

# Design and comparative evaluation of sustainable land use alternatives for brownfield redevelopment

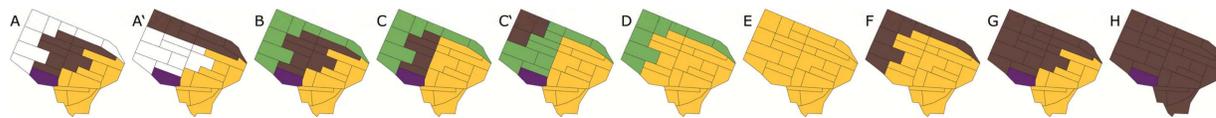
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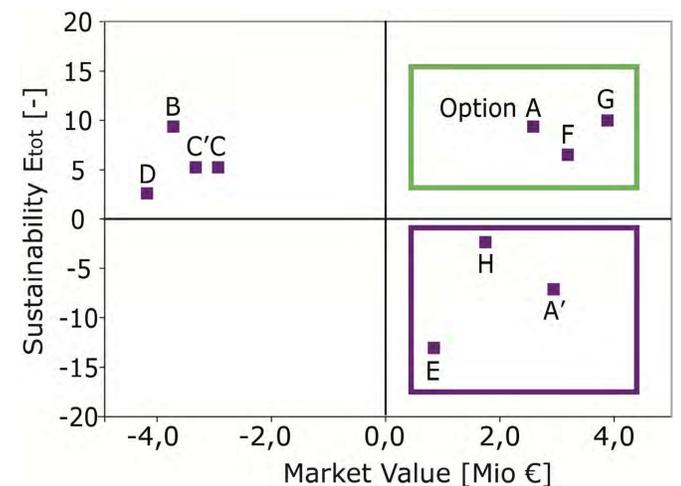
**The Problem:** The reduction of land consumption is increasingly seen as a vital aspect of sustainable development. In many countries the redevelopment of brownfields has the potential to significantly contribute to this reduction. Since the redevelopment process is often complicated e.g. by uncertainties regarding the contamination of the site, anticipated costs of required clean-up and by intricate negotiation among stakeholders with differing interests, many brownfields to date remain undeveloped.

**Our approach:** We present a Decision Support System (DSS) for the design and comparative evaluation of land use alternatives for brownfields. The DSS supports decision makers in assessing pros and cons of planning alternatives and facilitates communication among stakeholders. It features a spatial planning and assessment framework with novel approaches for the evaluation (i) of costs for clean-up of soil and groundwater, (ii) of the site's value and perceived market risks, and (iii) of the contributions of different planning options to sustainable development.



## 1. Step: stakeholder-based iterative planning of redevelopment options

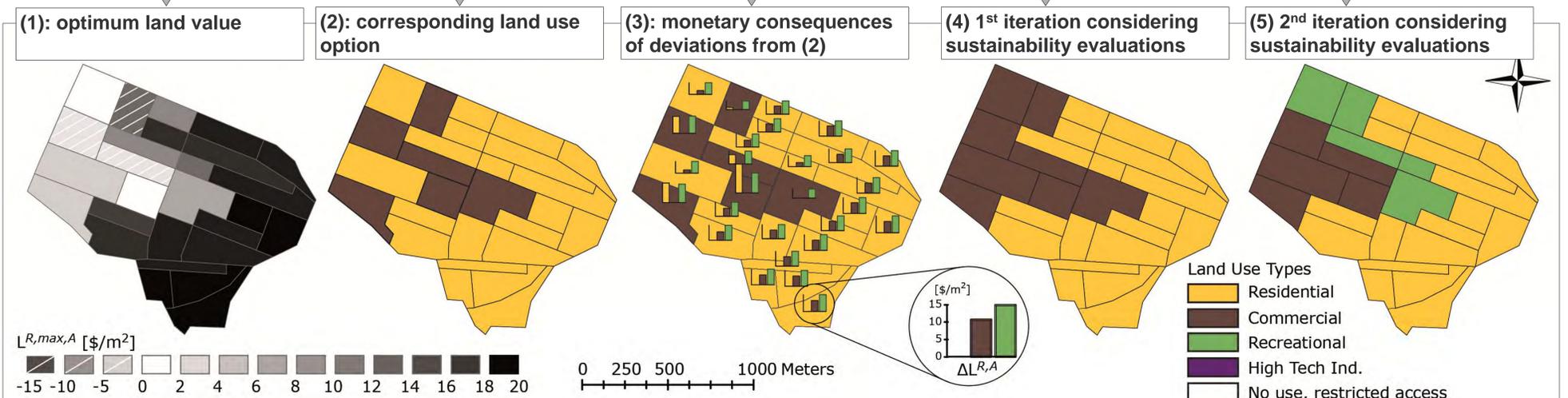
Results suggest that sustainable planning options on the case study site (a 110ha brownfield) are not necessarily tied to additional expenses. The importance of integrated planning is underlined by showing that economically attractive redevelopment is not inherently sustainable.



## 2. Step: deterministic design of planning alternatives

Spatial evaluation of existing contamination, planned future land use, and the resulting optimized remediation scenarios, market-oriented risk rebates, and location-quality-corrected land values, leads to a deterministically "optimized" land value (1). The initial planning option (2), which corresponds to this simplistic economical optimum, serves as a starting point for the (re)planning process. The latter is guided by visualizing the monetary consequences of reallocating or redistributing the land use types on the site (3).

The contribution to sustainable development is evaluated for different uniformly allocated land use types. Planning iterations are then generated by integrating this knowledge into the initial planning options, thereby providing redevelopment alternatives that are economically attractive and optimally sustainable at a time.



REFERENCES: (1) Schädler et al., J. Contaminant Hydrology 127 (2012) 88–100; (2) Schädler et al., J. Environmental Management 92 (2011) 827–837.

Free download of SAFIRA II Megasite Management Toolsuite software & documentation:

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