ECONOMIC PERSPECTIVES OF BROWNFIELD DEVELOPMENT
An Integrated Approach – Case Study Stuttgart, Germany

Johannes M. Dörle
Architect, M.Sc. Infrastructure Planning
Ghent, May 16th 2013
OUTLINE

1. Introduction
2. Appraisal of Brownfields
3. Integrated and Area-oriented Approach
4. Case Study Stuttgart, Germany
5. Conclusion
1. INTRODUCTION
Sustainable Brownfield Development
1. Introduction

Content + Objective

Understanding of actions and effects of integrated approaches in urban planning and inner-urban development from the perspectives of municipalities with focus on the economic aspects to attract private investment.
1. Introduction

Urban Development

CITY X

Inner-urban development

Urban expansion

Urban expansion

Urban expansion
1. Introduction

Urban Development

- Predominantly Brownfield Development
- Predominantly Greenfield Development

CITY X
1. Introduction

Definition of Term
No common European Definition for Brownfield

CABERNET (Concerted Action on Brownfield and Economic Regeneration Network) defines Brownfields as sites which:

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

Source: CABERNET, 2006, p. 23
1. Introduction

Economics of Sustainable Brownfield Development

Reintegration
(economic issue)

Risk

Market Value
concept demand

Regulation and Administration

Revitalisation
(social issue)

result (quality)
approach

Remediation
(environmental issue)

Risk

Market Value
quality required
costs

Reclamation Costs
# 1. Introduction

## Conceptual Overview

<table>
<thead>
<tr>
<th>Objective</th>
<th>Policies</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sustainable Reintegration</strong> of former small CHC contaminated Brownfields into the economic market cycle</td>
<td><strong>Remediation</strong>&lt;br&gt;Reduction of reclamation cost</td>
<td><strong>Integrated Approach</strong> (urban level) <strong>Area-oriented Approach</strong> (urban level)</td>
</tr>
<tr>
<td><strong>Revitalization</strong>&lt;br&gt;Increase of market value</td>
<td><strong>Institution</strong>&lt;br&gt;Improvement of administrative processes</td>
<td></td>
</tr>
<tr>
<td><strong>Risk</strong>&lt;br&gt;Minimization of Market oriented risk reduction</td>
<td></td>
<td><strong>Integrated Approach</strong> (project level) <strong>Area-oriented Approach</strong> (project level)</td>
</tr>
</tbody>
</table>
2. APPRAISAL OF BROWNFIELDS
An Economic Perspective
2. Appraisal of Brownfields

The Conceptual Model: A-B-C Model
Categorization of Marketability of Brownfield sites

Market Value (after reclamation)

Source: CABERNET, 2006, p. 44

Category A:
Self Developing Sites
Privat Driven Projects

Category B:
Potential Development Sites
Public-Private Partnership

Category C:
Public Driven Projects
### 2. Appraisal of Brownfields

#### Assessment Scheme

<table>
<thead>
<tr>
<th>Group of Criteria</th>
<th>Criteria</th>
<th>Scenario 1</th>
<th>Scenario 2</th>
<th>Scenario 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulation and Administration (BauGB, 1999), (City Chlor (a), 2011)</td>
<td>Influence of policies with preference for inner-urban development</td>
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<td></td>
<td>Organisation</td>
<td></td>
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<td></td>
<td>Communication</td>
<td></td>
<td></td>
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<tr>
<td>Market Value (WentV, 1988)</td>
<td>Status of development</td>
<td></td>
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<tr>
<td></td>
<td>Form and extend of structural use</td>
<td></td>
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<td></td>
<td>Value influencing rights and burdens</td>
<td></td>
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<td>Legal status of fees and cessions</td>
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<td></td>
<td>Standby time for structural or other utilizations</td>
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<td></td>
<td>Composition and character of the land property</td>
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<tr>
<td></td>
<td>Location</td>
<td></td>
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</tr>
<tr>
<td>Reclamation Costs (difu, 2006)</td>
<td>Demolition</td>
<td></td>
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<tr>
<td></td>
<td>Remediation and Disposal (including costs for future observations)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Risk ((REFINA, 2011))</td>
<td>Stigma and marketing risk</td>
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<tr>
<td></td>
<td>Risk of investment</td>
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<td></td>
<td>Risk of usability</td>
<td></td>
<td></td>
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<td></td>
<td>Risk of utilization</td>
<td></td>
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<tr>
<td><strong>Sum</strong></td>
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</tr>
</tbody>
</table>
4. CITY CHLOR MEASURES

Integrated Approach
Area-Oriented Approach
4. Integrated and Area-Oriented Approach

Definition

**Integrated approach:**
Combination of all relevant aspects
- Urban Planning and Development
- Environmental Engineering
- Organisation and Communication
- Socio-economic aspects

**Area-oriented approach:**
- Remediation of large urban areas instead of case-by-case procedure
- All contaminated Brownfields embedded in urban planning and development
4. Integrated and Area-Oriented Approach

Perspectives of Brownfield Development - Workflow

Urban Planning

The need for remediation influences the Urban Planning approach.

Integrated investigation
Integrated remediation
Integrated revitalization
Integrated management

Area-oriented investigation
Area-oriented remediation
Area-oriented revitalization
Area-oriented management

Top Down

Integrated urban planning and development strategies consider all contaminated sites and their remediation.

Bottom Up

contaminated Brownfield
## Actions of Integrated and Area-oriented Approach

<table>
<thead>
<tr>
<th>Urban level (Macro level)</th>
<th>Project level (Micro level)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Urban planning and urban development (Revitalization)</strong></td>
<td>Integrated and Area-oriented development concept for the Brownfield site</td>
</tr>
<tr>
<td>Consideration of all Brownfield sites for inner-urban development</td>
<td>Remediation concept integrated into the construction process</td>
</tr>
<tr>
<td>Integrated and Area-oriented specific site-related development strategy for the micro level</td>
<td></td>
</tr>
<tr>
<td><strong>Environmental engineering (Remediation)</strong></td>
<td>Integrated and Area-oriented investigation of soil, groundwater and indoor air pollution and its sources</td>
</tr>
<tr>
<td>Survey of contaminated Brownfields and categorization of contaminations (criteria: contamination, possible uses, cost estimates), Prioritisation</td>
<td>Integrated and Area-oriented remediation of Hot Spots considering all exposure pathways</td>
</tr>
<tr>
<td><strong>Organisation and communication (Management)</strong></td>
<td>Integrated and Area-oriented communication and coordination of Brownfield development</td>
</tr>
<tr>
<td>Integrated and Area-oriented initiation of Brownfield development procedure, eventually purchase of neighbouring properties</td>
<td></td>
</tr>
<tr>
<td><strong>Economic aspects (Reintegration)</strong></td>
<td>Reduction of risks (integrated and area-oriented investigation of contaminants)</td>
</tr>
<tr>
<td>Improvement of administrative processes (Interdisciplinary project groups, project manager, area manager), Increase of market value (upgrade of micro level around Brownfield site), Reduction of risks (coordinated, streamlined, transparent administrative processes)</td>
<td>Increase of Market Value (extension of development site)</td>
</tr>
<tr>
<td>Reduction of reclamation costs (hot spot remediation)</td>
<td>Reduction of reclamation costs (integrated remediation and construction process)</td>
</tr>
</tbody>
</table>
4. Integrated and Area-Oriented Approach

Integrated Urban Planning with Area-Oriented Approach
- Urban Level (Top down)

Data Acquisition and Evaluation

Public Property

Brownfields

Priorisation

Categorization

Clustering

Renewal Area

Project Level

Bought by Public (contaminated)

Priority of Remediation

A, B, C

Reasonable Areas for Area-oriented Approach

Real Estate Cadastre

Contaminated Sites

1st Priority

2nd Priority

3rd Priority
4. Integrated and Area-Oriented Approach

Area-Oriented Approach – Project Level (Bottom up)

- Private Property
- Public Property/Investor
- Public Property contaminated
- Courtyard

Plot Sizes:
- 500 m²
- 3500 m²
5. CASE STUDY
Stuttgarter Strasse 10, Stuttgart-Feuerbach, Germany
5. Case Study Stuttgart

Why Stuttgarter Strasse 10

Pilot Site Boundary Conditions

- Inner-urban site densely built up
- Small site (ca. 700m²)
- VOC contaminated
- Highly polluted soil and groundwater
- Polluter known but cannot hold liable
- Public property
- Difficult geology
- Source zones partly beneath existing buildings
5. Case Study Stuttgart

Case Study Area – Urban level

- Feuerbach affected by structural change
- Population Growth 2.6% (Stuttgart 0.2%)
- Policy: Priority for Inner-urban development, Reduction of traffic, short ways
- Priority Area: Designated for Urban Development and Urban Renewal

Source: LHS Stuttgart (b), 2004, p. 16
LHS Stuttgart (a), 2003, p. 140
5. Case Study Stuttgart

Case Study Area – Project level (Micro level)
Criteria: Accessibility, centrality
5. Case Study Stuttgart

Case Study Area – Project level (Micro level)
Criteria: Environmental quality and emissions

Contaminated Brownfield
New commercial developments
Brownfield
New Playground
Urban Renewal Area
Source: (LHS Stuttgart (e), 2008)
5. Case Study Stuttgart

Case Study Area – Project level (Micro level)

Criteria: Planned development activities

Source: (LHS Stuttgart (e), 2008)
5. Case Study Stuttgart

Case Study Area – Project level (Site level)

History:

- Office buildings (1888)
- Factory building (1955)
- Metal production (1946-76)
- Public property since 1990
- Detection of contaminations (1991)
- Soil vapour extraction (1993-94)
- Pump & Treat (1994-2010)
- Urban renewal (2000-2011)
- Detailed investigation (2008-2009)
- Pilot Site City Chlor (2009)
- Remediation plan (2011)
- Pilot Remediation (2013)

Source: ISAS
5. Case Study Stuttgart

Case Study Area – Project level (Site level)

Localisation of Contaminations

Source: Arcadis, 2011
5. Case Study Stuttgart

Case Study Area – Project level (Site level)

Plume

CHCs at site
- Mostly 1,1,1-trichloroethane (TCA)
- Secondarily trichloroethylene (TCE) and perchloroethylene (PCE)

Source: Magic
## 5. Case Study Stuttgart

### Appraisal of Marketability

Land Market Value Calculation

- **A-site:** earnings > costs
- **B-site:** earnings = costs
- **C-site:** earnings < costs

\[
FMW = (UVW + F) - (GK + AK + SL + P + K)
\]

<table>
<thead>
<tr>
<th></th>
<th>Market Value (UVW) [€]</th>
<th>Funding (F) [€]</th>
<th>Purchase Price (GK) [€]</th>
<th>Reclamation Cost (AK) [€]</th>
<th>Land Market Value (FMW) [€]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Case 1</strong></td>
<td>500,000</td>
<td>0</td>
<td>0</td>
<td>250,000</td>
<td>-280,000</td>
</tr>
<tr>
<td><strong>Case 2</strong></td>
<td>500,000</td>
<td>0</td>
<td>0</td>
<td>250,000</td>
<td>-750,000</td>
</tr>
</tbody>
</table>

→ **C-site:** earnings < costs

Source: difu, 2006, p. 56; Arcadis, 2011, p. 65
5. Case Study Stuttgart

**Appraisal of Marketability**

Land Market Value Calculation

A-site: earnings > costs  
B-site: earnings = costs  
C-site: earnings < costs

Without funding earnings are far below the reclamation costs.

In order to reduce costs for the public in general either the market value has to be increased or the reclamation costs have to be decreased or a combination of both.

<table>
<thead>
<tr>
<th></th>
<th>Market Value (UVW) [€]</th>
<th>Funding [€]</th>
<th>Purchase Price [€]</th>
<th>Reclamation Cost [€]</th>
<th>Land Market Value (FMW) [€]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1</td>
<td>500,000</td>
<td>0</td>
<td>0</td>
<td>250,000</td>
<td>530,000</td>
</tr>
<tr>
<td>Case 2</td>
<td>500,000</td>
<td>0</td>
<td>0</td>
<td>250,000</td>
<td>1,000,000</td>
</tr>
</tbody>
</table>

Source: difu, 2006, p. 56; Arcadis, 2011, p. 65
5. Case Study Stuttgart

Potential for Development?
Appraisal of Case Study Area and Pilot Site

SWOT Analysis

to understand

which,
where,
who and

how actions have to be applied to improve marketability of the Pilot Site
## 5. Case Study Stuttgart

### STRENGTHS

<table>
<thead>
<tr>
<th>INTERNAL ORIGINS</th>
<th>Urban Level</th>
<th>Project Level</th>
<th>Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reintegration (Location)</td>
<td>Attractive location for housing and commerce (theatre, schools, community centre)</td>
<td>High centrality, high accessibility (PuT and PuT), mixed-use area, high densities, good public infrastructure, recreation (Killesberg) nearby</td>
<td>Regular cut, small site (no internal circulation costs) With two sites adjacent to street (no structural disturbance)</td>
</tr>
<tr>
<td>Revitalization (Urban Planning)</td>
<td>Neighborfood, balancing points for inner-urban development (MIV), mixed-use area, part of urban renewal area (Feuerbach 3)</td>
<td>Real estate in urban priority area (StVZ), public property (development can be guided)</td>
<td>Public property (development can be guided)</td>
</tr>
<tr>
<td>Remediation (Quality of land)</td>
<td>Polluted groundwater plumes are determined, existing remediation works identified and plans are elaborated</td>
<td>Hot spots are localized, existing remediation works identified</td>
<td>Hot spots are localized, existing remediation works identified and plans are elaborated</td>
</tr>
<tr>
<td>Management (Politics, Organisation, Communication)</td>
<td>Existing policies for attracting inhabitants and to supply housing, existing policies supporting inner-urban development, data and data management systems, NBS, “vacant lot” cadastre</td>
<td>Installed brownfield management for development of neighbouring Schöch Areal and new planning procedures applied (PDP “cooperative planning process” during REFINA project)</td>
<td>Installed brownfield management for development of neighbouring Schöch Areal and new planning procedures applied (PDP “cooperative planning process” during REFINA project)</td>
</tr>
</tbody>
</table>

### WEAKNESSES

<table>
<thead>
<tr>
<th>INTERNAL ORIGINS</th>
<th>Urban Level</th>
<th>Project Level</th>
<th>Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reintegration (Location)</td>
<td>Constriction for MIV from Stuttgart centre suboptimal, unattractive train station square and post office building, unattractive facades of neighbouring buildings</td>
<td>Rent for light rail and 2055</td>
<td></td>
</tr>
<tr>
<td>Revitalization (Urban Planning)</td>
<td>Pilot Site is not considered in Urban Planning strategies, contaminations are not actively considered</td>
<td>Fund of Urban Renewal Area “Feuerbach 3” already exhausted, small scale neighbouring plots</td>
<td></td>
</tr>
<tr>
<td>Remediation (Quality of land)</td>
<td>Highly contaminated neighbouring site (Schöch Areal), contaminations partly beneath neighbouring buildings</td>
<td>Buildings old, buildings have to be refurbished (partly contaminated)</td>
<td></td>
</tr>
<tr>
<td>Management (Politics, Organisation, Communication)</td>
<td>No interdisciplinary routine procedure for Brownfield development, site-by-site Brownfield development</td>
<td>No development concept or strategy for Pilot Site</td>
<td></td>
</tr>
</tbody>
</table>

“STRENGTHS” reflect the internal aspects, which contribute positively on the marketability of the Pilot Site.

“WEAKNESSES” reflect the aspects, which hamper the marketability of the Pilot Site.
## 5. Case Study Stuttgart

### SWOT Analysis

**OPPORTUNITIES** reflect the external aspects, which contribute positively on the marketability of the Pilot Site.

<table>
<thead>
<tr>
<th>OPPORTUNITIES</th>
<th>Urban Level</th>
<th>Project Level</th>
<th>Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reintegration (Location)</td>
<td>Expected population growth of 2.6% (among the highest outside the inner-city), More workplaces than inhabitants, Structural change increases possibility for urban upgrade on the micro level</td>
<td>New implementation plan with adequate higher densities, Upgrade of urban neighbourhood considering historical context, Qualitative architecture calming of B295</td>
<td>Qualified urban density, Increase of GRZ, New building construction as a barrier against noise, Mixed use with preference on housing</td>
</tr>
<tr>
<td>Revitalization (Urban Planning)</td>
<td>Structural change increases possibility for urban development, Smart development concept considering Schoch Areal, station development opportunity,</td>
<td>Integrated development (comprehensive concept for Pilot Site and its neighboring Brownfields)</td>
<td>Provision of qualitative housing, Sustainable developments, Experimental approaches</td>
</tr>
<tr>
<td>Remediation (Quality of Land)</td>
<td>Structural change increases possibility for (area oriented) remediation</td>
<td>Improvement of environment, and area-oriented remediation</td>
<td>Remediation of site, Reduction of remediation costs with integrated development concept (remediation and construction)</td>
</tr>
<tr>
<td>Management (Politics, Organisation, Communication)</td>
<td>Search for political support (positive development creates reputation), Interdisciplinary procedure (consideration of Pilot Site and neighboring plots)</td>
<td>Active communication with owner and investor</td>
<td></td>
</tr>
</tbody>
</table>

**THREATS** reflect the external aspects, which hamper the marketability of the Pilot Site.

<table>
<thead>
<tr>
<th>THREATS</th>
<th>Urban Level</th>
<th>Project Level</th>
<th>Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reintegration (Location)</td>
<td>Structural change causes Brownfields with risk for urban decline</td>
<td>No demand, No investor</td>
<td>No demand, No investor, Low architectural quality</td>
</tr>
<tr>
<td>Revitalization (Urban Planning)</td>
<td>No integrated and area-oriented development concept for the Pilot Site and its neighboring Brownfields</td>
<td>Low quality architecture, Remaining contaminations lead to private investments, No integrated urban development concept (Pilot Site + neighboring developments)</td>
<td>No development concept</td>
</tr>
<tr>
<td>Remediation (Quality of Land)</td>
<td>Area-oriented remediation is not applied, Long term process &amp; Travel</td>
<td>Low remediation result (contamination could not be eliminated), No remediation procedure, High remediation costs</td>
<td></td>
</tr>
<tr>
<td>Management (Politics, Organisation, Communication)</td>
<td>No political and public support, No interdisciplinary development procedures</td>
<td>No active communication and coordination</td>
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</tr>
</tbody>
</table>
Development Strategy
derived from the SWOT Analysis

The development strategy should
- boost existing strengths
- eliminate weaknesses
- implement opportunities
- mitigate threats on the urban and project level.

The development strategy
considers actions of the Integrated and Area-oriented Approach
- to increase the marketability
- by improving the administrative processes, increasing the market value, reducing reclamation costs and risks.
5. Case Study Stuttgart

Potential Analysis
identifies the possibilities of the site for a successful implementation of the development strategy

According to the development strategy the Pilot Site is analysed to check the possibility for:

- Application of area-oriented development
- Setting of higher qualified densities
- Implementation of mixed use with focus on qualitative housing
- Implementation of structural solutions to reduce impacts due to noise emissions
- Integration in existing development process (Schoch Areal, Krempel Areal)
5. Case Study Stuttgart

Potential Analysis
Application of Area-oriented Approach

Source: based on SIAS, processed by author
5. Case Study Stuttgart

Scenario Planning
Investigation of present benefits and bottlenecks.

Scenario 1 (Base Scenario):
No action; Continuation with Pump and Treat

Scenario 2:
Application of Integrated Approach

Scenario 3:
Application of Integrated and Area-Oriented Approach
5. Case Study Stuttgart

Scenarios are performed according to:

- Measure applied for development (Integrated approach, Area-oriented Approach)
- Involved actors (Public, Owner, Investor, Tenant)
- Plot size (sqm)
- GRZ, GFZ (sqm)
- Projected Design
- Actions conducted
- Effects on the Marketability and Reintegration
### 5. Case Study Stuttgart

**SCENARIO 2**

**Description:**
The investigation of contaminants is carried out through the municipality. The site shall be developed together with the private sector. The currently valid building law (Baustaffel 3) is confronted with the current status and possible maximum densities.

**Applied Measure:** Integrated Approach

**Actors:** Public → Tenant, Investor

**Plot Size:** 730 m²

<table>
<thead>
<tr>
<th></th>
<th>GRZ</th>
<th>GFZ</th>
<th>Area</th>
<th>Floor Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>0.40</td>
<td>1.20</td>
<td>292.00</td>
<td>876.00</td>
</tr>
<tr>
<td>Status</td>
<td>0.64</td>
<td>1.50</td>
<td>467.20</td>
<td>1095.00</td>
</tr>
</tbody>
</table>

**Projected Design:**
- **Mixed Use (60% housing, 40% commerce)**
- **3-4 stories**
  - GRZ: 0.6
  - GFZ: 1.85
- **Area:** 450 m²
- **Floor Space:** 1360 m²
- **Housing:** 810 m²
- **Commerce:** 540 m²

**Actions of Integrated Approach:**

<table>
<thead>
<tr>
<th>Fields of Actions</th>
<th>Urban Level</th>
<th>Project Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Macro level)</td>
<td>(Micro level)</td>
<td>(Site)</td>
</tr>
<tr>
<td>Revitalization</td>
<td>Elaboration of specific site-related provident development strategy for neighbourhood on micro level and site (upgrading, GRZ, GFZ, Traffic) → (MV)</td>
<td>Observation of neighbourhood and site for upgrade and integrated development strategy → (MV)</td>
</tr>
<tr>
<td>Remediation</td>
<td>Preparation of categorized (contaminations, possible uses, remediation costs) and prioritized (risk situation) data → (MV, RC, R)</td>
<td>Integrated investigation of pollutants and its sources regarding soil, groundwater, indoor air → (R, RC)</td>
</tr>
<tr>
<td>Management</td>
<td>Initiation of Brownfield development procedure</td>
<td>Communication and coordination of Brownfield development</td>
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</tbody>
</table>

**Effects on the Reintegration:**

<table>
<thead>
<tr>
<th></th>
<th>Revitalization</th>
<th>Remediation</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Upgrade of neighbourhood (green areas, traffic reduction)</td>
<td>Comprehensive data as a basis for successful communication with investor</td>
<td>Active development process</td>
</tr>
<tr>
<td></td>
<td>Consideration of Urban Development or Urban Renewal Areas (Funding for demolition)</td>
<td>Comprehensive data is basis for sustainable planning decisions</td>
<td>Comprehensive data as a basis for successful communication with investor</td>
</tr>
<tr>
<td></td>
<td>Integrated development concept for the site considering the environmental urban conditions on the micro level</td>
<td>Clear determination of sources (less remediation work)</td>
<td>Comprehensive data as a basis for sustainable planning decisions</td>
</tr>
<tr>
<td></td>
<td>Initiating development processes in the neighbourhood (Rising public awareness, Communication with investor, Marketing)</td>
<td>Comprehensive clean up of contaminants</td>
<td>Comprehensive data is basis for sustainable planning decisions</td>
</tr>
<tr>
<td></td>
<td>Higher possible densities for the site (GRZ, GFZ)</td>
<td>Remediation of Risks</td>
<td>Comprehensive data as a basis for sustainable planning decisions</td>
</tr>
<tr>
<td></td>
<td>Integrated remediation procedure (reduction of costs due to reduced risk for existing buildings, security measures, synergistic effects with e.g. cellar or underground parking, reduced amount of contaminated soil)</td>
<td>Remediation of Risks</td>
<td>Remediation of Risks</td>
</tr>
</tbody>
</table>

**Bottlenecks:**

- Remediation difficult due to narrow space
- Additional costs for assurance of neighbouring buildings Kermser Straße 14 and Stuttgartor Straße 8a during remediation and construction
- Remediation result limited due to existing contaminations beneath neighbouring building Kermser Straße 14
- Application of innovative and cheaper method difficult due to danger for neighbouring buildings Kermser Straße 14
- Unsatisfactory urban solution

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Final Conference City Chlor I Ghent I 16th May 2013 38

Johannes M. Dörle
5. Case Study Stuttgart

Scenario 2: Bottlenecks

- Remediation difficult due to narrow space
- Additional costs for assurance of neighbouring buildings Kermser Straße 14 and Stuttgarter Straße 8a during remediation and construction
- Additional Risks
- Remediation result limited due to existing contaminations beneath neighbouring building Kermser Straße 14
- Application of innovative and cheaper method difficult due to danger for neighbouring building Kremser Straße 14
- Unsatisfactory urban solution

**Bottlenecks are mainly related to:**

- Difficulty to access and clean up hot spots
- Risks due to densely built up neighbourhood
- Risk whether all contaminations can be cleaned up
- Unsatisfactory urban solution
5. Case Study Stuttgart

**SCENARIO 3**

**Description:**
Investigation of contaminants is carried out through the public. The site shall be developed together with the private sector. Remediation shall be integrated in the construction process. The currently valid building law (Baustoffel 3) is confronted with the current status and possible maximum densities. The remediation and development of S10 is carried out along with adjacent sites.

**Applied Measure:** Integrated Approach and Area-oriented Approach

**Actors:** Public → Owner, Tenant, Investor

**Plot Size:** 2466 m²

<table>
<thead>
<tr>
<th></th>
<th>GRZ</th>
<th>GFZ</th>
<th>Area</th>
<th>Floor Space</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current law</strong></td>
<td>0,40</td>
<td>1,20</td>
<td>986,80</td>
<td>2959,20</td>
</tr>
<tr>
<td><strong>Status</strong></td>
<td>0,46</td>
<td>1,20</td>
<td>1134,40</td>
<td>2959,20</td>
</tr>
</tbody>
</table>

**Projected Design:**
Mixed Use (60% housing, 40% commerce)
3-4 stories

<table>
<thead>
<tr>
<th></th>
<th>GRZ</th>
<th>GFZ</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Floor Space</strong></td>
<td>4956 m²</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Housing</strong></td>
<td>2975 m²</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Commerce</strong></td>
<td>1984 m²</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Actions of Integrated Approach and Area-oriented Approach**

<table>
<thead>
<tr>
<th>Fields of Actions</th>
<th>Urban Level</th>
<th>Project Level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revitalization</strong></td>
<td>Urban strategy</td>
<td>(Macro level) (Site level)</td>
</tr>
<tr>
<td><strong>Remediation</strong></td>
<td>Preparation of categorized contamination, possible uses, remediation costs, and prioritized (risk situation) data</td>
<td>(MV, RC, R)</td>
</tr>
<tr>
<td><strong>Management</strong></td>
<td>Area-oriented initiation of Brownfield development</td>
<td>Area-oriented communication and coordination of Brownfield development</td>
</tr>
</tbody>
</table>

**Effects on the Reintegration (Policies):**

<table>
<thead>
<tr>
<th><strong>Revitalization</strong></th>
<th><strong>Marketability</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated Approach</td>
<td>Upgrade of neighbourhood (green areas, traffic reduction)</td>
</tr>
<tr>
<td></td>
<td>Consideration of Urban Development or Urban Renewal Areas (Funding for demolition)</td>
</tr>
<tr>
<td></td>
<td>Integrated development concept for the site considering the environmental urban conditions on the micro level</td>
</tr>
<tr>
<td></td>
<td>Initiating development processes in the neighbourhood (Rising public awareness, Communication with investor, Marketing)</td>
</tr>
<tr>
<td></td>
<td>Higher possible densities for the site (GRZ, GFZ)</td>
</tr>
<tr>
<td></td>
<td>Integrated remediation procedure (reduction of costs due to reduced risk for existing buildings, security measures, synergetic effects with e.g. cellar or underground parking, reduced amount of contaminated soil)</td>
</tr>
<tr>
<td><strong>Area-oriented Approach</strong></td>
<td>Area-oriented development site specific concept integrated in current development concepts in the neighbourhood</td>
</tr>
<tr>
<td><strong>Remediation</strong></td>
<td>Area-oriented remediation procedure integrated in construction process (no constraints due to existing buildings, increased synergetic effect with e.g. cellar or underground parking, no security measures for neighbouring buildings)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Management</strong></th>
<th><strong>Effect</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated Approach</td>
<td>Area-oriented clean up of neighbouring hot spots and contaminations formerly existing beneath neighbouring buildings</td>
</tr>
<tr>
<td>Active development process</td>
<td>Application of innovative, cheaper and more effective remediation methods</td>
</tr>
<tr>
<td>Transparent, simplified and streamlined development process (authority → authority, authority → investor)</td>
<td>Improvement of Administration</td>
</tr>
<tr>
<td>Application of Project Manager, Interdisciplinary Project Groups</td>
<td>Improvement of Administration</td>
</tr>
<tr>
<td><strong>Area-oriented Approach</strong></td>
<td>Area-oriented development procedure integrated in current development activities in the neighbourhood</td>
</tr>
</tbody>
</table>
## 5. Case Study Stuttgart

### Evaluation

<table>
<thead>
<tr>
<th>Group of Criteria</th>
<th>Criteria</th>
<th>Scenario 1</th>
<th>Scenario 2</th>
<th>Scenario 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regulation and Administration</strong></td>
<td>Influence of policies with preference for inner-urban development</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>(BauGB, 1999), (City Chlor (a), 2011)</td>
<td>Organisation</td>
<td>-1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Communication</td>
<td>-1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Market Value</strong></td>
<td>Status of development</td>
<td>-1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>(WertV, 1988)</td>
<td>Form and extend of structural use</td>
<td>-1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Value influencing rights and burdens</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Legal status of fees and cessions</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Standby time for structural or other utilizations</td>
<td>-1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Composition and character of the land property</td>
<td>-1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Location</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Reclamation Costs</strong></td>
<td>Demolition</td>
<td>-1</td>
<td>1¹</td>
<td>1¹</td>
</tr>
<tr>
<td>(difu, 2006)</td>
<td>Remediation and Disposal (including costs for future observations)</td>
<td>-1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Risk</strong></td>
<td>Stigma and marketing risk</td>
<td>-1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>(REFINA, 2011)</td>
<td>Risk of investment</td>
<td>-1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Risk of usability</td>
<td>-1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Risk of utilization</td>
<td>-1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Sum</strong></td>
<td></td>
<td>-12</td>
<td>9</td>
<td>14</td>
</tr>
</tbody>
</table>

¹ It is assumed that demolition costs are fully or partly funded due to Urban Renewal Area.
7. CONCLUSION
7. Conclusion

- Application of Integrated and Area-oriented Approach can increase Marketability
  → socio-economical benefit (Reduction of costs for the public, pushed developments)
- Complex contaminations still require public funding
- Complex planning tasks need comprehensive approaches
- Comprehensive data and adequate administrative structures are needed
- Comprehensive approaches most probably result in additional work
- Political support is of utmost importance → top down → management tool
- Subsequent funding for implementation of advanced administrative structures
- Interdisciplinary administrative procedures have to become routine procedures
- Appreciation and understanding of the opposite as key factor
- New job profiles are needed (e.g. Brownfield Manager)
7. Conclusion

“It is not the strongest of the species that survive, not the most intelligent, but the one most responsive to change.”

(Charles Darwin, scientist)
THANK YOU...
BIBLIOGRAPHY

- **Arcadis. (2011).** *Sanierungsuntersuchungen zur Quellsanierung.* Umwelt. Stuttgart: Amt für Umweltschutz


