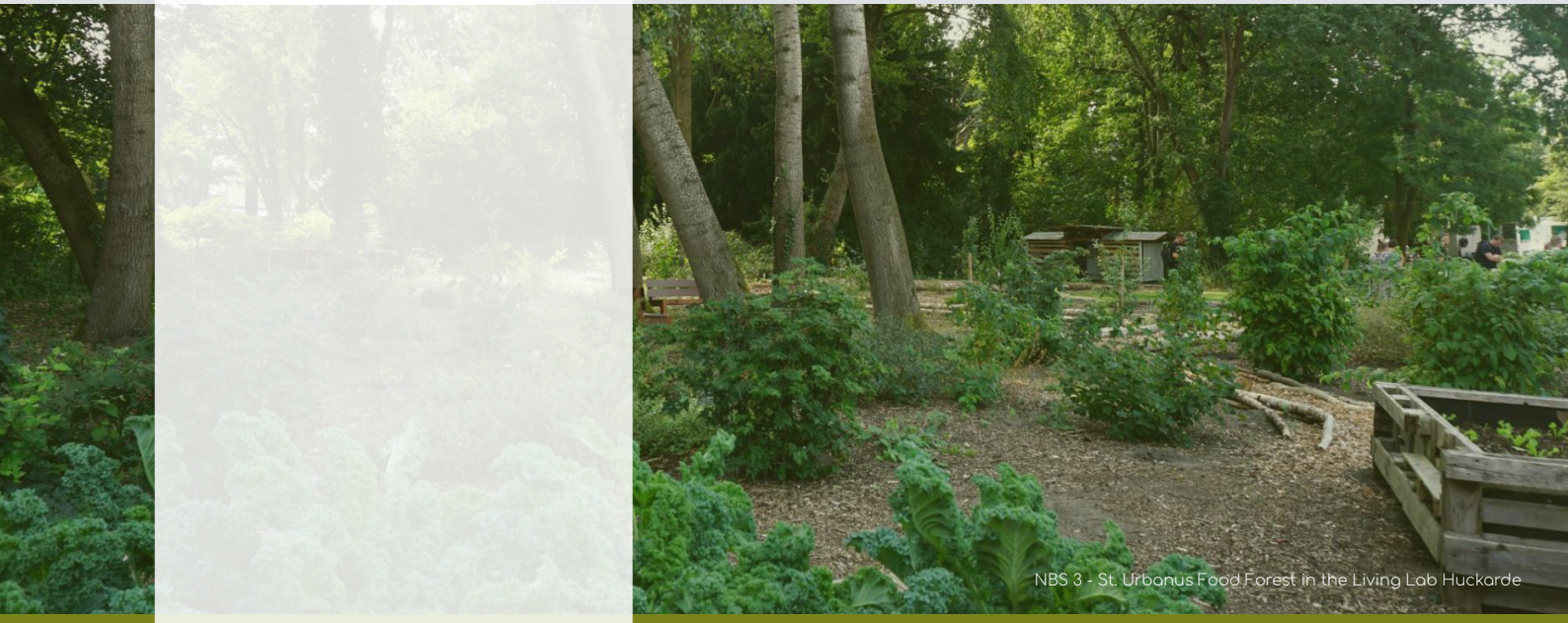
Living Lab Dortmund



NBS 3 - St. Urbanus Food Forest in the Living Lab Huckarde

Stadt Dortmund

Deliverable 3.5
Implemented Living Lab in Dortmund-Huckarde

Dortmund Living Lab Huckarde view from Hansa Coking Plant

Vision, goals and management of the Living Lab

View of Huckarde from the Deusenberg

Vision for the Living Lab Huckarde

Huckarde interconnected by nature! ProGIreg implements green infrastructure and urban farming activities to improve the social situation and to foster identity within Huckarde district. The goal of experimenting with nature-based solutions (NBS) is to achieve sustainability that integrates urban vitality, ecological responsibility, economic prosperity and social justice by involving local communities in the design and management of these projects.

Living Lab Dortmund overview

Dortmund is located in Germany's former key coal mining and steel industry center, counting over 600 000 inhabitants (2022).; the largest city by area and population of the Ruhr Metropolitan area. Just like other cities of the Ruhr region, deindustrialization has forced Dortmund to transform in economic, social and environmental terms. Large-scale contaminated brownfields, former industrial and transport sites need redeveloping.
The Dortmund Living Lab is located in the post-industrial Huckarde district (c. 9.000 inhabitants in 2021), about 4 km Northwest of the city center. The Hansa Coal Mine founded in 1855 and the Hansa Coking Plant in 1928 dominated the settlement, being the most visible and largest local workplace until closedowns in 1980. Deindustrialization (over 10.000 workers lost their jobs within few years) has driven Huckarde into structural change with tremendous economical, social and environmental effects. In response, regeneration programs kick-started in 1992 to strengthen the district as a livable place and enhance the district center. Over the past three decades, Huckarde has developed into an area with solid housing conditions, a good mixture of retail supply and a high recreational value as it is located close to the recultivated Deusenberg landfill, Emscher river path, Dortmund-Ems-Canal and forests to the North and West. Characteristic features are the Emscher river, Hansa Coking Plant (now an industrial heritage monument) and the Deusenberg. A nearly 2 km long park system connects Huckarde with forests North and West including Gustav-Heinemann-Park and two publicly accessible allotment gardens.

Challenges and Goals

Huckarde suffers from weaknesses such as:

- environmental degradation including large-scale contaminated sites,
- former industrial and transport sites,
- lack of high quality green open spaces
- socio-economic disparities: higher share of foreigners and unemployment rates, notably in Mailoh subdistrict.

Significant regeneration projects at regional and district level are ongoing to harness the district's opportunities, making it attractive to a wide range of mixed socio-economic backgrounds. These opportunities play a vital role in transforming the area through successful development projects and the implementation of innovative solutions using nature to transform brownfields and underused spaces.
The proGIreg research project has turned some of the weaknesses into opportunities as strategic starting points for several NBS implementations in the Living Lab Huckarde, adressing social, economic and urban problems. The Living Lab approach entails testing NBS in real life condition by involving stakeholders and citizens at an early stage in co-design and co-implementation processes. The overall aim is boosting collaborative and long-lasting engagement including vulnerable and marginalized groups. ProGIreg NBS use nature for renewal in regenerating pathways and improve land accessibility, e.g. (fig. 2):

- Creating green corridors by connecting already existing paths,
- Transforming privately owned spaces into community gardens,
- Experimenting with collective farming practices as a tool for urban regeneration and social inclusion in several NBS 3 interventions,
- Involving local citizens and scouts to experiment with horticultural activities,
- Developing and testing aquaponics as a sustainable alternative to conventional agriculture by applying social and technological innovation solutions,
- Converting potential urban areas into attractive habitats for pollinators to improve biodiversity.
- Designing, managing and maintaining green infrastructure shared with local businesses, associations and citizens

While the overarching goal of the Dortmund Living Lab is developing a systemic green infrastructure network by improving connectivity and thus enhancing the living and environmental conditions in Huckarde, the long-term goal is to disseminate and replicate these solutions and practices at other locations in Dortmund and national and international cities. Addionally, developing new business models based on sustainable and circular economy solutions and transversal planning tools with the added value of NBS co-creation.

Living Lab Management

The complex organizational, administrative and legal aspects and overcoming financial and implementation constraints required intensive communication with all stakeholders . Establishing a strategic stakeholder network with Huckarde multipliers from civil society, administration, politics and the private sector proved effective for NBS implementation (fig. 1). A steering committee mediated internal cooperation issues. Any works had to comply with resolutions of the local Huckarde parliament, i.e. movement park (NBS 1) and Deusenberg foot path (NBS 6) by mandating the Department of Urban Renewal.

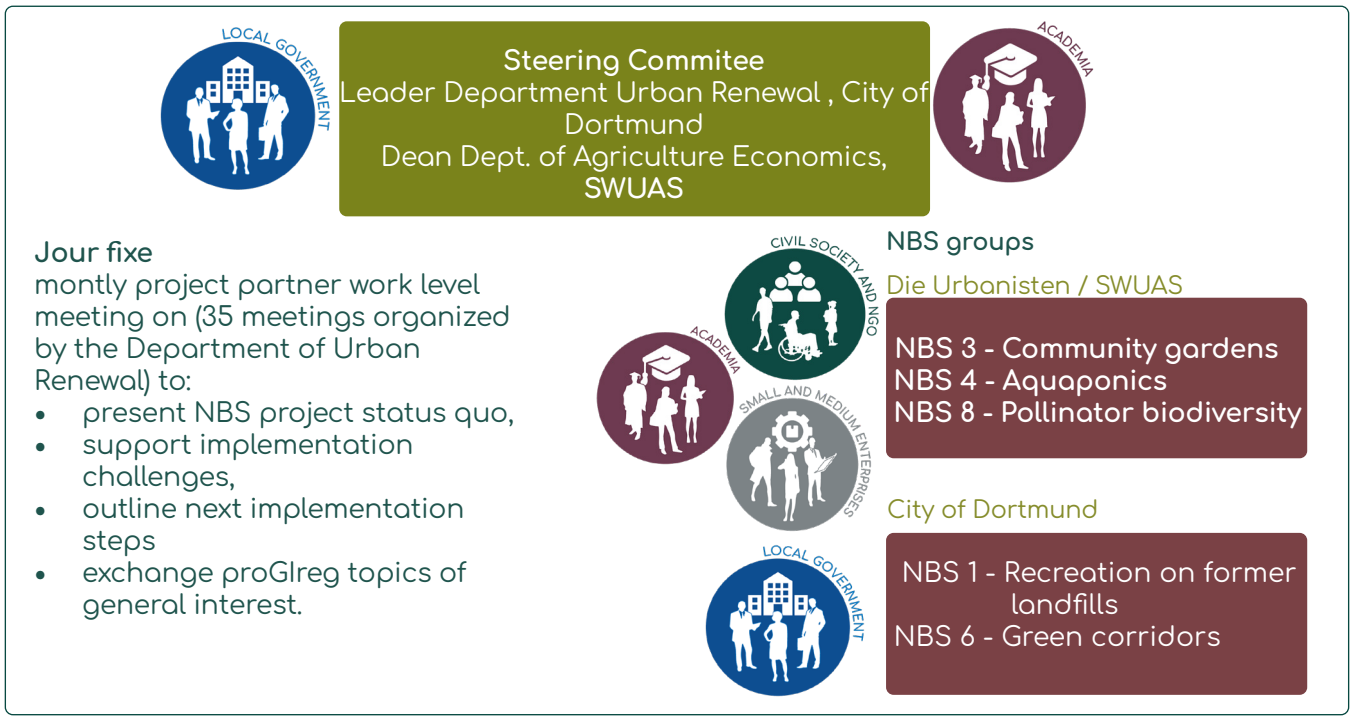


Figure 1: Living Lab management structure

Co-design activities to implement proGIreg NBS

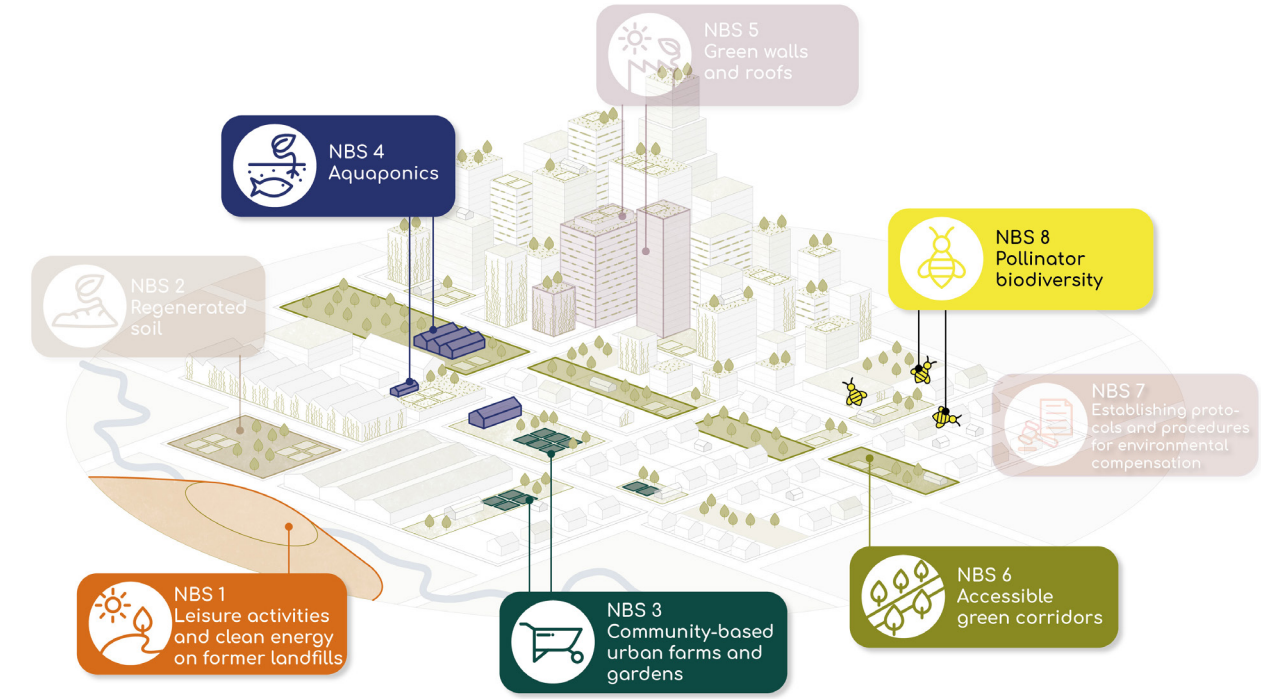


Figure 1: Implemented proGIreg NBS in the Living Lab Dortmund (RWTH)

Co-design activities take place in varying intensities. In Dortmund, co-design and co-implementation intensities with citizens depended on type of NBS, ranging from informing, consulting, involving to collaborating and empowering in line with the public participation spectrum (International Association for Public Participation).

Involving citizens in low-threshold NBS has been comparatively easy, e.g. urban gardening projects (NBS 3) or improving pollinator diversity (NBS 8). These NBS are easy to communicate and realize, need limited specific knowledge, planning or building permissions, and are more reliable regarding timing and financing. Hence, interested citizens can take part in co-creating single NBS interventions.

NBS requiring hired experts for complex technical, legal, and administrative procedures and construction, (e.g. liability) have proved less prone to actice citizen engagement. In these cases, citizens were informed about design plans, providing useful feed-back, i.e. NBS 1.

Project settings require investigation prior to co-design with citizens, e.g. ownership, building permits): may support a strategic approach, build trust and support, avoid unnecessary effort and potential frustration. In case of contaminated sites it is advisable to check reliable implementation options e.g., project design, degree of contamination and relied restrictions like finances or time frame.
Co-design and co-implementation benefit from openness and flexibility during process phases, not always easy but necessary to master unforeseen situations. This requires creativity and energy from all persons involved.

Table 1 shows the five implemented NBS in the Living Lab Dortmund according to the participation planner matrix:

Table 1: Level of citizen engagement intensity by implemented NBS

NBS	NBS title	Co-design	Co-implementation
NBS 1	Movement Park	Consult	Inform
NBS 3	Food Forest St. Urbanus	Empower	Empower
NBS 4	Aquaponics	Inform	Inform
NBS 6	Deusenberg Foot Path	Inform	Inform
NBS 8	Pollinator Biodiversity	Inform	Inform
NBS 8	Naturfelder Dortmund e.V.	Collaborate	Empower

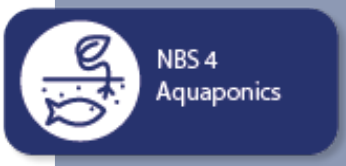
It is noteworthy to highlight significant results and and lessons learnt of co-design, citizen engagement and activities for the implemented NBS:

Movement park

Covid restrictions allowed only selected stakeholders representing future users of Huckarde residents to take part in two co-design meetings. Stakeholders discussed plans and provided valuable improvement suggestions that were incorporated. Overall, stakeholders felt the smaller size of the co-design group did not affect the quality of results. Since its opening, the movement park has been intensely used, demonstratingt the concept meets citizens` desires.

St. Urbanus Food Forest and Permaculture Orchard

The community engagement of creating the food forest has led to strong co-ownership, partly because it belongs to the parish garden. The church community garden and the food forest have gained wide interest among Huckarde residents, it is open to the public while its hidden location lowers the risk of vandalism.
Specific campaigns attract active engagement works: During the annual scout event "72-hour-action" in May 2019, the first five high-raise growing beds were constructed and planted. Covid-19 lockdowns and official social distancing rules led to inventive ideas when the scouts wished to be active during spring 2020: The Urbanisten created a learning youtube video showing how to prepare the ground and organized mini groups of 2 persons working in the garden.

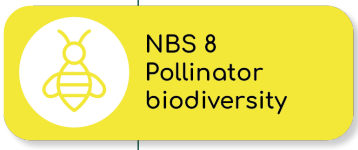


Community managed aquaponics system Hansaponik

With a growing number of stakeholders involved, harmonization processes become more intense. Co-design with many stakeholders to sign the lease contract, design the aquaponics system, work out a licensable building approval plan and finally to construct the system. Each working step engaged a different set of stakeholders. Citizens have been informed about the project via press, internet and during a Verti-Farm trade fair.

Deusenberg Foot Path

Citizens had asked local politics for an additional pedestrian connection to the Deusenberg. Experts supported the planning and implementation due to legal standards, thus limiting citizens co-designing/co-implementing. Soil excavations revealed high contamination levels, requiring intense expert exchanges. These experiences with soil quality will be relevant for the International Garden Exhibition Ruhr 2027, which will also realize projects near the Deusenberg.



Naturfelder Dortmund e.V.

Founding the citizen association coincided with Covid-19 lockdown in 2020. Therefore, first contacts took place online, hampering getting to know and build team spirit more difficult. Nevertheless, the group members from all over Dortmund sowed the first area just couple weeks after their first meeting. In May 2022, the group presented itself at a Dortmund public garden festival. Interested citizens were contacted via press, social media and the internet to found the association Naturfelder Dortmund e.V.

Living Lab results and outlook

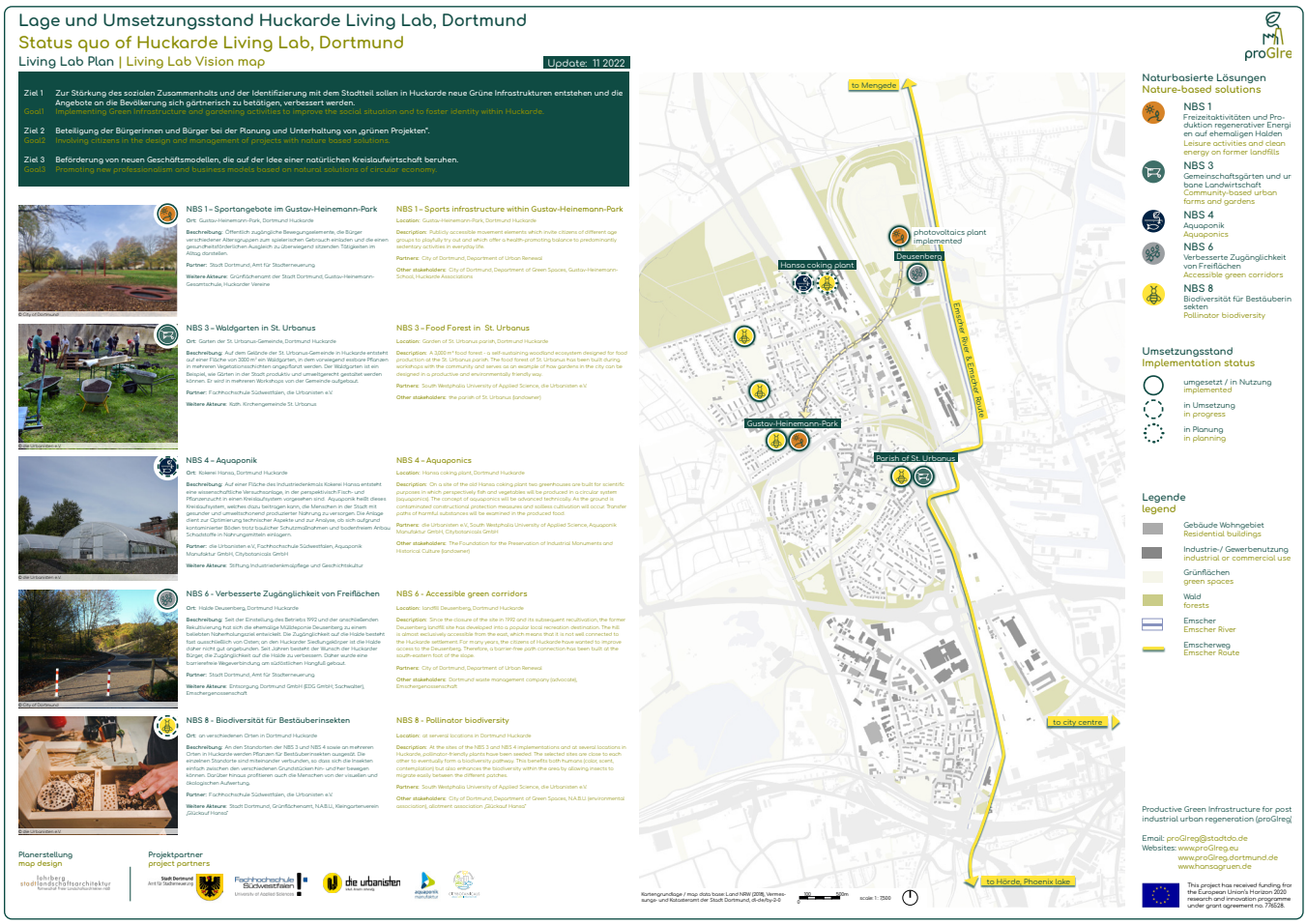


Figure 2: Living Lab map outlining NBS locations, implementation status and description

Achievements and lessons learnt

All five planned NBS could be implemented in the Dortmund Living Lab (fig. 2) despite financial constraints or political support in the preparation phase. Planning and implementing the NBS has been an inter- and transdisciplinary learning process during the five-year project, involving a large number of stakeholders. Open communication, creative support, patience and endurance helped to proceed. ProGIreg activities in the Living Lab helped to create awareness about green issues and raise interest to get engaged. The NBS have considerable effect on active stakeholders. Achievements can be grouped as follows:

Improving the green infrastructure in Huckarde

- Inviting citizens to take part in gardening and biodiversity projects provides valuable information about the importance of green infrastructure. Engaged stakeholders in proGIreg projects gain deeper insights into green urban regeneration and transformation potential.

Social cohesion within NBS project groups

- Being part of a group following the same goal has strengthend social cohesion among the local community in Huckarde, e.g., St. Urbanus parish or actors meeting for the first time at the assocation Naturfelder Dortmund e.V. to create pollinator-friendly flower meadows. This may help to create stronger emotional bonds to the Huckarde district and enhances local identity.

ProGIreg – a project with local vibrancy

- Huckarde citizens are key beneficiaries of proGIreg activities. The implemented NBS improved the quality of living on the implementation sites and explored new green concepts. However, the proGIreg NBS tend to be too small-scale to have notable effects on the local economy or being able to solve structural disbalances in Huckarde.

Maintenance of all implemented NBS is secured in the Living Lab Dortmund

beyond proGIreg allowing for continuity a s sustainability has been a major goal.

Lessons learnt can be grouped as follows:

Project preparation is time consuming

- All NBS started from scratch. Project partners underestimated the time for creating networks and finding suitable areas for NBS.
- Time consuming planning and approval procedures for construction projects (NBS 1,4,6). The construction projects finally started in 2022, delayed by around two years.
- Finding areas and then work out a biodiversity or urban gardening project with citizens in an open process was not successful. Several housing companies refused to provide land.
- Owners hesitate to offer sites for projects without concrete plans.

Projects on contaminated sites require extra time and finances

- additional planning and implementation actions to comply with legal requirements.
- The level of soil quality determines the amount of expertise required.

Incremental approach

- Aquaponics systems typcially grow and distribute plants and fish. Due to the complicated approval process of building two greenhouses during the project time, the NBS will be developed step-by-step: 1) obtaining approval to grow plants tested for harmful substances, 2) applying to distribute plants, 3) applying to rear and sell fish.

Outlook

Project partners continue to work in the fields of aquaponics, urban gardening and urban renewal and can build on networks and knowledge gained during proGIreg. Replication potential has been identified to extend networks regarding aquaponics systems at schools, new green corridors on contaminated sites in the South of the Living Lab (Hoesch Spundwand area), ground preparations to build a bridge between Hansa Coking Plant and the Deusenberg landfill.
Some NBS will gain national and international attention within future contexts and projects:

- **INCiTiS-Food (2023-2026) - international research project**

The aquaponics system will be further developed and operated through INCiTiS-Food. SWUAS and international partners will explore the potential of aquaponics as an alternative for small scale farmers to produce food in third world countries.

- **International Garden Exhibition Ruhr 2027 (IGA 2027): "How do we want to live tomorrow?"**

Hansa Coking Plant and Deusenberg will be key sites of the IGA 2027, thus integrating the aquaponics system. The footpath (NBS 6) will be part of the barrier-free access to Deusenberg. Also planned are several urban regeneration projects in Huckarde, Hansa coking plant and Deusenberg: upgrading green infrastructure in the urban structure, extending the path system around Deusenberg and creating new sports offers.

NBS 6 Green corridor connecting Huckarde with the Deusenberg

NBS 1 Movement park in Gustav-Heineman-Park in Huckarde

proGIreg

NBS 4 Aquaponics greenhouses on the former Hansa Coking Plant (c) M. Olbertz

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Partners

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aquaponik manufaktur

lohrberg stadtlandschaftsarchitektur
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