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Optimising value from the soft re-use of brownfield sites

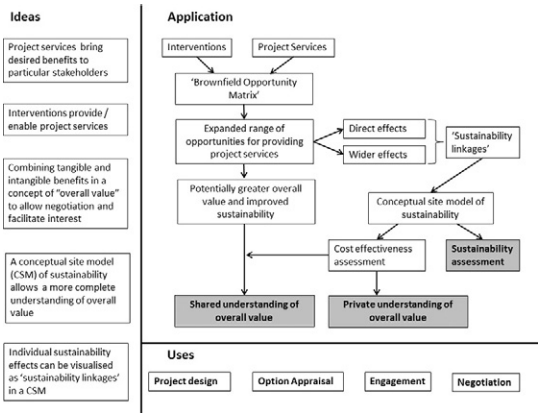
R. Paul Bardos [a,b,*], Sarah Jones [a], Ian Stephenson [c], Pierre Menger [d], Victor Beumer [e], Francesca Neonato [f], Linda Maring [e], Uwe Ferber [g], Thomas Track [h], Katja Wendler [h]

[a] r3 environmental technology Ltd, H9 TOB1, University of Reading, Whiteknights Campus, Reading, UK
[b] School of Environment and Technology, University of Brighton, Brighton, UK
[c] VERTASE-FLI, 19 Napier Court, Barlborough Links, Barlborough, Sheffield S43 4PZ, UK
[d] Tecnalia Research and Innovation Parque Tecnológico de Bizkaia, Derio, E-48160, Bizkaia, Spain
[e] Deltares, Rotterdamseweg 185, Delft 2629HD, The Netherlands
[f] PN Studio, viale Monte Nero 12, 20135 Milan, Italy
[g] PROJEKTGRUPPE STADT + ENTWICKUNG, Ferber, Graumann und Partner, Stieglitzstrasse 84, 04229 Leipzig, Germany
[h] DECHEMA e.V., Theodor-Heuss-Allee 25, D-60486 Frankfurt a.M., Germany

HIGHLIGHTS

- The FP7 HOMBRE project has been investigating the soft re-use of brownfield sites.
- The multiple benefits of soft re-uses of brownfields may not be easy to value.
- Considering specific project services provides a way of examining overall value.
- "Overall value" combines tangible & nontangible elements, linked to sustainability.
- Conceptual site models can be used to clearly describe services & sustainability.

GRAPHICAL ABSTRACT



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ABSTRACT

Soft re-use of brownfields describes intended temporary or final re-uses of brownfield sites which are not based on built constructions or infrastructure ('hard' re-use). Examples of soft re-uses include the creation of public green space. These are essentially uses where the soil is not sealed. Often the case for soft re-use of brownfields has not been easy to demonstrate in strictly financial terms. The purpose of this paper is to describe a value based approach to identify and optimise services provided by the restoration of brownfields to soft re-uses, on a permanent or interim basis. A 'Brownfield Opportunity Matrix' is suggested as means of identifying and discussing soft restoration opportunities. The use of 'sustainability linkages' is suggested as a means of understanding the sustainability of the services under consideration and providing a structure for the overall valuation of restoration

* Corresponding author.
E-mail addresses: paul@r3environmental.co.uk (R.P. Bardos), istephenson@vertasefli.co.uk (I. Stephenson), pierre.menger@tecnalia.com (P. Menger), Victor.Beumer@deltares.nl (V. Beumer), info@pnstudio.net (F. Neonato), Linda.Maring@deltares.nl (L. Maring), Uwe_Ferber@projektstadt.de (U. Ferber), track@dechema.de (T. Track), wendler@dechema.de (K. Wendler).

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Decision support
Sustainability assessment
Sustainability linkages
Conceptual site models

work, for example as part of design or option appraisal processes, or to support the solicitation of interest in a project.

1. Introduction

Brownfields are a latent resource in sustainable land management. Brownfields are a symptom of changing times. While the presence of brownfields provides the necessary 'free' space for new developments within the urban environment – to meet evolving societal demands – brownfields often persist for longer than desirable. The recent European HOMBRE project[1] argues that a clearer vision on what a brownfield site has to offer in responding to current and emerging societal challenges would help overcome such barriers (HOMBRE Consortium, 2014).

'Circular land management' is a concept encapsulating sustainable and repeated use of development land: avoiding new brownfields, recycling existing brownfields and compensating the effects of land consumption (Ferber et al., 2011; HOMBRE Consortium, 2014; Van Arkel, 2012). An important factor in circular land management is the reduction of both greenfield consumption and brownfield production. This can be achieved by maintaining land in productive use as far as possible, but where it falls out of use, to make sure its transition to a new land use is as rapid as possible. The return to use of land could be for built redevelopment, or for soft re-uses such as for urban green space. A possible intermediate scenario is that there may be an interim use, prior to longer term re-establishment into the land cycle (Holland et al., 2013; Seeds Consortium, 2015).[2]

'Hard' developments describe some form of building or infrastructure, and 'soft' re-use describes forms of use that do not involve substantial construction (Cundy et al., 2013). Soft land-use is where the land remains unsealed and the soil remains in biologically productive use, for example for agriculture, habitat, forestry, amenity or landscaping. The two scenarios are not mutually exclusive. Many development scenarios include both types of usage, for example landscaping in generally built up areas, or a visitor centre on a brownfield regenerated for public amenity. Hence EU policy on 'soil sealing' (EC, 2012) can also be used as a context for distinguishing between hard and soft land usage. We suggest hard land usage is defined as re-use that predominantly contains built or paved development.

While historically there has been a preference for hard redevelopment of brownfield land (Ling et al., 2003), regeneration of brownfield areas for soft re-uses, such as green open space areas for amenity, is used for brownfield restoration in a number of countries including Germany, the United Kingdom and the Netherlands (Sarni, 2009; Thornton et al., 2007; RESCUE, 2005).[3] There have been many successful examples of restoration to soft re-uses across Europe over the past 50 years. For example, garden exhibitions have been developed on brownfield sites including in Hamm, Germany and Glasgow, UK (Engel, 1988). However, the case for soft re-use restoration can be hard to demonstrate in strictly financial terms (Chilton et al., 2009). Where the direct economic benefits of restoration are not always readily identifiable as is the case when brownfields are to be regenerated into soft re-uses, it can be helpful for decision-makers to be fully aware of broader opportunities and benefits (including problems caused by disamenity) that can emerge from brownfield restoration, and how these opportunities and benefits translate into a more comprehensive understanding of overall value, as described in Section 6.

The purpose of this paper is to describe a value-based approach for optimising services from restoration of brownfields for soft re-use on a permanent or interim basis developed by the HOMBRE project (Beumer et al., 2014; Menger et al., 2013). The value of restoration underpins the rationale for any public or private investment in brownfield restoration. We believe that in some cases this value is too narrowly costed, and opportunities for improving an overall proposition of value are being missed. Synergies between improvements in environmental, economic and social services could enhance the overall value of brownfield restoration and so help create expanded opportunities for brownfield re-use. This paper sets out the components of a common framework, shown in Fig. 1, for different stakeholders to propose, estimate and discuss *overall value* from the restoration of brownfields into soft re-use (*i.e.* non-sealed soil based redevelopment of land). Applying this framework would provide a structure for the overall valuation of restoration work, for example as part of design or option appraisal processes, or to support the solicitation of interest in a project.

The key components of this framework, shown in Fig. 1, include:

- Several conceptual ideas: 'project services', 'overall value' and 'sustainability linkages';
- A tool for maximising the scope of potential opportunities from brownfield reuse (the 'Brownfield Opportunity Matrix' (BOM);
- Approaches for understanding sustainability and overall value; and
- A process to support decision-making and design in planning soft re-uses for brownfield land based on sustainability and a shared understanding of overall value.

The process has four broad stages: (1) making use of the BOM to identify a range of project services from soft re-use and their potential value; (2) building a conceptual site model (CSM) using 'sustainability linkages' taking both the direct and wider effects of these services into account; (3) using the CSM to provide a framework for sustainability assessment and cost effectiveness assessment; (4) using these assessments to provide a shared understanding of overall value, and also private understandings of monetised value that are individual to particular stakeholders (especially potential investors), but linked to the generally shared opinion of cost effectiveness.

This paper cites extensively from grey literature as much of the state of the art in brownfields restoration has been developed in the practitioner domain.

2. Rationale

The value of land is dependent on the type of land use and the demand for that land use (Syms and Weber, 2003). Markets discount the value of degraded land, such as brownfield land, based on assumptions relating to the likely direct and indirect costs of rehabilitation. The effect of these constraints on a site's value can persist even after the completion of remediation (Bartke, 2011). Brownfield sites with land contamination problems are likely to be particularly disadvantaged because of their higher liability burden. Liabilities relate to potential losses, typically monetary, but other types of loss are possible, for example reputational (NICOLE, 2011). However, a *change* in land use can substantially increase land value, for example, a change from an industrial use to a use for retail and housing. The effect of land use change on value is dependent on location and market rates for similar land uses in the

[1] Holistic Management of Brownfield Regeneration, co-funded by the European Union's Seventh programme for research, technological development and demonstration under grant agreement no. 265097. www.zerobrownfields.eu.

[2] These processes of transition are broadly referred to as brownfield restoration or regeneration (CABERNET, 2006; RESCUE, 2005). This does not imply that the former use of the land has been restored, but that some additional level of functionality has been restored.

[3] Additional examples are in an on-line library produced by HOMBRE at http://dtvirt8.deltares.nl/bfnlibrary/htdocs/.