

# Dortmund

## and its Green Infrastructure

# Front Runner City

### Industrial Heritage

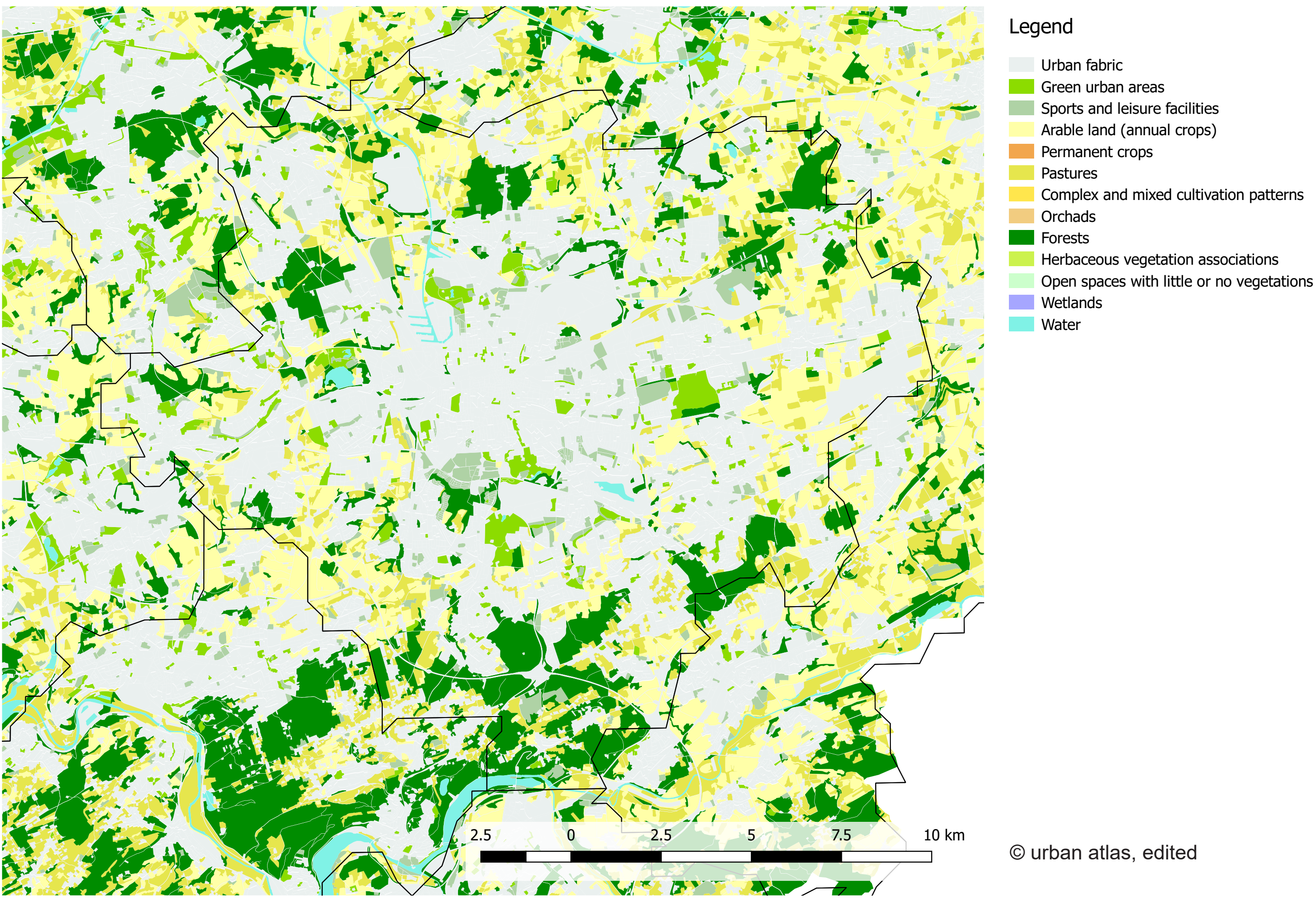
In the 19th century Dortmund as part of the Ruhr region became a strong economic centre for coal, steel, and beer production and a melting pot for immigrants. During World War II the city centre and the coal and steel industry areas were almost completely destroyed. In the 1950's the traditional industry regained strength, but declined from the 1960's. In 1987 Dortmund's last coal mine closed, in 2001 the last steel mill. Within two decades more than 80 000 people lost their jobs.

Early on, Dortmund started to create a new economic base and to diversify its industrial infrastructure. In 1968 Dortmund opened its university. Today, together with other public and private universities Dortmund offers a wide educational spectrum thus generating a highly educated workforce which is an important base to manage structural change. Within few decades Dortmund has changed from a traditional coal and steel town into a modern tertiary centre with a diversified industrial structure, strong in logistics, informatics, biomedicine and microsystems technology.

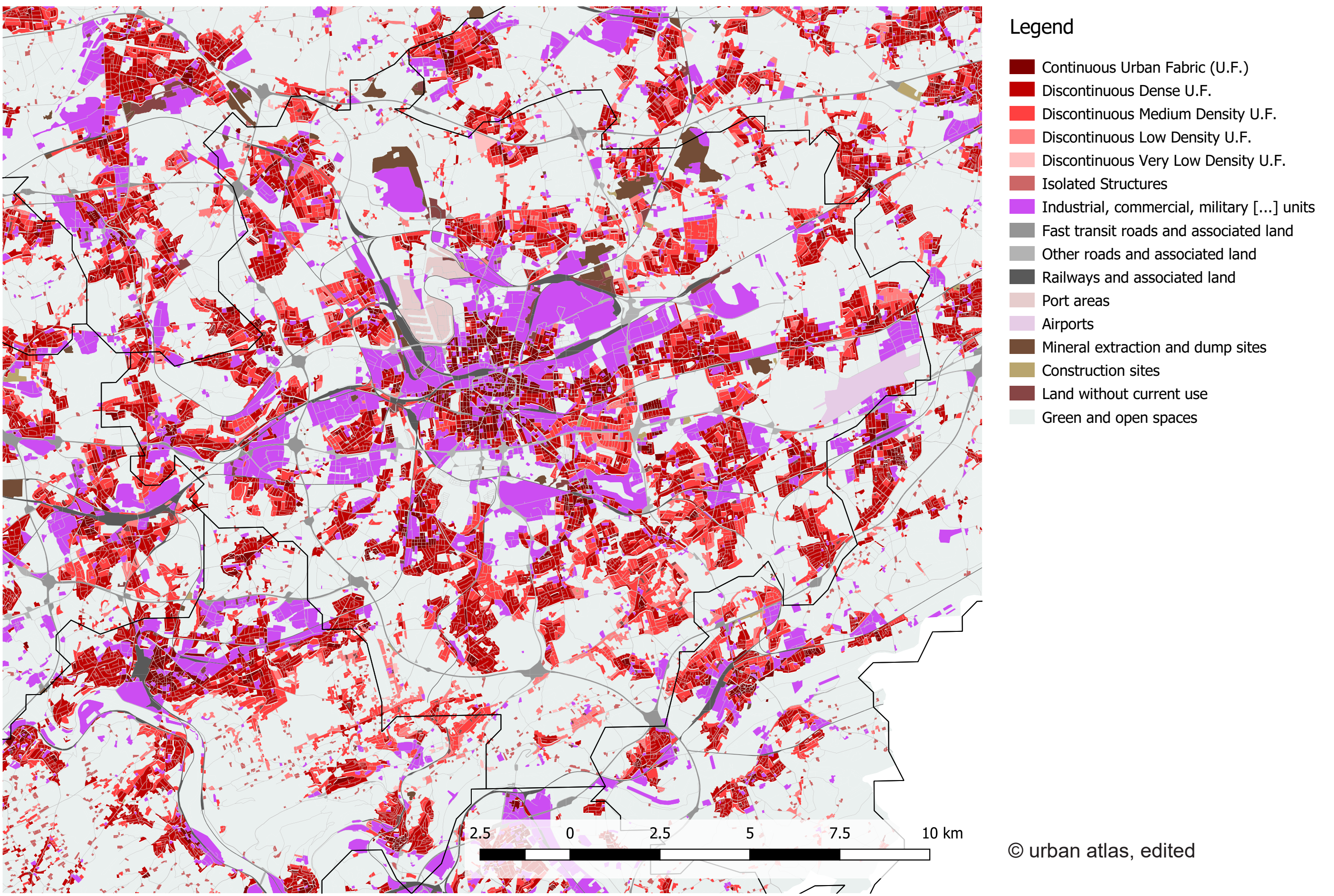
With its economic and structural change, Dortmund as well has changed its visual appearance from an industry city to a modern centre with a high quality of living. Former industrial sites have been reused for industry, living, and green infrastructure. This process is still ongoing, causing decline and chances for urban development at the same time. Over the past decades the city has managed to connect green spaces thus creating a green, attractive recreational network. It combines large parks with green areas along rivers, on former industrial sites or railway lines thus giving the opportunity to walk or bike over longer distances within green corridors. Today, Dortmund is Germany's 8<sup>th</sup> largest city with more than 600.000 inhabitants, moderately growing and attracting again young families to move in.



### Green Infrastructure



### Regeneration Challenges



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PHOENIX Lake with its adjacent park and housing areas has become one of Dortmund's favorite leisure areas on a former steel works site. The lake also serves as a retention pond.



© Stadt Dortmund, Dagmar Knappe

Railway tracks, formerly connecting montane areas, nowadays serve as a network of green corridors, attractive for hiking and biking.



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The 400 ha area of Westfalenhütte, a former coking plant and steel works, is currently under a step-by-step reconstruction. Next to already existing steel manufacturing industries and research institutes it will be a place to settle further logistics companies in the near future.



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Dortmund has numerous residential areas built around 1900 for former workers of the coal and steel industry which nowadays need renovation. As its residents are socially underprivileged public money is needed to renovate these areas. Currently, Dortmund has 11 urban renewal areas.



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Westfalenpark with its landmark TV tower "Florian" is located 2 km south of the city center. It has been the location of two former national garden exhibitions, is a popular park and a well-known place for concerts and exhibitions.



© Stadt Dortmund, Susanne Webeling

The 45 hectares large area of Hoesch Spundwand, a former steel works, is abandoned since 2015. Numerous challenges like contaminated soils or financing models need to be solved, but give chance to upgrade a devastated urban area into an attractive place for living, working and recreation.

Thanks for contribution to: Dagmar Knappe







# Dortmund

## as a Living Lab

# Front Runner City

### Living Lab area

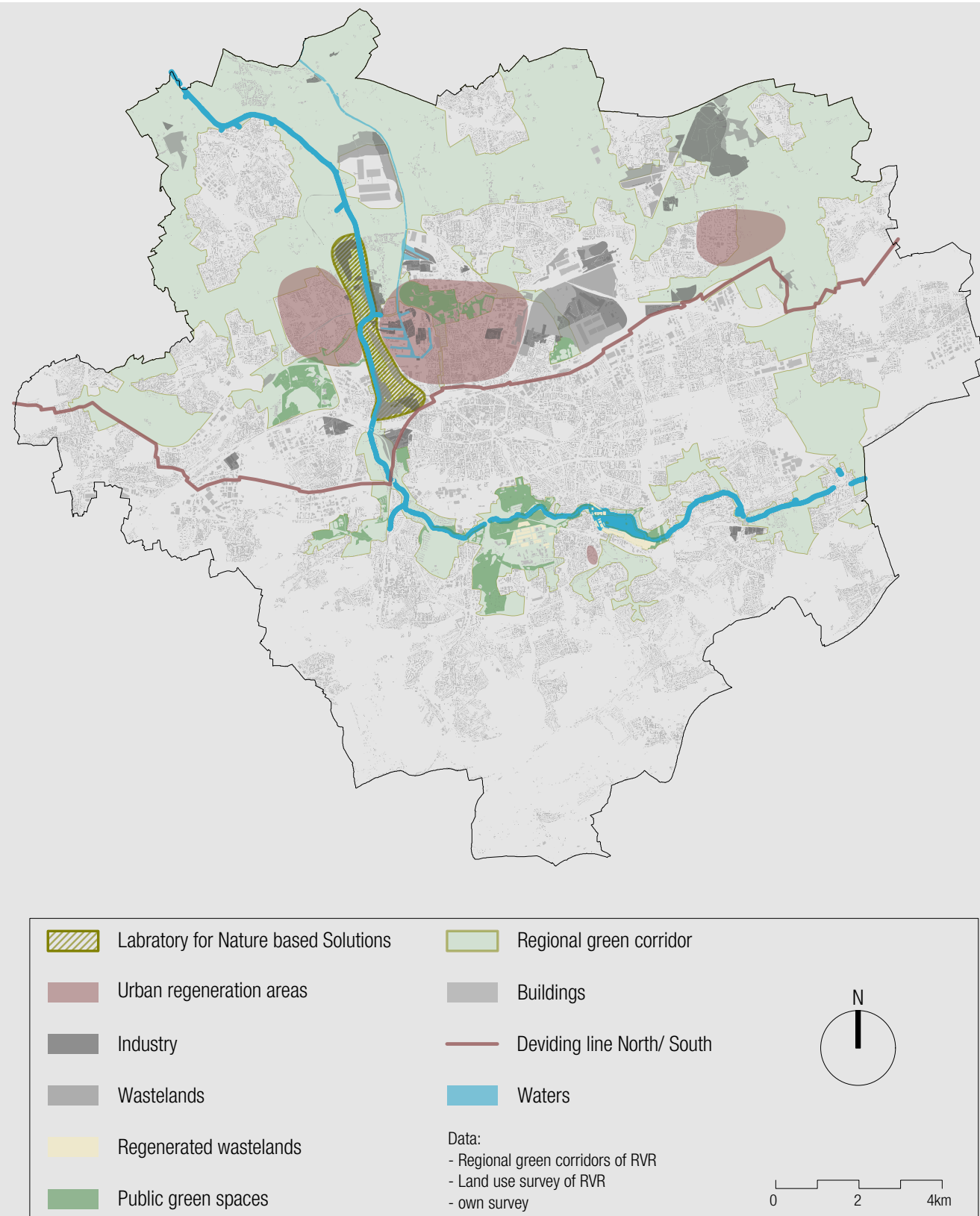
Dortmund's Living Lab extends along the Emscher river for about 5 km mostly as a narrow belt. Here, the river is flowing about 2 km west of Dortmund city center in south-north direction between Dortmund-Dorstfeld and Kokerei Hansa.

The Living Lab encompasses about 215 ha and embraces mostly urban green spaces, except the 10 ha area of Kokerei Hansa in the north and the abandoned steel factory HSP in the southeast (45 ha).

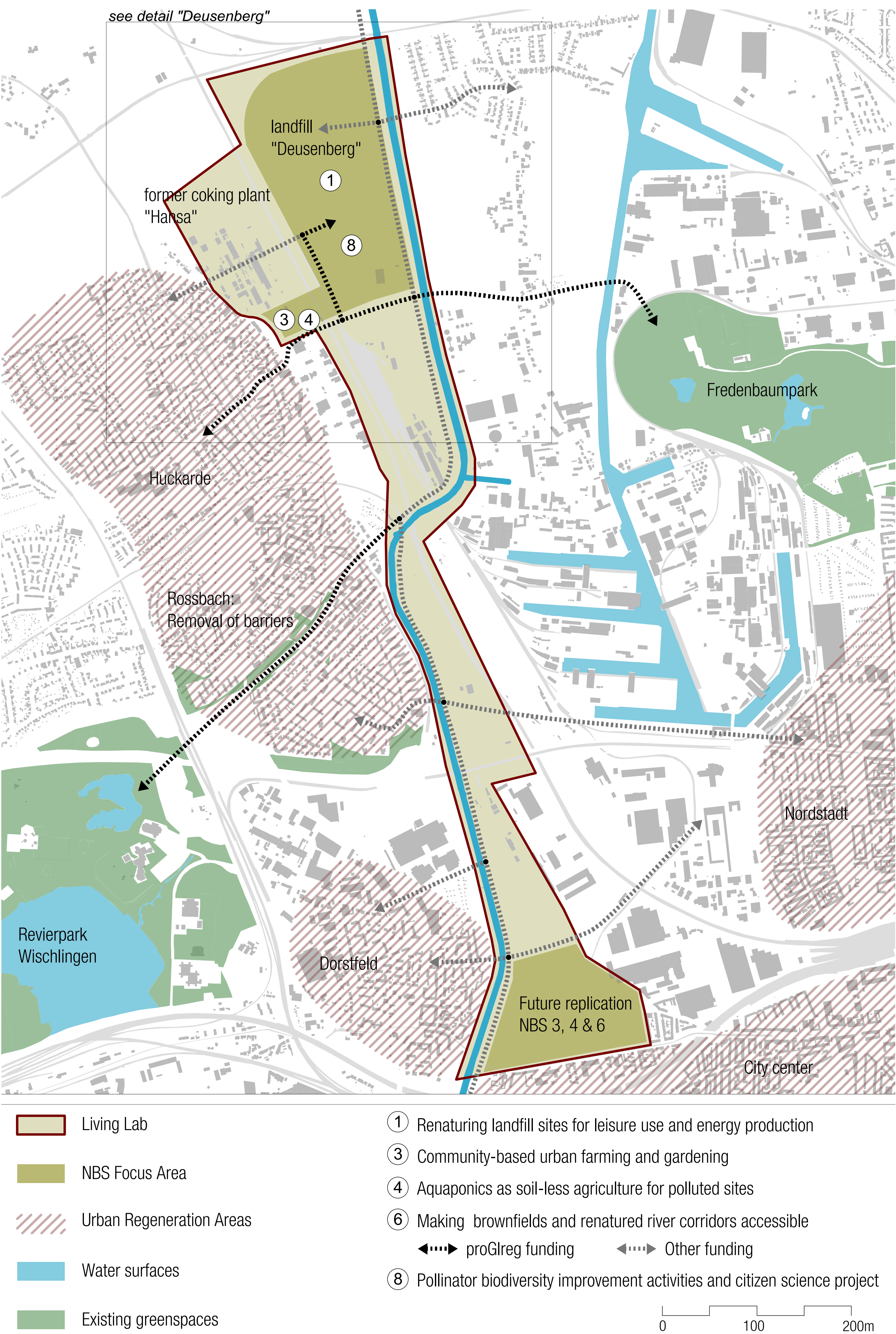
For almost 100 years the canalized 83 km long Emscher has been the Ruhr area's wastewater sewage. Due to land subsidence caused by coal mining it was not possible for long to build an underground canal system. East of the Emscher a 45 ha large area had been filled with waste. In 1926/ 1927 east of Dortmund-Huckarde Kokerei Hansa had been constructed.

Today, Kokerei Hansa is one of Dortmund's most important industrial historic relicts and a famous museum for industrial heritage within the Ruhr region. The former waste dump Deusenberg has piled up to a 50m elevation and since 2004, it is a leisure place for mountain bikers and a popular destination for promenades. In 2016, a 3,5 megawatt solar plant has been installed on top of the mountain.

The Living Lab is close to two populated Dortmund districts: Dorstfeld in the south and Huckarde in the north. Due to the Emscher river, adjacent large streets, artificial dams and noise protection walls it is isolated and hardly integrated into urban structures or pathway systems. Both neighbouring urban quarters are socially underprivileged and therefore have gained special attention regarding urban development in past years. For Dortmund-Huckarde an urban development plan is currently at work. Most brownfield sites have been cleaned, nevertheless, the area is more or less completely anthropogenically influenced.



### Living Lab Plans



Dortmund will concentrate on the following nature-based solutions, situated mainly in the northern part of its Living Lab:

**NBS 1+6:**  
Integrating solar energy production and sport activities on Deusenberg to strengthen its attractiveness as well as connecting Huckarde with renatured Emscher and Deusenberg to improve accessibility of different points of interest.

**NBS 3+8:**  
Creating 1 ha food forest and permaculture orchard in combination with pollinator biodiversity together with Huckarde residents to establish productive green infrastructure close to residential housing and to increase native plant variety.

**NBS 4:**  
Establishing a community managed 200 m<sup>2</sup> aquaponics system to figure out technical ways to run these systems economically and involving Huckarde citizens.

Intention is to improve social, economic, and environmental qualities simultaneously via these measures. In order to establish sustainable effects, the involvement of the adjacent population and strategic stakeholders is important.

Dortmund Living Lab overlaps with other ambitious community based development plans:

- International Garden Exhibition (IGA) 2027: The Living Lab will be part of Dortmund's "future gardens" focusing on the question "How do we want to live tomorrow?" and attracting considerable amounts of money for further infrastructure investments supporting to attract the green corridor

- Urban development plan "Dortmund-Huckarde" to improve living conditions (housing and green infrastructure) within the urban district west of the Living Lab

- nordwärts ('going north'): urban development decade project to improve social, economic, and environmental conditions in Dortmund's seven northern districts; the Living Lab is part of this project area

All community plans complement each other's objectives in the Living Lab as part of a long-term urban renewal strategy.

### Current Situation



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Dortmund Living Lab extends as a narrow belt adjacent to noise protection walls, streets, and anthropogenic dams.



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Today, former Kokerei Hansa is a famous museum for industrial heritage in the Ruhr region.



© Attila Toth

Emscher river, renatured







# Dortmund

## and its Focus NBS

### NBS no.4 aquaponics as soil-less agriculture for polluted sites

#### Installation of a community managed 200 m² aquaponics system

The plan is to design, build and run a 200 m² lower tech, low cost aquaponics greenhouse. Aquaponics combines water-based aquaculture and hydroculture into a resource-friendly circulating system. The soilless cultivation system allows usage of areas with poor soil condition or even with contaminated soil, which makes it suitable for food production on post-industrial sites.

The inclusion of local citizens into the aquaponics project is intended. Therefore, the system should be suitable for community investment, community building and community operation.

#### expected benefits:

Vegetables and fish, locally produced in urban regeneration areas in community aquaponics systems can lead to healthier diets, and to community-pride on self-produced nutrition. If scaled to business level, they might also help to create new green jobs and lower dependence on transfer-income.



© die Urbanisten



© die Urbanisten

### NBS no.3 & 8 community-based urban gardening and farming & pollinator biodiversity improvement activities

#### Creation of a 1 ha food forest and permaculture orchard and supporting pollinators with local residents

The plan is to design, plant and run a 10 000 m² community based food forest and permaculture orchard within the Living Lab Dortmund. A food forest is a self-sustaining living woodland ecosystem designed for food production. The plants of the food forest grow in a succession of seven layers, making use of companion planting.

#### expected benefits:

Food forests and permaculture can increase availability of pollinator flora and biodiversity of flora in urban areas. The forest can help to enable education and to raise awareness regarding the topic of pollination and beekeeping.



© Bernd Pölling

# Front Runner City

### NBS no.1 & 6 renaturing landfill sites for leisure use & energy production & improve accessability for local residents

#### Connecting Huckarde with energy and leisure hill Deusenberg

The former landfill Deusenberg is already accessible, but only from its eastern side. Photovoltaic energy production started in 2017. To provide easy access to the popular mountain bike arena and leisure point on top of the hill, new path connections are intended from urban quarter Huckarde west of Deusenberg.

#### expected benefits:

Integration of a so far isolated recreation point into the local path network as well as bringing alternative energy production stronger into mind of the local population.



© Dagmar Knappe



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## Core Stakeholders



Since 2010, die Urbanisten have been combining professional planning strategies with new approaches regarding participation of residents in neighborhood development. In proGReg die Urbanisten will act as a link between science, civil society and administration.



hei-tro develops and builds small to middle scale aquaponic-systems for home and commercial use. At present the company is one of a few ones in Europe offering a complete package of fully equipped small-scale aquaponic-systems labelled CITY-BOTANICALS. The company offers consulting services for self-sufficiency concepts and is involved in construction management of commercial urban agriculture projects.



The Department of Agriculture of the University of Applied Sciences Fachhochschule Südwestfalen is active in teaching as well as national and international research in the field of urban agriculture. Within proGReg FH Südwestfalen is leading WP 5 "Market readiness, barriers and upscaling" and contributing to planning, implementation, and assessment of NBS in the FRC Dortmund.

