

Tailored Improvement of Brownfield Regeneration

Status
quo
and
background

Brownfield regeneration is essential for sustainable land management. Currently, the success in brownfield regeneration is unsatisfying in terms of financial and eco-efficiency or social acceptance. Many useful and innovative technologies for site clean-up as well as methods to support decision making processes exist, but they are only rarely applied using their entire potential.

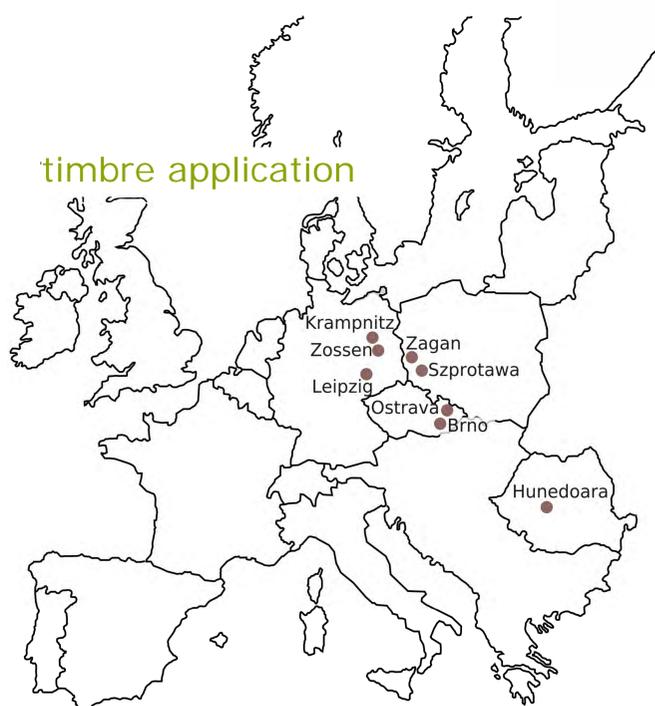
Sometimes the non-visibility of tools is the reason that problem owners, managers, local authorities and other stakeholders do not regenerate brownfields using the best available technology and decision support systems measure. Additionally, emerging challenges, such as the urgent demand for soil remediation and the reuse of on-site infrastructures, call for the development of new and integrated solutions.

Objective

The research project TIMBRE in the 7th EU Research Framework Programme aims at overcoming existing barriers to brownfield regeneration by developing and providing customised problem- and target-oriented packages of approaches, technologies and tools.

test
sites

TIMBRE objectives will be dealt with by focusing on single sites (between 5 and 340 acres), their regional scale or on registers of sites (e.g. former military areas of Soviet army in East Germany of 50,000 acres).



Sites and registers were chosen to test and elaborate the timbre instruments, taking into account different national and regional characteristics that are assumed to influence brownfield revitalization.

For more information visit:



timbre

As a unique asset, timbre work packages include the cultural and administrative characteristics and their regionally distinctive features.

By providing a customizable toolbox specifically addressing diverse processes that have to be dealt with during the course of a regeneration project, end-users will be enabled to find customized as well as site specific solutions.

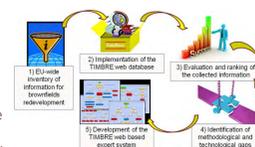
The timbre project will further-more deliver a tailored training and dissemination program as part of an information centre that will transfer existing and emerging knowledge to the scientific community and end-users.

timbre work packages

Come closer for more in-depth information

WP1: Expert System

The WP1 main objective is the development of an expert system collecting all available information concerning brownfields rehabilitation processes. In order to enhance brownfield regeneration processes on the basis of the improvement of existing methods, technologies, tools, and focusing on in-situ and on-site, cost effective and energy saving remediation technologies, WP1 will develop an expert system for the collection, analysis and classification of already available information on brownfields (i.e. accessible literature, data and further information on previous projects, programs and other activities dealing with the regeneration of brownfields). The expert system will allow easy accesses and an intuitive interface to collect information for all end-users. As reported in the image on the right, the steps for the development of the expert system are: i) the development of an EU-wide inventory of practicable solutions, technologies and instruments for brownfield regeneration; ii) the design of the timbre web database; iii) the evaluation and ranking of the collected approaches, methods and tools for brownfield regeneration; iv) the identification of methodological and technological gaps and v) the development of the expert system interfaces. → Contact: Antonio Marcomini marcom@unive.it and Lisa Pizzol lisa.pizzol@gmail.com



WP2: Decision structures and local culture: Investigation of administrative possibilities and site specific

Strategies for brownfield regeneration can differ greatly between regions. A better understanding of specific cultural contexts, regional political instruments and problem perceptions by local decision makers are crucial for an economically feasible and technically useful application of technologies, strategies and tools. This work package is focused on the identification and the evaluation of site specific and the culturally rooted practices of stakeholders involved in the revitalization of contaminated land in order to deliver some guidance on how to use existing technologies, methods and tools more efficiently. Focussing on concrete sites in Romania, the Czech Republic, and Poland (see WP 4) a major goal of this WP is to develop a framework for analyzing decision structures in brownfield revitalization as well as for the identification of hindrances and unused potential of technologies and tools. In order to deliver in-depth knowledge on the cultural foundations of dealing with contamination, the Romanian test sites will be investigated via the focus group method. By so doing, this work package shall deliver bottom-up social information for WP 3 and WP 6, and will also serve as a general information platform for all technology and tool developments in the project. → Contact: Matthias Groß matthias.gross@ufz.de

WP4: Strategies and technologies for integrated site characterisation and remediation

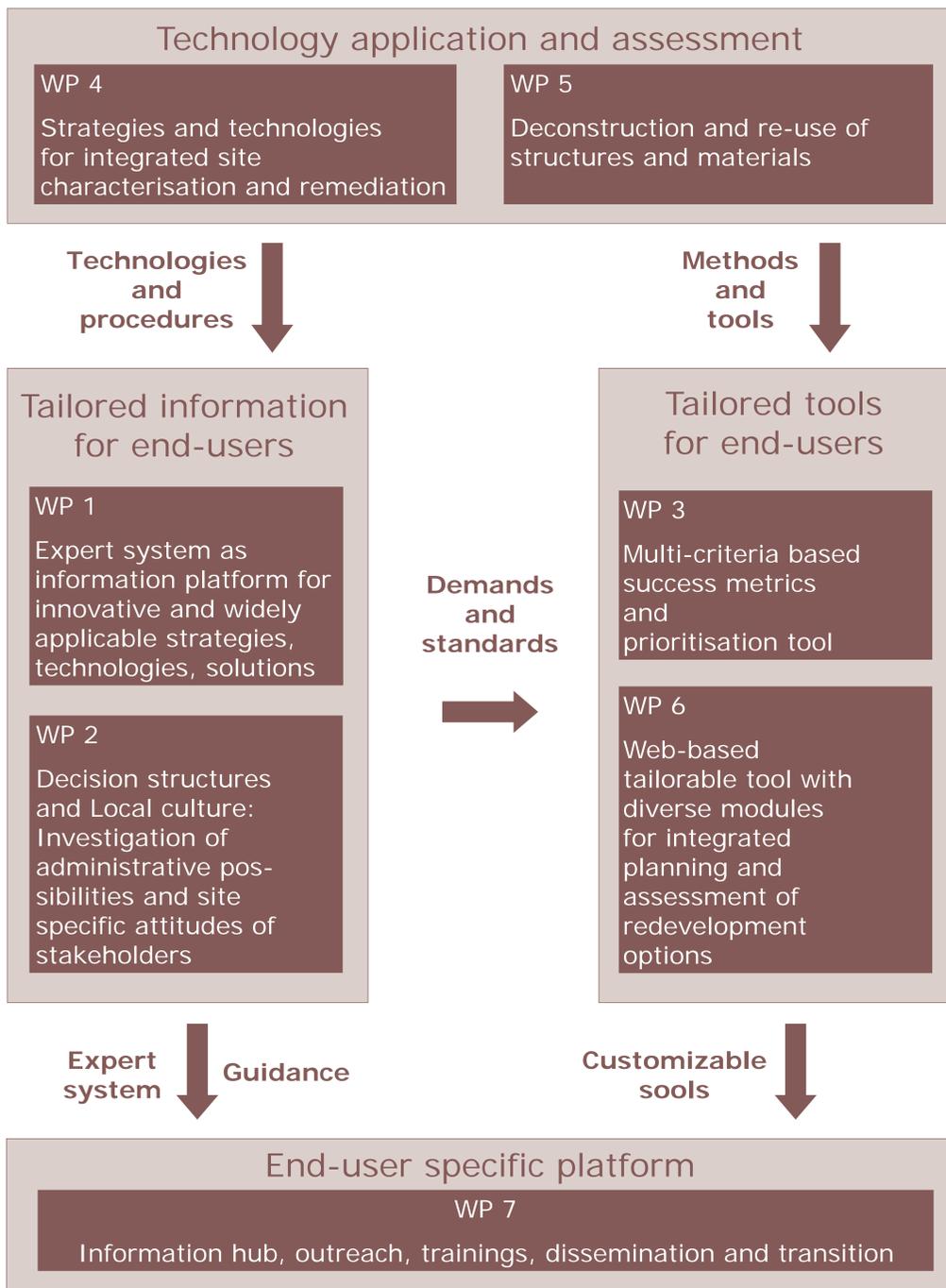
In WP4, emerging strategies and technologies for effective site characterisation and remediation will be adapted, further developed and tested, addressing: (i) feasibility testing of phytoremediation and specific soil washing with recycled solutions (SSWRS), (ii) novel strategies for effective site characterisation and monitoring of subsurface contamination and remediation, (iii) evaluation of remedial options using site models, based on adaptive site characterisation. Feasibility testing of phytoremediation will comprise laboratory studies on plant uptake and phytotoxicity of common soil and groundwater pollutants as well as mathematical modelling to quantify and simulate phytoremediation. Feasibility testing of SSWRS will include field (in situ and on-site) and laboratory experiments on process robustness, performance and suitable target compounds. Pollutant transfer by SSWRS will be assessed by mathematical modelling. Tree core sampling and direct push/shallow soil probing will be applied adaptively at selected sites and assisted by numerical modelling in order to test feasibility, limitations and effectiveness of these technologies for site characterisation. Studies on potentials, costs and associated risks of in situ remediation techniques will point out which measures may, or may not, be successful and appropriate at a site. The evaluated set of methodologies will provide tools for integrated planning and assessment of regeneration options. → Contact: Arno Rein arnr@env.dtu.dk

WP5: Technology implementation for deconstruction and re-use of contaminated materials

At present, innumerable companies are planning new office buildings or shopping centres as a substitute for their presently used building from the 1950s to 1970s. This kind of buildings are traditionally contaminated by building pollutants (e.g. asbestos, artificial mineral fibres, heavy metals etc.). The decision of an investor to develop a new building either on an existing property or on green land is dependent on the costs for a revitalisation of the existing building / existing ground. The deconstruction of a standard administrative building, e.g. of 100,000 m³, leads to a possible volume of dump material of 25,000 m³. The quality of the dump material ranges from concrete rubble over light building material to building contaminants. Most of this building rubble can be brought back into the material cycle under certain conditions. The percentage of recyclable material depends on the pre-investigation of the building structure, the method of destruction / separation of material and the processing methods. Within TIMBRE a standard technology implementation procedure for investors for the reuse of existing buildings and to safe the environment such as strategies for the environmentally friendly destruction of buildings will be developed under respect of the existing different national laws. Because the deconstruction and re-use of buildings and structures is not set down in an EU-wide law or directives, within TIMBRE a proposal shall be developed to standardise such procedures. → Contact: Manfred Kühne kuehne@geoexperts.de

WP7: End-user oriented web based internet information platform and specific training opportunities

The usage and implementation of environmental technologies for brownfield regeneration so far can be summarised as "good results, helpful tools but bad PR and integration of both social/cultural and technical aspects". Indeed, on the EU level help-websites do exist, but they do not function the way they should (if they are updated at all). In general, this type of information is very difficult to access for regional/local actors from a technical point of view alone. TIMBRE thus will provide a unique information centre for brownfield development strategies including the description and a range of novel technologies on offer (plant based site investigation, phytoremediation technology soil washing technology) and tools (expert system, socio-economic framework, prioritisation tool, cost estimation tool for deconstruction and re-use of contaminated materials) developed in the TIMBRE project. In order to ensure a targeted dissemination of the TIMBRE outcomes, end-user specific training courses will be provided accompanied by appropriate publication formats that fulfil the requirements and demands of brownfield site owners, developers, regulators, and other stakeholders involved in regeneration projects. → Contact: Stephan Bartke stephan.bartke@ufz.de and Martin Bittens martin.bittens@ufz.de



www.timbre-project.eu

