Urban Brownfields in Europe

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Across Europe, the presence of derelict land is a subject of concern. Brownfield sites present particular challenges to national and regional policy makers in terms of bringing the land back into beneficial use and of cleaning up contaminated soil and groundwater. In this respect successful brownfield redevelopment policies and strategies need a combination of environmental and spatial and urban planning approaches. To provide such a link, a specific Working Group 1 on urban brownfields has been set up within the wider CLARINET project. This paper outlines the major findings on the extent of the brownfield problem across Europe as identified by this working group. It summarises available information on brownfield issues in European countries and introduces the work of the working group. Since Working Group 1 is still ongoing, final conclusions must wait until the final report of the group, due to be released in summer 2001.

Key words: brownfield redevelopment, derelict land

INTRODUCTION

Brownfield redevelopment is widely acknowledged as one of the major tools to achieve development which is sustainable. Because the main reason for the emergence of derelict land is economic structural change and the decline of traditional industries, derelict land is frequently coupled with a severe loss of jobs and, as a direct consequence, the decline of the neighbourhoods around derelict sites or even of whole cities. In addition, it is commonly recognised and documented (e.g. OECD 1998) that the presence of derelict land has adverse effects not only on the environment but also on the economic and social health of a city. It is further commonly understood by both planners and policy makers that future urban development has to happen on derelict land. However, despite understanding the need for such action, this is not current practice in many industrialised countries. In Germany alone, for example, an estimated 129 hectares of greenfield land is lost per day for building purposes. Urban sprawl and the spatial separation of different land uses are ongoing and lead to an increasing need for mobility of the public. Taking into account the ongoing consumption of open space for housing, retailing and industry, it must be recognised that a sustainable built environment cannot be achieved without reintegrating brownfield land into the property markets and shifting development back to central urban locations.

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BROWNFIELDS IN EUROPE

The process of industrial change has resulted in the creation of so-called ‘brownfields’ across Europe, particularly in urban areas. These sites present particular challenges to national and regional policymakers, including the remediation of hazards to human beings, groundwater and ecosystems. But there is also a need to facilitate the reintegration of rehabilitated sites into the property market and to ensure that they can be brought back into new economic uses. In this context, it can be seen that the three disciplines of environmental restoration, land-use planning and economic policy are all involved in the process of brownfield redevelopment.

Quantifying the scale of the brownfield problem over Europe is difficult. Most European countries cannot provide estimates on the size of problem in their areas. Even where countries can provide figures – for example Germany (about 128 000 hectares), The Netherlands (between 9000 and 11 000 hectares), Belgium/ Wallonia (about 9000 hectares) – it is clear that the data are not directly comparable, and include different kinds of site. This reflects the lack of a common definition across Europe of the concept of ‘brownfield’, and also the fact that the concept is not legally defined in any of

the European countries. In general, the legal frameworks used for dealing with brownfields are the general 'contaminated land' regimes, although these do not really cover the particular complexities of brownfield redevelopment. Nevertheless, in almost all European countries, brownfield problems are identified as serious problems that need some political and methodological solution.

Historical description

Over the past decades the 'Brownfields' issue was a particular topic of discussion in the traditional industrial regions of Europe. Countries such as the UK, France, Germany and Belgium are particularly affected by derelict land. Also most European cities are affected. Although the underlying conditions are different, there are derelict industrial sites in the traditional industrial centres and in metropolitan cities like London and Barcelona, as well as in peripheral locations such as the Brandenburg lignite fields. This wide range of different circumstances and conditions means that different strategies and programmes will probably be needed to support redevelopment.

Three main categories of brownfield sites have been identified:

1. Brownfields in traditional industrial areas

The massive decline in industrial jobs in the coal, steel and textile industries, at the beginning of the 1980s, created a need for wider structural change in industry. The particular characteristics of these regions had significant impacts on the need for, and the nature of, these strategies. Owing to the predominance of coal and steel industries, the sites involved are often very large. They also tend to have low land values, but require extensive rehabilitation and decontamination work, with considerable costs. In many of the regions, these problems are exacerbated by problems of regional economic disadvantage, making government intervention indispensable, as it could not be expected that the property market itself would solve the underlying environmental, social and economic problems.

2. Brownfields in metropolitan areas

The structurally strong metropolitan areas in the European Union are characterised by a dynamic land market, boosted in particular by the growing service sector. Industrial uses dating back to the 19th century are subject to a persisting displacement pressure and have been moved to peripheral areas during the urban sprawl process. In addition, there are the sites previously used for large-scale railway and harbour infrastructure facilities. These problems, in terms of pressures creating potentially derelict areas, have been reinforced by speculative land banking. The effect of these factors, along with problems relating to conflicts affecting the interest, use and ownership of the sites, has been a generally large extent of derelict land in urban areas. Thus 'brownfields' have been identified in cities such as London, Paris or Vienna, where post-industrial sites would not be expected to be found. The strategies used by cities to deal with these sites mainly focus on using the classical instruments of urban planning. Large-scale projects are pushed by architectural competitions, master plans and investor planning. Problems which are particularly related to derelict land, i.e. land for building, provision of site infrastructure and contaminated soil, are often inadequately considered and lead to considerable friction and losses for individual projects, and even to complete project failure in some cases. This means that 'brownfields' in metropolitan areas are less attractive for investors, and are therefore insufficiently used, even though the general economic situation of the areas suggests that they could be used. As a consequence, 'intermediate uses' and the existence of derelict areas have become a serious problem for urban development in the cities concerned.

3. Brownfields in rural areas

Rural areas within the EU also contain individual derelict sites of a locally limited dimension, that may be very significant for the relevant local government authorities concerned. In the past few decades, the sites which were mainly connected with primary economic activities in agriculture, forestry or mining, have been undergoing a consolidation process resulting in the abandonment of many sites. The local authorities affected by this process are often unable to solve the problems involved and so do not develop any area revitalisation activities. The necessity to develop strategies and programmes is often not recognised at regional and national levels. This means that these areas are simply left as they are, although funding from the European Regional Development Fund has enabled authorities to develop individual projects.

Strategies and programmes

Governments in the traditional industrial regions of industrialised countries like the United Kingdom, France (Lorraine, Nord-Pas-de-Calais), Germany (Nordrhein-Westphalia) and Belgium have created comprehensive strategies and programmes for derelict land reclamation and economic revitalisation.

Since the beginning of the 1980s, initiatives have been particularly developed in the UK, France and Germany, which favour a regional derelict land policy and create specific derelict land recycling programmes. These initiatives were triggered on the one hand by increasing awareness of the negative economic and ecological effects of the derelict sites and on the other

by the recognition of the positive development potential for such sites. Regional, national and European funding was provided to initiate derelict land recycling programmes in traditionally industrial areas – projects effectively being funded by the taxpayer. As it was clear from the beginning that immense financial means would be required for a long period of time to overcome the scale of the problems, funds had to be concentrated on 'pump-priming' initiatives, which would have the effect of promoting subsequent private sector investment.

Special programmes were started because:

- the tasks required in terms of urban development, structural policy and environmental policy were very complex and required a cross-sectoral approach;
- it was evident that the existing actors would have huge problems in taking forward the management and implementation of projects; this applied in particular to the municipal administrations affected. On their own, municipalities would never have been able to handle such immensely large derelict sites, due to insufficient personnel and funding, competition between municipalities and inadequate negotiating power towards the land owners;
- there were tightening 'natural' limits on the possibility of using greenfield sites for new industrial developments, reflecting the increasing importance of the need to protect undeveloped land and, in many regions, the growing scarcity of available land.

Many of the special programmes include key objectives related to structural policy, spatial and urban planning and environmental restoration, such as:

- restricting 'land-take' by greenfield site development by reusing brownfields;
- functional and design improvement of the affected urban structures by eliminating the derelict sites and associated measures aimed at general urban renewal;
- preserving the architectural heritage of the industrial revolution by finding new uses for historic industrial buildings;
- increasing the skills of unemployed people, for example, via the creation of employment opportunities;
- improving environmental quality, for example by encapsulating or removing contaminated soil and restoring the landscape damaged by industrial use.

A closer look at individual projects shows that in practice different regional strategies exist:

- In Northern France, for instance, the priority was to remove derelict sites in order to restore an attractive outer appearance to the region and thus attract private investors for newly developed industrial 'greenfield' sites. In this context, any reuse of the recycled areas and remediation of contaminated land was coincidental.
- Ecological rehabilitation has been a successful theme for the Ruhr area. Here ecological damage is remedied by combining ecological priorities with economic objectives. The aim was to develop environmentally friendly industry and to mobilise areas which can be reused by industry. Thus the 'necessity' resulting from the discovery of extensive contamination on the areas bought up by the land fund was turned into a 'virtue', although the rehabilitation of these areas had not been formulated as an aim when the land fund was set up.
- Classical objectives of economic promotion – establishment of business and industrial parks, provision of new housing, and job creation – are at the centre of UK government policy. Funding has been largely focused on the renewal of inner-city industrial sites, initially with a preference for industrial reuse, but more recently with an increased focus on housing developments.

To summarise, while structural policy aims are still dominant in all programmes, ecological objectives have gained in importance, for the different reasons described above. Special programmes are becoming more differentiated and increasingly account for the interactions taking place in the 'derelict land recycling' issue.

SCOPE OF CLARINET WORKING GROUP 1

A growing awareness of the brownfield situation across European countries as described above provided the impetus for setting up a specific working group on brownfield issues – Working Group 1 – within the wider CLARINET project. The provision of a link between, on the one hand, contaminated land issues and, on the other, spatial and urban development issues was one of the core objectives of this working group. The focus of work carried out has been on the evaluation of best practice approaches in brownfield redevelopment across Europe, and the identification of research and development needs. At the same time, the working group has also attempted to identify tools that are already available that may help to overcome current obstacles to the effective and efficient redevelopment of brownfield sites.

In this context, the major task of Working Group 1 has been the examination of national and regional concepts and requirements regarding environmental, economic and planning permission issues and procedures as part of the redevelopment and soil remediation process. Country reports on national outline conditions and specific technical aspects, as well as case studies have been compiled as a result of two questionnaires. These will be documented and published within the final report of the working group. An essential step towards defining the various dimensions of the brownfield problem was to agree a definition of the term 'brownfield'. As noted above, this term has been used in different contexts and countries to mean many different things. For the purposes of its own work, Working Group 1 has agreed on the following approach, which is intended to describe the full context of the environmental, economic and planning issues that are involved:

Brownfield sites:
- have been affected by the former uses of the site and surrounding land;
- are derelict or underused;
- have real or perceived contamination problems;
- are mainly or partly in developed urban areas;
- require intervention to bring them back to beneficial use.

Although there are significant differences in the approaches adopted in the different countries participating in CLARINET, the analyses carried out by Working Group 1 suggest that there are common factors underlying the potential success or failure of brownfield projects. These are shown below (Figure 1):

- site preparation;
- future use;
- economic viability;
- legal framework.

These factors interact and cannot be treated in isolation of each other; they need to be managed and co-ordinated within the overall process for management of any project. A three-dimensional graphical model to illustrate the inter-relationship between these factors has been developed as part of a research and development project in Germany; the working group considered this model a useful tool for visualising the dynamics of individual projects. This three-dimensional 'tetrahedron model' is illustrated in Figure 2.

Each of the four 'corners' of a tetrahedron stands with every other point in direct and equivalent connection. The lengths of each 'side' and the surface areas of each face are the same. This makes the tetrahedron particularly suitable for representing the relationships and the interdependencies of four factors which are equally important and which directly connect with each other. It illustrates the complex conceptual nature of brownfield redevelopment, which combines a multiplicity of tasks with a multiplicity of actors and disciplines that must co-operate successfully.

Evaluation of many projects provides clear evidence that success and failure is mostly a result of a lack of appropriate balance between the four identified factors, reflecting the principles of this model.

The tetrahedron model, and the underlying factors, provide a conceptual framework for considering the likely success or failure of projects. In practice, the lack of tools for practical implementation of redevelopment projects is a bigger obstacle. Identifying the main needs in terms of research and development for the development of practical tools to encourage and enhance brownfield redevelopment on the European level will be the focus of the working group in the remaining stages of the CLARINET project.

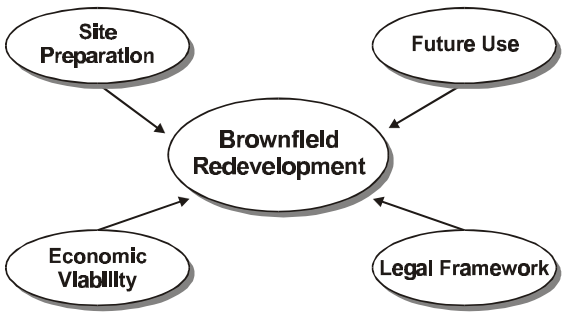

Figure 1. Influencing factors for brownfield redevelopment

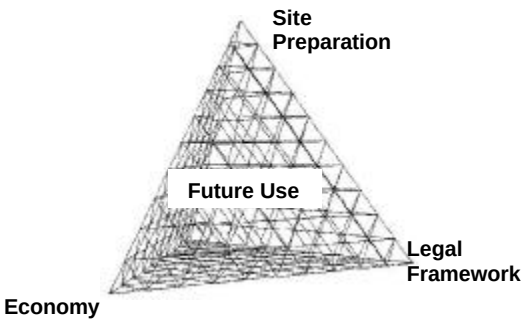

Figure 2. The tetrahedron model

The working group members have already set up and agreed a first 'long list' of principal needs for research and development. This list encompasses proposed activities and decision tools regarding:

- policy and brownfield redevelopment programmes (linkages to issues of 'sustainability', legal and funding conditions, availability of databases of derelict land, etc.);
- activities on the technical level (reuse of existing buildings and infrastructures, reduction of raw material use, contamination management on site, etc.);
- planning activities (urban planning and urban design, public involvement, etc.);

as well as

- economically related activities (approaches for the calculation of economic viability and insurance perspectives).

As a particular task, Working Group 1 has discussed an existing tool that has been developed in Germany. The checklist described in the next section was designed as a tool for project management enabling a comprehensive analysis of the project during its execution. The specific aim is that applying the checklist will enable the user to become aware of the complexity of any brownfield project and obtain an overview of all relevant issues. Deficiencies in planning and implementation can be identified and then counteracted by the recommendations given.

Working Group 1 has reviewed the checklist and adapted it to reflect wider European issues. Initial checks on the validity of the tool in some participant countries showed that the checklist does pose the right principal questions and should be applicable for the purpose for which it was designed.

CHECKLIST 'LAND RECYCLING'

Structure of the checklist

The checklist consists of the following elements:

- an introduction including a legend and procedural instructions;
- sets of questions designed to generate general project data as well as information on factors of influence/fields of action;
- a list of questions concerning defined elements of a comprehensive economic viability analysis;
- an evaluation matrix which allows a direct evaluation of the answers given to these questions.

The general data are intended to enable the user to categorise the project and to allocate it to one of five project phases. Comparisons of land recycling projects show that each project goes through specific phases which are effectively the same for all projects irrespective of their type and scope. The process starts with the preparation and planning, continues with execution or implementation and ends with the result of the project, i.e. its completion. In the case of complex projects all sub-projects may have to be run through these stages, while the stages of the various sub-projects may not necessarily coincide. As a result, the developer or project manager may have to handle many different stages at the same time and to co-ordinate the results of this work for consideration in the overall evaluation.

The categorisation and differentiation of projects to be evaluated through the checklist is based on the following main project phases:

- initiation/orientation;
- planning and development;
- obtaining consent under building legislation/regulation;
- execution/implementation;
- completion of project.

For each of these phases or milestones, a separate evaluation matrix is annexed to the checklist.

The questions included in the checklist address the elements of key fields of action in the area of land recycling. They are based on the findings obtained in project evaluations carried out as part of the original German research project as well as on the recommendations which have been derived from them.

The questions reflect the common procedural patterns identified in the research project for land recycling projects, in combination with the recommendations given on how to optimise the process. This ensures that the checklist's 66 questions cover all central issues of a typical project.

Data evaluation

The evaluation of the data generated through the checklist takes place in phases. An evaluation 'mask' which varies according to the project phase, as defined above, is used to identify both the optimal status as well as existing or emerging deficiencies of the project concerned. The user readily obtains an overview of the strengths and weaknesses of a project and can quickly determine whether the progress made meets the minimum requirement for the project phase in question.

Guidance on the completion of the checklist and data evaluation

The checklist is filled out like a normal questionnaire.

For each question, there are six possible responses (yes – no – in preparation – not necessary – not possible – not known). Upon completion of the checklist the responses are copied into the 'evaluation matrix' table.

To enable the evaluation of the answers, an appropriate evaluation 'mask' is placed on top of the evaluation matrix; five separate 'masks' have been prepared, corresponding to the phase reached in the project to be evaluated (initiation phase – planning phase – permitting under building law – implementation – completion).

In the evaluation 'masks', all responses to the checklist are evaluated by way of a colour code, with five evaluation categories: green (optimal status), light green (non-critical status), yellow (neutral assessment), light red (critical status) and red (unacceptable status).

This evaluation system gives a qualitative evaluation of the status of a given project. The evaluation 'mask' enables the user to directly recognise whether the actual project management status in the relevant project phase and the various fields of action is optimal or possibly critical. If a response is shown to fall within the critical or unacceptable range, the user can consult the catalogue of recommendations in which the steps necessary to attain an optimal work status are mapped out for each field of action covered by the checklist.

CONCLUSION

Brownfield sites have become a persistent problem across Europe which cannot be alleviated by the normal process of modernising the built environment of cities. Thousands of sites which are contaminated, and many previously developed sites in cities with little or no risk of contamination which have either been abandoned or are no longer being maintained, can be restored to improve the environment and to attract new investment for jobs, housing or public facilities. Brownfield redevelopment can assist in achieving the objective of integrated and sustainable land management.

To promote the redevelopment of brownfields, some European governments have developed focused regeneration policies which have contributed to the redevelopment of significant numbers of brownfield sites and invested public monies into complementary remediation and regeneration strategies. However, the need for future action at all levels of government for the task of brownfield redevelopment is still obvious. There are still obstacles for the reuse of former industrial sites, such as:

- the contradictory practice of permitting greenfield development whilst attempting to redress the serious environmental, economic and social problems associated with urban brownfields;
- the inflexibility of policy and legislation which inhibits the redevelopment of brownfield sites; and
- insufficient information concerning the number and size of brownfields and of previously developed but now vacant buildings and sites in cities, and about the economic, social and environmental outcomes of redevelopment.

However, the positive outcomes of the redevelopment of brownfield sites include:

- remediation of many thousands of sites;
- the physical, social and economic regeneration of cities and regions;
- significant levels of private sector investment; and
- dynamic partnerships within cities.

REFERENCE

OECD (1998) *www.oecd.org//tds/bis/brownfields.htm*