, traffic calming measures, social infrastructure, playgrounds, green areas)
- Increase of property values
- Security, reduced crime (e.g. street lighting, anti-social behaviour orders, avoiding dark spaces)
- Identity (e.g. preserving and reusing historical buildings, use of local languages/religion)
- Increased number of inhabitants (as a synergy effect for neighbouring uses like commercial or industrial areas, housing demand)

In terms of possible adverse impacts the following should be considered:

- Noise / vibration
- Traffic
- Services supply interruption (water supply, electricity...)
- Dust
- Fumes (health issue)
- Potential contamination/ transportation of contaminants
- Smell
- Aesthetics/perceived visual pollution
- Damage to the natural environment
- Blighting effect (i.e. perception of devaluation of buildings due to new infrastructures)
- Decrease in property values
- Increase of rents / social displacement
- New competitors for existing companies

11.3 Accessibility

A main aim is to develop brownfields so that they are in physical harmony with their immediate surroundings. This includes the creation of connections, the breaking down of existing barriers and the space-time integrated development for various modes of transport.

Numerous industrial brownfield sites are situated in basically advantageous locations in inner urban city districts. Nevertheless, in many

cases, new transport infrastructures are considered mainly for motorised means of transport as they are regarded as important economic location factors. In fact, the economic success of regenerated brownfield sites often depends essentially on the interest of investors in the accessibility of the sites for local, regional and national motorised transportation systems (distance to highways and motorways, to airports, etc.), for the supply and distribution of goods as well as for the accessibility for customers and staff. But to provide accessibility in a sustainable way, the site should be adequately accessible for all population groups and all means of transport according to the specific local conditions.

Accessibility is mainly a social objective as it encourages not only the main mobile part of the population but particularly disabled persons to make use of the site. The objective has also economic benefits. Opening the site for all population groups improves the chances to market the site and creates synergies between different uses by attracting as many potential consumers as possible. Finally, there can be great benefits for the environment. A sustainable reorientation of transport is needed to lower the trend of the one-sided situation of car mobility and to increase an ecological means of transport. Accessibility in this context can support this general objective.

As inner-urban brownfield sites were often 'forbidden land' and not accessible to the public, they have been perceived, for a long time, as barriers between urban districts. This situation of separated districts poses obstacles for the accessibility of destinations in the neighbourhood as well as the urban design and the whole townscape. To solve these problems and to overcome these limits connecting surrounding districts of former brownfield sites becomes an important sustainability objective for land-use and urban design. The former brownfield sites should be integrated as links and corridors, in order to connect the districts

and to make the site accessible to the public. To meet the demand for these connections, a thorough analysis of possible destinations and sources in the surrounding areas is needed.

11.3.1 How to create sustainable new communities?

New neighbourhoods should be planned and built on brownfield sites. The challenge is to create neighbourhoods that will encourage the development of strong and diverse communities and that will establish a positive relationship with existing areas, which are often in need of improvement.

The master plans for new residential developments can influence the development of a strong local identity and provide a public realm that encourages social life and responds to the needs and requirements of local people.

The key principles for fostering thriving new communities are:

- New neighbourhoods have a local centre within walking distance.
- There is variety of uses and users.
- The street layout encourages walking and cycling.
- A variety of open space is integrated into the life of the neighbourhood.
- Services and infrastructure are sustainable and allow for growth.

Sustainable neighbourhoods should not only have an active mixed-use centre, but should also attract a variety of people, with different family structures and living requirements:

- Home/work accommodation should be available in the denser parts of the site and close to public transport.
- A variety of building types, sizes and densities should be offered, with denser areas close to the centres and to public transport. Not more than 50% of the dwellings should be of the same type.
- In any area, tenure should be mixed to reflect the diverse needs of existing and

future households. The financial and maintenance difficulties of mixed tenure buildings can be overcome by early planning and common management structures.

Public open space should be an integral part of the landscape structures of the new neighbourhood, and could include areas of ecological importance (existing or created), green corridors and waterways, street planting, parks, allotments, playing fields and landscaped or paved urban squares. Public open space will have a significant role in the life of the neighbourhood if:

- Open spaces are parts of networks, rather than isolated landscape features. Spaces for recreation should be linked with continuous pedestrian and cycle facilities and landscaped corridors provided to support wildlife.
- The layout of the development is planned so that the main frontages are directed onto the open space creating activity and increasing security and amenity. Areas at risk of crime, such as car parks, should not be located near public parks without adequate security provision.
- The spaces and neighbouring buildings provide activities for people at different times of the day such as play areas, cafes, pubs, shops and civic buildings. Some spaces could be multi-purpose and could be used by schools and community groups at certain times of the day.
- The main landscape areas are located along key pedestrian and cycle routes, rather than cut off from daily pedestrian traffic.
- Existing features like the riverfront, canals, interesting buildings, views and the proximity to public transport are exploited for the location of open space.
- Microclimatic conditions (sunlight and wind) are favourable for the proposed use of the landscape.

Intensification and diversity of building types and land uses can increase the quality and appeal of living in existing residential areas as in the Thames Gateway, London. The components of a successful approach are:

- Bringing back into use derelict and under-used buildings or plots of land, and exploiting the opportunities of infill or selective redevelopments in order to add diversity to the building stock.
- Introduction of a variety of housing types, living and work accommodation and mixed use buildings, particularly close to centres and transport nodes.
- Increasing the number and quality of dwellings in locations where existing densities cannot support local shops and facilities. Opportunities will occur only in specific locations close to centres and public transport.
- Resizing and refurbishing existing dwellings to make them suitable to new housing needs. This could involve the merger of smaller flats into larger ones, the subdivision of large homes into flats, the reorganisation of the internal distribution to provide flexible rooms or improved bathrooms.
- Diversification and mixing of housing tenures within existing residential areas, to widen social and age structure and nourish stable communities.

11.4 Identification

Independent of the end use of the brownfield, the aim of developing sustainable quarters with a higher quality of life is of the utmost importance. In the past the question of the neighbourhoods where people live, work and spend their free time demanded too little attention.

One of the core elements of high value urban development is a good connection to open space. The design of these public spaces with good quality pedestrian, cycle and public transport, as well as a good sense of place (*genius loci*) is vital.



Fig.11.2, 11.3: "Reserve-sites" in Chemnitz. Case example for green space creation

The key to securing quality urban redevelopment is a good planning process, inasmuch as they will be accomplished through competent planners and community representatives. Innovative, co-operative planning processes and methods (proposal workshops etc) where all of the relevant actors are involved and the necessary resources are available can be successful for the realisation of quality.

11.4.1 History

Many of the 'changing places' sites have had a time as the 'engines' that fuelled the industrial revolution – coal mines, quarries and canal sides. With the decline of heavy industry these often massive areas became derelict or abandoned. Many were used informally as playgrounds and recreation areas, but they were largely left to deteriorate until they became neglected and sometimes dangerous eyesores. Changing places have found a new

meaning and purpose for these once significant places. However, it has also made new and meaningful connections for the people who live and work nearby.

Rather than looking back and being reminded of the problems that led to the decline of local industry and local neighbourhoods, people are rediscovering a fierce pride in their area and celebrating the distinctiveness of its past and present. The older generation may remember those original industries and the part they played in them. Young people are discovering the history of their area for the first time, getting involved in decisions that affect their future and gaining a new respect for the place where they live.

Questions to facilitate further learning that will help you to reach the learning level of “understanding”

- *What are the main social and cultural issues connected to brownfield redevelopment?*
- *What are the possible benefits and synergies for the neighbourhood generated by a brownfield regeneration projects?*
- *What are the possible options and factors of successful brownfield regeneration projects?*

12. Brownfield redevelopment and citizen participation (author of the chapter Dr. Uwe Ferber)

Learning outcome – “awareness level”

After reading this chapter you will be aware of the following:

- o The role and importance of citizen participation in brownfield regeneration.
- o The best practice examples.
- o How to organise citizen participation and stakeholder involvement.

Citizen participation in decision making is not only a democratic value in itself, moreover it can contribute to the quality and success of brownfield regeneration projects both in terms of short-term project goals and long term sustainability of projects. For a number of reasons it has a particular relevance and importance for brownfield regeneration projects:

- Major industrial restructuring frequently leads not only to abandoned and damaged land, but also to abandoned and damaged communities. The processes of finding a new future and a new identity, for both the site and for local people, must go hand in hand if regeneration is to be meaningful and truly sustainable.
- Brownfields are frequently located in inner city areas or in urban areas where people live. The impact of brownfield redevelopment can greatly affect those who live or work nearby. These people are therefore key stakeholders and should be engaged in developing regeneration strategies.
- The views of local communities can have a strong impact on the development process in terms of possible opposition, contributing local perspectives to regeneration solutions and of finding a ‘win-win’ solution.
- Brownfields are commonly associated with issues of contamination (real or perceived) and the associated risk to public health. Therefore local people will have a particular

interest in the proper management of this risk.

- Brownfield regeneration presents a major opportunity for contributing to the imperative of sustainable development. One of the central tenets of sustainable development is putting local people at the heart of decision-making. Recent reviews of successful projects have shown that brownfield regeneration that fails to adequately engage with local people is not sustainable brownfield regeneration and carries a much greater risk of failure²⁴.

Principal documents for citizen participation are:

Aarhus Convention - UN/ECE Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters – signed on 25 June 1998 by Ministers from 35 European countries and European Union in the town of Aarhus, Denmark. The European Convention on Human Rights is now known as the Aarhus Convention.

EC Directive 35/2003 of 26 May 2003 providing for public participation in respect to the drawing-up of certain plans and programmes relating to the environment was adopted in order to contribute to the implementation of the obligations arising under the Aarhus Convention, in particular by providing for public participation in respect to the drawing-up of certain plans and programmes relating to the environment, addressed to the Member States.

²⁴ Office of Deputy Prime Minister, BURA, London (2002): Learning from Experience. The BURA Guide to Achieving Effective and Lasting Regeneration.

Mainstreaming sustainable regeneration – a call to action. UK Sustainable Development Commission. December 2003.
www.sd-commission.gov.uk

The Aarhus Convention provides the framework for good practice by providing the basic procedure for public participation and specifying the types of decisions to which it should apply. Public participation in making decisions is vital. It brings benefits to making individual decisions and also, more generally, for democracy itself. It uses the knowledge, skills and enthusiasm of the public to help make the decision and recognises that the public has a significant role to play.

The objective of the Aarhus Convention is to support the responsibility and transparency of decision-making processes at all levels as well as to strengthen public participation in environmental and social decision-making.

There are three pillars to support public participation and transparent decision-making:

- The access and right of the public to obtain information on the environment.
- The right to participate in decisions that affect the environment.
- The right to justice in environmental matters.

Principles of citizen participation in decision making according to key documents – Aarhus Convention and the EC Directive 35/2003:

OPENNESS – presented as the ability of institutions to communicate their decisions in an accessible and understandable language.

PARTICIPATION – which should stretch over the whole policy chain from conception to implementation and is considered a way to secure confidence.

ACCOUNTABILITY – with the emphasis on a clear definition of roles and the taking of responsibility.

MINIMUM STANDARDS – though not legally-binding, move one step further in the direction of structuring a hands-on approach to managing consultation:

CLEAR CONTENT – all communications should

be clear and concise, and should include all necessary information to facilitate responses.

TARGET GROUPS – relevant parties should have an opportunity to express their opinions.

PUBLICATION – the Commission should ensure adequate awareness-raising publicity and adapt communication to all target audiences. Without excluding other tools, open public consultations should be published on the Internet.

TIME LIMITS FOR PARTICIPATION - at least 8 weeks should be allowed for reception of responses to written public consultations and 20 working days notice for meetings.

ACKNOWLEDGEMENT AND FEEDBACK - results of open public consultations should be displayed on websites linked to a single access point on the Internet.

Citizen participation in brownfield regeneration should target to go beyond the legal standards of formal planning procedures and to understand it as “a systematic attempt to involve the citizen in the design, planning decision, implementation and evaluation of brownfield regeneration projects to ensure their social acceptability.” (RESCUE 2004-II).

On the basis of this definition the RESCUE-project has developed the following set of objectives for sustainable citizen participation in the decision-making of brownfield regeneration projects:

- To obtain a better quality of the information itself.
- To obtain a better quality of the information flow in the decision-making process and a more efficient use of information.
- To have a fairer discussion process and a better resolution of conflicts.
- To increase the legitimacy of the decision-making process.
- To improve the efficiency of the process in terms of duration and costs.

- To empower citizens, especially those representing non-organised interests.
- To delegate responsibility to lower decision levels and to stimulate a sense of ownership.

Best-Practice in Citizen Involvement – the **ECOREGEN Project**: The ‘ecoregen’ approach to land restoration is therefore based on two guiding principles:

- Local people should be fully involved in the whole process of creating new uses for those places in their neighbourhood which have become derelict.
- Nature is often the best and most cost-effective “healer” of derelict land and this potential should be recognised and harnessed to maximum effect.

These guiding principles are regarded as being absolutely complementary to developments of any type, whether these be open natural green space or newly built environments.

The ‘ecoregen’ approach seeks to use the natural potential of sites to deliver facilities which meet the needs of the local community. It aims to create sustainable environments suitable for human enjoyment in a way that nurtures natural processes and respects the value of both natural and man-made heritage within derelict sites.

Questions to facilitate further learning that will help you to reach the learning level of “understanding”

- *What are the main documents and principles of citizen participation?*
- *What is the approach of the RESCUE and ECOREGEN projects?*

BOX 7: How to organize a stakeholder platform

The problem of brownfield regeneration touches upon a broad spectrum of organisations and individuals who all understand expertly certain facets of the whole issue. They

are all presented with individual difficulties that hamper their intention for an effective brownfield revitalisation process. Often such difficulties cannot be solved by those who experience them but, on the other hand, they are not actually experienced by those who can solve them. This is why there is a need for communication and participation that can utilise such individual experiences and connect them to those who are in position to deliver the required changes that can remove such problems. This process often also needs to be accompanied by a further and deeper research connecting and touching upon the spectrum of other expertise. Such research or its results may be too expensive or inaccessible to individuals or single organisations. They may, however, be much more accessible to them should they be in ownership of a broader platform of which they are members. Synergies arising from such co-operation are then shared not only by the members but also by the society as whole. In this case such synergies would be geared directly to reducing barriers to brownfield reuse, thus encouraging their revitalisation uptake.

Stakeholders' platforms at a local or regional or even national level could be created and supported by the various stakeholders who are parties to the brownfield revitalization process. However to create such a platform, an initiative needs to come from a promoting organization, government or private, who has the foresight to realize the full benefits of such an action. The main stakeholders would be mainly the problem holders, developers, various consultants, financing institutions, contractors, regulators, state, regional or local administration, development agencies and others. Individually they all have to cope with the various risks attached to the brownfield revitalization process and by trying to do so, they have to cope with insufficient or inflexible legal frameworks and battle on with low or non-existent cross-sectoral and cross-professional cooperation.

How it could happen

The promoter would contact selected stakeholders to form a preparation committee. Planning to set up such a platform the preparation committee prepares an outline of the new platform activities and enables production of the required documents leading to the registration of the new body as a legal non-profit entity. Such an organization could be governed by a board where the top representatives of the main stakeholders should be represented. It is at this board level that the main benefits may germinate, as such a board that would offer a broader understanding and experience of the brownfields issues from leaders or strategic leaders of different stakeholders organizations. At the board level informal discussions would assist to clarify possible approaches to more horizontal solutions. The board would set the strategic tasks for the organization and would outline the direction in which it should be going. The management of the new organization would deliver tasks as set by the board. One of the main task of the NGO management would be to obtain sufficient outside funding (through membership, project, services) to enable the organization to function as a learned and expert body.

Other tasks of such an organization should be:

- Promotion of the issue at a national level and to search for new and more effective solutions.
- Concentration of know-how.
- Collection of data and suitable indicators.
- Creation of an expert consultative and referential source accessible by other stakeholders and also by public.
- Legal changes proposals and lobbying for suitable amendments of legal framework.
- Participation on committees working on brownfields or related issues.
- Contacting international expertise.
- Co-operation on national and international projects.

What is needed for the implementation?

- Identify suitable stakeholders and set up the initial founding meeting at the highest strategic level.
- Appoint a preparation committee and set responsibilities for registration of the new body .
- Prepare articles agreement or similar such documents explaining the aims, tasks and rules of the organisation.
- After registration call a general meeting, elect the board, set the tasks and appoint management.

Questions to facilitate further learning that will help you to reach the learning level of "understanding"

- *What are the main documents and principles of citizen participation?*
- *What is the approach of the RESCUE and ECOREGEN projects ?*

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Education and Culture

Leonardo da Vinci