



D.T3.4.1 REPORT ON THE PILOT ACTION WITHIN INTEGRATED ENVIRONMENTAL MANAGEMENT IN LEIPZIG FUA

Increasing Ecological Quality of Pilot Areas

Version 1

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1. Introduction to Pilot Projects in LUMAT Leipzig

The title of the following deliverable has been changed as according to the LUMAT Application Form. The previous title was listed as being “Report on the pilot action within integrated environmental management in Leipzig *Nordraum*”, the deliverable is now titled “Report on the pilot action within integrated environmental management in Leipzig *FUA*”.

The name change reflects the project progress in expanding the area of implementation from only the northern region of the Leipzig functional urban area to now include all partner cities of the existing Green Ring of Leipzig organization. The city grouping is:

- 1) More representative of the Functional Urban Area concept as foreseen in the beginning of the project.
- 2) Covers a wider range of municipalities.
- 3) Connected to an existing agency which can be connected to the goals of the project.
- 4) Support of an existing intercommunal area management of sustainable actions.

The Green Ring of Leipzig will be supported by LUMAT in activities to further develop sustainable land management by the project results. The LUMAT Pilot Actions can be seen as a result of the Action Plan for the Green Ring of Leipzig and are pilot applications for environmental compensatory measures on brownfield sites. The actions are to permanently strengthen the status of the Green Ring Leipzig and prevent the further destruction of soil in the area. LUMAT was able to organize and communicate this information to stakeholders through new solutions to make a change happen.

Different types of brownfield sites with various property rights and structural problems were selected in the project. The pilot examples show the type of experiences and common problems concerning brownfield areas today. Issues of ownership are particularly problematic. Further, the high acquisition costs for sites were identified as an obstacle. In order to be able to apply for and receive funding that would be used for brownfield revitalization, the purchase of at least part of the site in question is necessary. The example in Böhlen shows a special type of problem; bombing during the Second World War brought about large amounts of toxins to the site, including oil and benzene from damaged tanks and boilers into the soil and groundwater. The resulting environmental and pyrotechnic hazards make a profitable reuse, for example as a new residential area, impossible to realize. In Großsteinberg and Leipzig, with the support of the Free State of Saxony, pilot projects are already being advanced in part thanks to the information gathered and presented through LUMAT. The pilot case study in Taucha is an example of a site where various owner interests or unresolved property relations hamper direct implementation. The LfULG together with the Central State Agency for Land Management (“Zentrale Flächenmanagement Agentur des Freistaat Sachsen”) supports the municipalities in the development of solutions beyond the duration of the LUMAT project.



2. Integrated Environmental Management in Leipzig FUA

The path of integrated environmental management in the Leipzig FUA was one of a multi-layered approach. Stakeholder management, Start-Up Plans for the revitalisation of brownfields as well as pilot actions are three of the aspects that have come into combination for the project. Supporting all of these aspects is the LUMAT Tool “LUMATO” which combines the information into one platform for the revitalization of threatened land. Each of these is detailed further below.

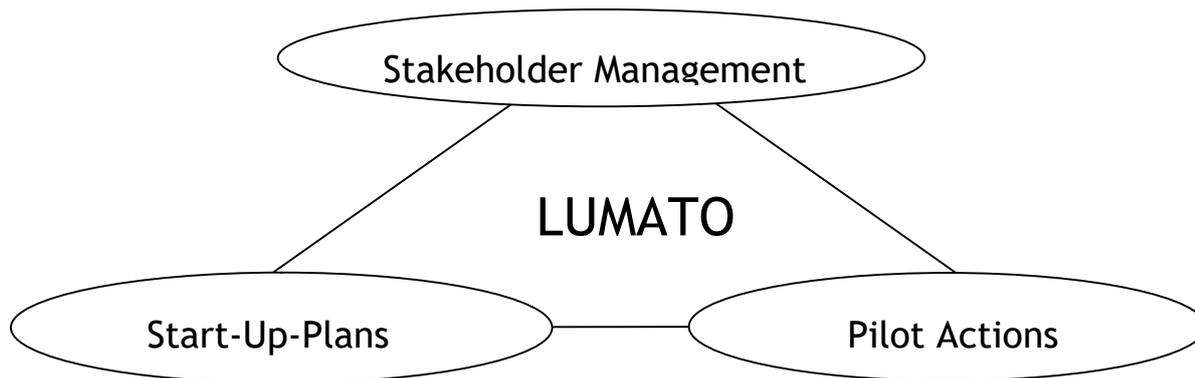


Figure 1. Combination of aspects which have come to define project implementation in the LUMAT FUA Leipzig area. Stakeholder Management, Start-Up-Plans and Pilot Actions are all supported by LUMATO.

3. Homogenization through Tool Integration: LUMATO

A standardized tool for the collection of integrated environmental management information as well as the management of the various interests of stakeholders has been created for the LUMAT project - LUMATO! LUMATO is to be understood as a direct result from discussions with stakeholders in the FUA and the needs they have expressed for carrying out integrated environmental management, the information required for the creation of pilot actions as well as the efficient organisation of information for Start-Up Plans in a geo-referenced tool. In short, the relevant pilot project initiating information, stakeholder needs for management, as well as a template for vision generation on brownfields have been brought together with the tool.

4. Stakeholder Management

The interest of stakeholders must be harmonized in the process of brownfield regeneration. Sustainable land use in the region by addressing threatened sites must be done in cooperation with the individuals who have an involved interest. The LUMAT project activities in Germany for example have coordinated and discussed with the following stakeholders in the area:

- Representatives of regional sectoral agencies such as the Central Land Management Agency for the State of Saxony (ZFM)
- Representatives of the regional governance level such as:
 - Saxon Ministry for Environment and Agriculture
 - Multiple departments of the Saxon Office of Environment, Agriculture and Geology
 - Saxon Internal Ministry



- Representatives from the City Administration of Leipzig including:
 - Technical GIS experts
 - Brownfield revitalization representatives
 - Members from the climate protection department
- Members of the Green Ring of Leipzig Organization including the representatives from the 12 municipalities surrounding the City of Leipzig.
- Higher education and research organisations including:
 - German Association of Soil
 - Technical University of Freiberg
- The general public, property owners and companies operating next to brownfield sites

By communicating with all of these various groups, the necessity for integrated environmental management was able to be made clear to all of the parties involved. The methodology proposed by a Start-Up Plan was considered to be the adequate platform for gathering information.

5. Start Up Plan for Brownfield Regeneration

The concept of Start-Up-Plans for the reuse of brownfield pilot sites in LUMAT originates from the ideas presented in the report “Start-Up-Plan”¹ created by the German Ministry for Education and Research (Bundesministerium für Bildung und Forschung) in cooperation with US EPA in 2005 and from the results of the Circular Flow Land Use Management (CircUse Germany, CE -Project 2013)². The various interests of stakeholders and existing information on the sites in question are gathered with dedicated chapters in the frame of a Start-Up Plan. This information and the various presented interest are then evaluated for making known the potentials for brownfield regeneration. The visions to be achieved with brownfield regeneration projects are detailed in the plan to motivate the relevant stakeholders and to increase the chances of project being successfully carried out.

The aspects to be considered in the creation of start-up plans for brownfield regeneration range from:

- Developing a vision for the new use of a site, including the requirements of planning processes for the implementation. For example, LUMAT envisions brownfield regeneration for the purposes of increasing ecosystem services which are provided by soil and land.
- The legal requirements which are connected to each individual site are these for the dealing of contamination in the soil or the aspects of deconstruction which are to be carefully considered for each project so that new building activities can take place.
- Economic aspects such as a market analysis for the suggested new use and potential risks (including risk management) and the expected comparison of cost versus revenue from project forms.
- The consideration of cultural and social aspects in the brownfield site regeneration for the creation of a better living environment through the planned activities.

¹ Ferber, U., Barczewski, B., Prueß, T., Schrenk, V., Steffens, K., Weber, K. (2005). „Start-Up Brachfläche“ Arbeitshilfe zur Erarbeitung von Projektplänen“. Bundesministerium für Bildung und Forschung (BMBF). Available under http://www.iws.uni-stuttgart.de/publikationen/vegas/STARTUP-Arbeitshilfe-2005_Brachflaeche.pdf (German language with English Abstract)

² LfULG: Circular Flow Land Use Management “Flächen im Nutzungskreislauf” <https://www.umwelt.sachsen.de/umwelt/boden/21288.htm>



The successful coupling of this information and the communication to those involved in the process of making it a reality can increase the effectiveness and impact of brownfield regeneration projects.

Pilot projects are able to be started quickly using the Start-Up Plan methodology. Examples of this in the FUA of Leipzig are given in the next sections.

6. Pilot Actions for Compensation Measures on Brownfield Sites

With the project, the question of achieving integrated land management on threatened sites was a central goal. To demonstrate how brownfield sites could be better managed for integrated environmental management, the concept of Start-Up Plans was applied to pilot sites in the Green Ring of Leipzig.

The benefits of Start-Up Plans are clear when adapted to pilot projects. Stakeholder management was a key activity for the pilot actions. With start-up plans, integrated environmental land management decisions are easier for stakeholders to accept because of the gathering of the relevant information to the sites in a central, easy to read plan. The presented interest can then be effectively compared to one another. Through LUMAT Start-Up Plans, stakeholders were able to be convinced of the benefits for integrated environmental management and the improvement of ecosystem services on site examples.

Pilot projects of the visions defined in the Start-Up Plans are to be understood as the mid-term goal as aimed for by the LUMAT project. Change is to be achieved on select sites to showcase how integrated environmental management can be implemented. The final long term goal is the potential establishment of integrated environmental management on the level of the Leipzig FUA. The Start-Up-Plan offers a template which can be carried out to other sites in the entire region. The potentials to carry out such integrated environmental management would be realized on multiple sites across jurisdictional borders.

6.1. LUMAT Germany Pilot Actions

6.1.1. Großsteinberg

Großsteinberg is located about 30km southeast of Leipzig city center. Being within close proximity to the motorway junction A38 / A14, forests, lakes and quarries, the municipality is suitable as a recreational area. The Start-Up Plan information has been presented together in a report which was used to activate stakeholders to start revitalization activities on the site.

The brownfield pilot site was a former pig sty and is currently an abandoned brownfield. About one fifth of the total site area of 48.000 m² is occupied by buildings and the associated open spaces. The remaining four fifths (about 37.000 m²) are farmland. All buildings are in a ruinous condition and are not sufficiently secured against trespassing. The land use plan designates the majority of the area for agriculture, the built-up part as a commercial area and the most eastern part as an "area with special structural provisions".

The former pig farm is located in an agricultural surrounding, which is loosened up by neighbouring forests and track-accompanying woody plants. The ruinous development and the lack of security of the property, represent visually and in reference to building regulations constitution an instance of misadministration. This must be remedied first.

With regard to the large-scale landscape references, the agricultural part can remain in this use and the building stock of the former pig farm has to be demolished. This requires the preparation of a demolition and disposal concept. This should be agreed with the lower waste and soil protection authority of the district. This creates an available open space that could be used both as an ecological compensation area and alternatively through a solar energy system. Alternatively, the built-up area could also be used for agricultural purposes. The aim is to integrate the site into the green space development of the Green Ring

Leipzig. Furthermore, the site should be used as an ecological compensation area and biodiversity should be strengthened.

In 2018 the carrying out of the actions for reaching the goal for the re-cultivation and the creation of a compensation site has begun. This includes the de-sealing of the site to increase the ecological services provided by the soil. For this, the existing sty structure is to be deconstructed (see Figure 2). It is aimed for to reach an agreement about the property ownership rights with the relevant stakeholders. The concept for deconstruction and the disposal was created by an expert consulting office and has been submitted for approval by the managing authorities. The contractual agreements are currently being worked out and the action is expected to be completed in the year of 2019.



Figure 2. Inside the Großsteinberg brownfield located on the site. (Source: ZFM, 2018)



Figure 3. The surroundings of the property. (Source: StadtLand, 2018)



Figure 4. The surroundings of the property. (Source: StadtLand, 2018)

6.1.2. Fuchshain

Fuchshain is located about 18 kilometres southeast from the city centre of Leipzig and is part of the city district Naunhof. The brownfield site which is being considered by LUMAT in the area is owned by the State of Saxony. The roughly 5,000 m² site is adjacent to the S43 motorway and is secured against trespassing by a gate. Part of the site was used as a storage site for street building materials. The site is raised on average about 2 meters above the surrounding land due to the previous storage of gravel and soil materials on the site. The site is partially covered in vegetation and the soil is not of a natural quality. There are various parts of the site which have been artificially covered in gravels or concrete.

The Central Agency for Land Management in Saxony has taken the aspects of land recycling as presented as part of the integrated environmental concept in the project and the Start-Up Plan created for the site. The site is not able to be used for urban use due to its hinterland location and for this reason should instead be used as a compensation site. This can enrich the surrounding agricultural landscape and strengthen the ecological function of the surrounding green axes of the Threne. A design from LUMAT which improves the landscape can be done as a type of compensation action according to section 15 of the federal nature protection law (BNatschG). After an initial evaluation of the site, the surround areas of land which are not sealed can be left to the succession of nature and the central sealed areas can be partially de-sealed and ecologically improved.

Stakeholder activities as of the date of writing this deliverable include the agreement for upgrading the site for the purposes of carrying out an environmental compensation measures on the previously built piece of land by the Central Agency for Land Management. The site in Fuchshain is to be integrated into the green space development of the Green Ring of Leipzig. The surrounding agricultural uses are to be supported and upgraded through this activity as well.



Figure 5. The brownfield site in Fuchshain. The soil has been partially covered and the natural ecosystem services are disturbed. (Source: StadtLand, 2018)



Figure 6. The carrying out of ecological compensation measures on the site will improve the brownfield site and increase the ecosystem services provided by the soil. (Source: StadtLand, 2018)

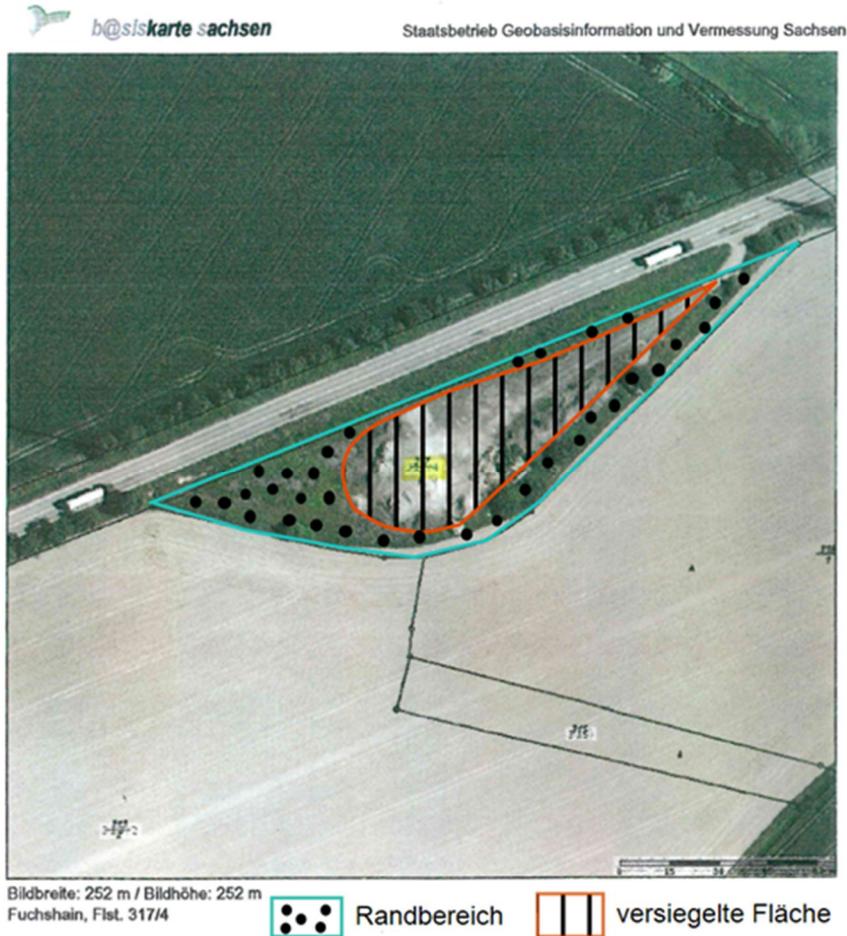


Figure 7. Development concept for the site in Fuchshain which identifies the unused areas of soil sealing for compensation measures. (Source: StadtLand, 2018)

6.1.3. Althen

The integration of the site into the green space development of the Green Ring of Leipzig is aimed for the site in the district of Althen. The site is also to be used as an environmental compensation site and the biodiversity on site is to be strengthened. The site is located on the eastern border of the Leipzig city district of Althen in the outer zone along the Parthe River. The L-shaped property borders in the north-western area along the river. In the southern and western parts of the site the existing green network system of the Parthe starts. The use of this green network however is compromised by the existence of a sewer canal and an electricity line.

The construction of the site is to be refrained from when considering ecological aspects of the site as well as the importance of flood protection and the regulation of the city climate in the area. LUMAT was able to evaluate the green site and especially the riparian piece of land on the site.

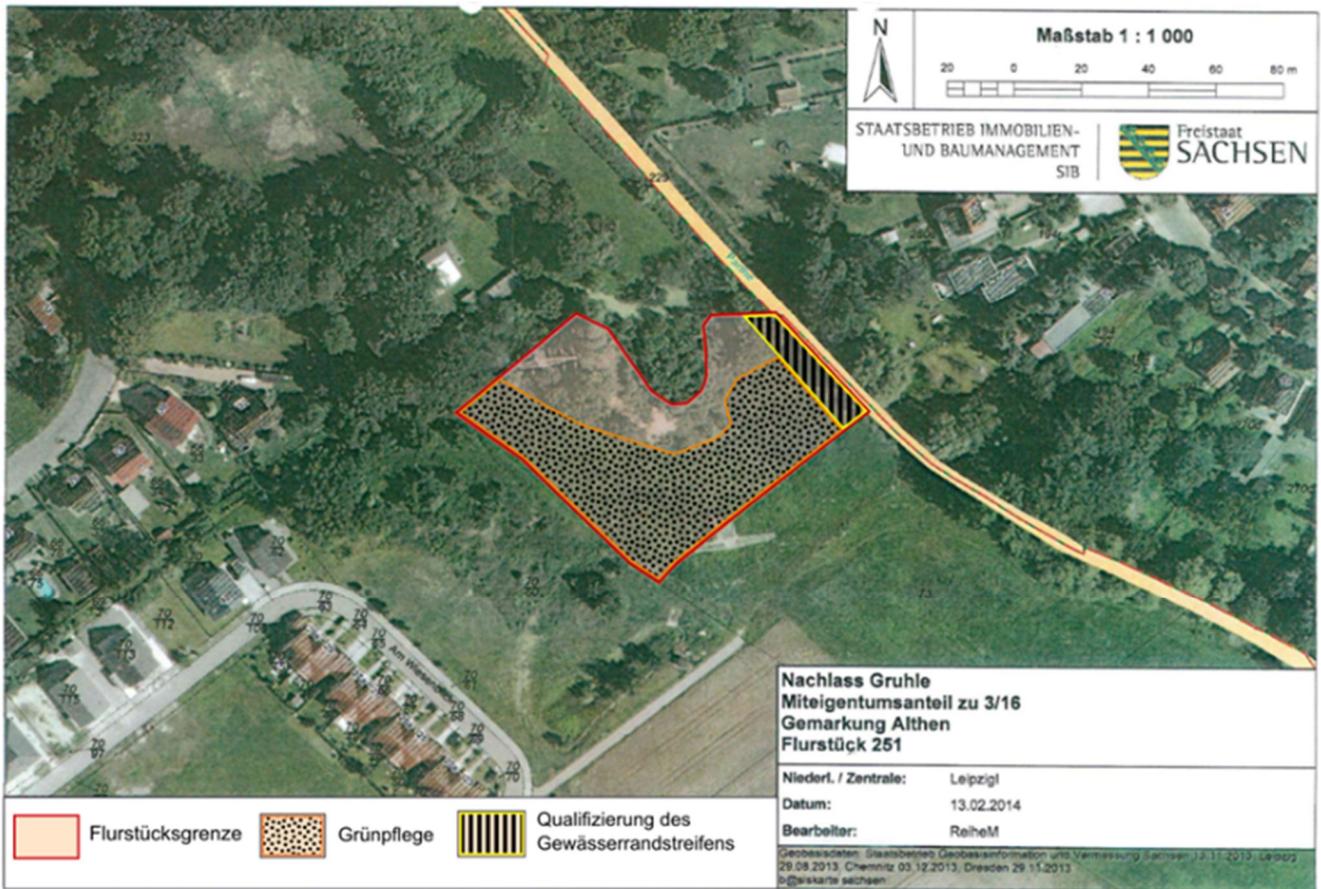


Figure 8. Development concept for the site in Althen. (Source: StadtLand, 2018)

6.1.4. Böhlen

The brownfield in Böhlen is exemplary of the lively commercial and industrial area of the city of Böhlen. The development of this site should follow incrementally and the project is to be adapted to the development goals of the region of Leipzig as well as the southern city area. A mixed use of the building would ensure the feasibility of the future use of the site in the long-term. The goal for the brownfield in Böhlen is:

- Enable the revitalization of the abandoned building structure
- Secure the conservation of the historical structural elements on site.

A use concept was developed for the site in the LUMAT project. The building will be adapted to the previous use as a training centre. In the ground floor of the building, office spaces will be rented out. LUMAT recommends that the owner incorporate the use of commercial and service centre uses with a flexible floorplan option. In addition it is recommended to install a solar panel system on the roof of the main building. Due to the location, connection to the existing infrastructure and the available parking space, it is recommended that the northern wing and the laboratory of the building be deconstructed to realize a new use of the inner courtyard area.

Currently, in agreement with the Central State Agency for Land Management and the city, actions are being planned for the structural securing of the building. The question of how to deal with the existing debt for the property has not yet been cleared.



Figure 9. Streetview of the facade (Source: StadtLand, 2017)



Figure 10. Courtyard and rear view of the building (Source: StadtLand, 2017)

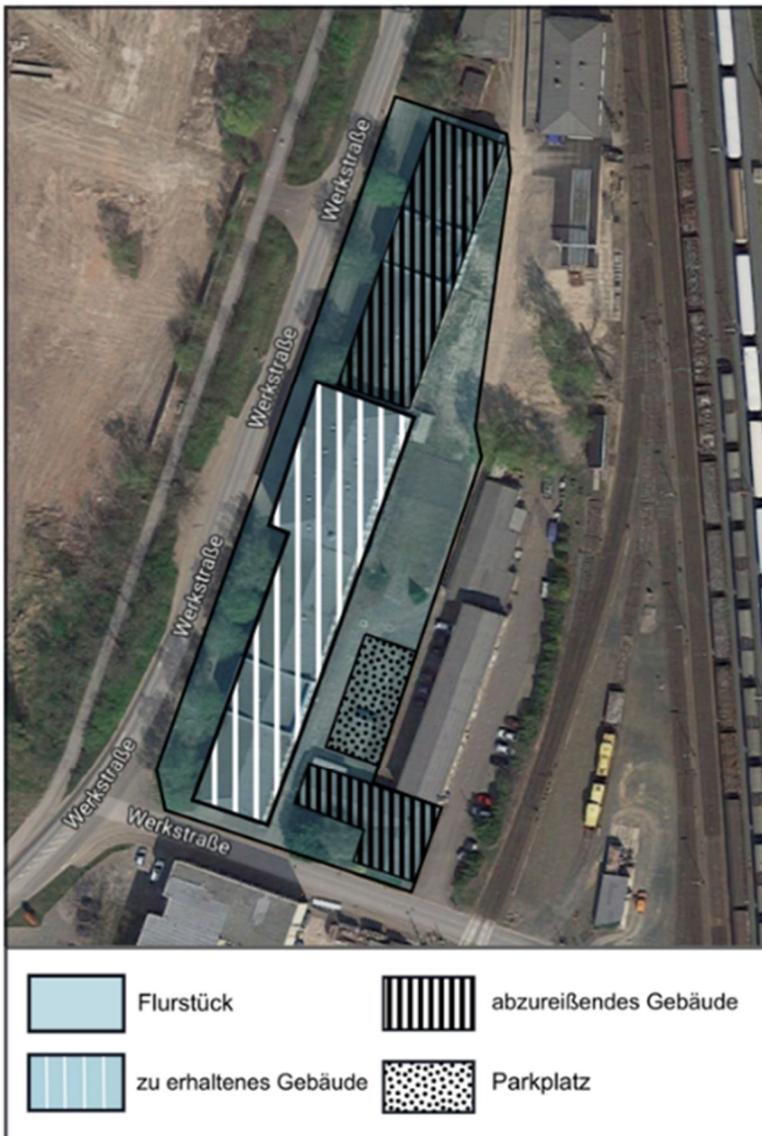


Figure 11. Development and use concept for the brownfield in Böhlen (Source: StadtLand, 2017)

6.1.5. Markranstädt

The identified brownfield in the city of Markranstädt used to be a manufacturing site for hydraulic machinery. Because of this, the contamination of the soil is an issue that has to be further detailed with the revitalization of the site. It is to be studied as to whether the site is to remain sealed for the protection of the groundwater resources. This leads to the potential use of the site for urban uses such as a potential site for commercial and industrial activity. This would minimize the construction of such new uses on greenfields in the peri-urban locations of Leipzig and would reactive the brownfield site, thus successful land recycling.



Figure 12. The brownfield site in Markranstädt and the present soil sealing. (Source: LfULG, 2018)

6.1.6. Taucha

The brownfield site identified in LUMAT is located in the north-eastern part of the Green Ring of Leipzig in the city of Taucha. The site is 1.5 kilometres away from the city centre. Part of the Taucha brownfield identified in the LUMAT project was previously used as clay pit and later as a dumping site, mostly for dug up materials, ashes from coal heating as well as a small amount of household wastes. Since the mid-1980s the site has been abandoned in its current form. There is a neighbouring company “HSK Handels- und Servicekontor” is a company active in the recycling construction materials. A further clay pit can be found in the surroundings as well.

The site is surrounded by agricultural uses to the north and west as well as a green space. The site is located partially in a nature protection zone with a special status for the protection of birds, as well as has the designation as a former deposition site with specific degradation of the soil resources. These sites are part of the landscape protection area “Parthenau-Machern”. The aim for the revitalization of the site is the integration of the site into the green space development of the city of Leipzig, as well as the neighbouring landscape protection zone. The use of a part of the site for agriculture production can continue its use. The neighbouring commercial use should be secured with the option of using part of the brownfield site as an expansion site. The areas which have already been changed into areas for succession vegetation on the former pit area shall continue to contribute to the biological diversity of the site. The site does not have an identified owner and has a debt of about 2.1 million Euros.

Aspects of the soil characteristics as well as potential contamination of the commercial uses as well as those of nature protection are to be considered when planning the future use of the site. Based on the initiative of LUMAT, changes to the land use plan have been made in cooperation with the city administration of Taucha and two development options have been presented:

- Commercial expansion site for the neighbouring company Rösl



- Site for a new commercial use. This would require a new connection to the existing infrastructure systems of the city.

In the LUMAT project, the first option has been discussed as a more viable option worth pursuing.



Figure 13. Northern portion of the brownfield site in Taucha (Source: StadtLand, 2017)



Figure 14. Southern portion of the brownfield site in Taucha (Source: StadtLand, 2017)



Figure 15. Aerial image of the brownfield in Taucha. (Source: [google.de/maps](https://www.google.de/maps), retrieved 17.10.2017)



Figure 16. Part of the soil heap existing on the site (Source: StadtLand, 2017)



Figure 17. View towards the neighboring commercial use from the brownfield site (Source: StadtLand, 2017)

6.1.7. Leipzig

The final LUMAT pilot site is located in the Leipzig district of Seehausen, which is part of Göbelschelwitz. The brownfield is a built up former agriculturally used site with some barns still present for the holding of animals. The site is owned by the city of Leipzig which aims to create a compensation measure on the site. Housing uses as well as agricultural uses surround the site. There are four barns for animal housing on the site and one of these is still currently in use. The majority of the adjacent land is sealed with concrete slabs.

Due to the adjacent residential uses, the continued use of the site as an agricultural site would create land use conflicts. The surrounding agricultural sites are lacking in biodiversity. The interests of the city of Leipzig to create a new ecologically improved site as well as those of the surrounding community are to be considered to help determine the best after use for the common good. The LUMAT Start-Up Plan for the site details out the benefits of the deconstruction and de-sealing of the site for integrated environmental management.

According to the evaluation completed in the LUMAT project, the existing buildings as well as the sealed soils on the site are all to be deconstructed, with the exception of the building still being used on the site. After deconstruction the greening of the site as an environmental compensation measure is to be prepared. The later use of the site is especially important in this context. In order to reach the aimed for goals of compensation on the site, the use of the site as an agricultural use, as an orchard or a combination of these two uses are in principle possible.



Figure 18 View of the brownfield (Source: StadtLand, 2017)



Figure 19. View of the brownfield and sealed sections of the site (Source: StadtLand, 2017)

7. Lessons Learnt for Integrated Environmental Management on the FUA Level

The testing of the Start-Up Plan as developed on the federal level and tested in the Leipzig FUA level in the LUMAT project has proven to be successful for the purposes of integrated environmental management. The various interests of stakeholders have been combined in the documents and the steps to achieve more liveable places made clear through concrete visions on existing sites. The needs of existing stakeholders and their institutions have been taken into account as well and combined. The standard use of the Start-Up Plan template for multiple sites in the FUA area has proven to be effective for the initiation of projects that bring results.

Integrated environmental management means the evaluation of wide ranging information. LUMATO allows for the georeferenced storage of this wide range of information and thus allows for an improved consideration of various environmental aspects. The coupling of information from spatial planning databases was gathered in the frame of LUMATO to include also the information from other stakeholders. Potentials in the revitalization of land are the direct result of the comparison of all the information in LUMATO. This information can be organized for the creation of Start-Up Plans as exemplified by the LUMAT project. With the pilot projects, it has been shown which information is needed to carry out projects in the region of Leipzig with the identified stakeholders. By identifying and adapting these aspects, the methodology could also be helpful for other regions as well.

The LUMATO is to be used as a decision support system, not to determine the direct end use of threatened sites. Instead this must follow from the local planning authorities and those willing to make financial investments for the projects. Further evaluation could be made in trying to quantitatively define how ecosystem services are to be improved through the revitalization of land.