proGIreg kick-off conference

Dortmund, 25-26 September 2018
Report on Deliverable 6.1, amendment 01

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Contents

Partner organisations

No.	Name	Short name	Country
1	RHEINISCH-WESTFAELISCHE TECHNISCHE HOCHSCHULE AACHEN	RWTH	Germany
2	STADT DORTMUND	DORTMUND	Germany
3	ICLEI EUROPEAN SECRETARIAT GMBH (ICLEI EUROPASEKRETARIAT GMBH)	ICLEI	Germany

Abbreviations

proGIreg: productive Green Infrastructure for post-industrial urban regeneration
NBS: nature-based solutions

Executive Summary

This report provides an overview of the programme and contents of the proGIreg kick-off conference which took place in Dortmund from September 25 to 26, 2018 and was attended by 110 participants from within the proGIreg project consortium and external participants.

1. Kicking off proGIreg

To kick-off the innovative green regeneration project proGIreg, a conference took place in Dortmund on September 25 and 26, 2018. The conference venue “Alte Schmiede” is the former forge of coal mine Hansa which has been transformed into a cultural centre used and managed by the local citizen’s associations. It is located within the Dortmund proGIreg Living Lab area in the borough of Huckarde. The conference aimed to introduce the topic of nature-based solutions for urban regeneration to the wider public and also was an important event for the consortium. Hence it was connected to project-internal meetings such as the General Assembly, work package and Board meetings for getting updated, project planning and discussions, taking place on the 24 and 26 of September.

The conference was structured by plenary presentations and panel discussions on nature-based solutions, their replication, upscaling and business models (see programme in the next chapter). Speakers included the Lord Mayor of Dortmund Ullrich Sierau, the EASME project officer Ugo Guarnacci, proGIreg Ethics Board member Stefan Böschen (RWTH Aachen), work package leaders from proGIreg and stakeholders from the Dortmund Living Lab.

The proGIreg front runner cities of Dortmund (Germany), Turin (Italy), Zagreb (Croatia) and the follower cities Zenica (Bosnia and Herzegovina), Cascais (Portugal), Piraeus (Greece) and Cluj-Napoca (Romania) presented the post-industrial areas of their cities and related challenges in a dynamic market place format. The front runner cities presented plans for their Living Labs, which are being regenerated through nature-based solutions (NBS).

The programme included a field visit to the local industrial heritage site within the Living Lab, the Hansa coking plant on the 25th. On the 26th an extended field visit was organised to the urban renewal area in the district Dortmund-Hörde. It included the PHOENIX See project, which was awarded with the German national Prize for Urbanism 2018 (“Deutscher Städtebaupreis”, granted by the Deutsche Akademie für Städtebau und Landesplanung). The site of a former steel factory has been transformed into an area for housing and economic activities around a new lake as its central public space. The tour presented the lake and its water management as a NBS as well as smaller projects of co-creation with local citizens and the PHOENIX West business park which is under development on another former steelworks site. Guided by local experts, these visits gave participants inspiration for their own upcoming urban regeneration plans and NBS implementation.

110 participants attended the conference, 75 of them representing the 32 consortium partners and the future Chinese partner organisation IUE-CAS. The other participants included representatives from other Horizon 2020 NBS-projects, local stakeholders from the Ruhr region as well as persons from other European countries interested in topics discussed during the conference.

2. Public programme

	Tuesday 25/09/2018: Conference on Nature-Based Solutions
	Venue: Alte Schmiede, Hülshof 32, 44369 Dortmund-Huckarde
9:00	Registration and coffee
	Welcome and Introduction
9:30	Urban green infrastructure: success stories and future ambitions *Ullrich Sierau, Lord Mayor of the City of Dortmund*
10:00	Nature-based solutions in the EU strategies for inclusive urban regeneration *Ugo Guarnacci, European Commission, Executive Agency for Small and Medium sized Enterprises (EASME)*
10:20	Making nature-based solutions work: Horizon 2020 innovation action proGIreg *Axel Timpe, RWTH Aachen University, proGIreg coordination*
	Living Labs: Cities in Research and Innovation
10:45	Living Labs: promises and challenges of a new research infrastructure *Stefan Böschen, proGIreg Ethics Board / RWTH Aachen University HumTec*
11:00	Sustainable innovations: the role of local governments *Barbara Anton, ICLEI European Secretariat*
11:15	Making our city a laboratory for innovation: Discussion panel of city representatives *Alessandra Aires, City of Turin* *Andreea Muresan, City of Cluj-Napoca* *Thomas Jacob, City of Hamburg/CLEVER cities* *Barbara Anton, ICLEI European Secretariat/proGIreg*
12:00	(light) Lunch

13:00 **After-lunch Walk in the Dortmund Living Lab / Visit of Hansa Coking Plant**

Visiting the former coking plant conserved and reused as an industrial heritage site, explanation of the implemented nature-based solution for stormwater management

Living Lab Dortmund-Huckarde

14:45 From old industries to new gardens: Emscher Green Corridor and International Garden Exhibition Metropole Ruhr
Stefan Thabe, City of Dortmund – Urban Planning

15:10 Productive city: ideas for community-based aquaponics and urban gardening
Jan Bunse, die Urbanisten e.V.

Challenges and Solutions: proGIreg Cities' Market Place

15:30 Front runner and follower cities present their challenges, Living Labs and planned nature-based solutions at market stands with posters, models and information material

16:40 Coffee break

Nature-Based Solutions Reference Base and Replication

17:00 Making performance measurable: nature-based solutions benefit assessment
Carlo Calfapietra, Consiglio Nazionale Delle Ricerche Italy

17:20 Making nature-based solutions a business: replication strategies through business models
Bernd Pölling, South Westphalia University of Applied Sciences

17:40 **Concluding Remarks and Prospects for the proGIreg Project**

Frank Lohrberg, RWTH Aachen University

18:00 End of conference

Wednesday 26/09/2018: Public Field Trip

Venue: Hermannstraße at subway station Dortmund-Hörde Bahnhof (Line U41) at old clock 'Schlanke Mathilde'

13:00 **Field Trip: Urban Regeneration and Green Infrastructure in Dortmund**

- Blue-green infrastructure PHOENIX See: new lake on a former steelworks site
- Renaturing the Emscher River as part of the Emscher Landschaftspark
- PHOENIX-West: combining industrial heritage and new economic activities
- Urban gardening Dortmund Hörde

Presented by City of Dortmund and die Urbanisten e.V.

17:00 Back at Dortmund Central Station

3. Photo documentation

An extended photo documentation of the conference can be found here:
https://www.flickr.com/photos/iclei_europe/sets/72157674046073918/

Figure 1 The venue "Alte Schmiede" offered an inviting setting for the conference

Lucy Russell

Figure 2 Participants listening to the presentations

Teresa Kops

Figure 3 Discussion with the CLEVER cities project leader

Teresa Kops

Figure 4 Discussions during the cities' market place

Teresa Kops

Figure 5 Discussions during the cities' market place

Lucy Russell

Figure 6 Discussions during the cities' market place

Teresa Kops

Figure 7 Field visit Hansa coking plant

Teresa Kops

Figure 8 Field visit Hansa coking plant

Rieke Hansen

Figure 9 Field visit Hansa coking plant

Teresa Kops

Figure 10 Field visit Hansa coking plant

Rieke Hansen

Figure 11 Field visit Dortmund Hörde: the newly developed PHOENIX See

Teresa Kops

Figure 12 Field visit Dortmund Hörde

Teresa Kops

Figure 13 Field visit Dortmund Hörde

Teresa Kops

Figure 14 Field visit Dortmund Hörde: the renatured Emscher river

Rieke Hansen

Annexes

Annex A: Registered participants

No.	Organisation (for reasons of data protection names of participants have been removed; bold letters represent persons that are part of the proGIreg consortium)
1	**Amt für Wohnen und Stadterneuerung**
2	**Aquaponik Manufaktur GmbH**
3	**aquaponik manufatur GmbH**
4	Bezirksamt Harburg / Dezernat Wirtschaft, Bauen und Umwelt
5	**Cascais**
6	**Cascais**
7	**Cascais Ambiente**
8	CIBIO / FCUP
9	**City of Dortmund**
10	City of Dortmund
11	City of Dortmund
12	City of Hamburg, Senate Chancellery
13	**City of Piraeus**
14	**City of torino**
15	**City of Torino**

16	**City of Torino**
17	**City of Zagreb Bureau for Physical Planning (ZZPUGZ)**
18	**City of Zagreb, Bureau for physical planning, ZZPUGZ**
19	**CITY OF ZAGREB, Office of Strategic Planning and Development of the City**
20	**City of Zenica**
21	**City of Zenica**
22	**Cluj Metropolitan Association**
23	**Cluj Metropolitan Association**
24	**Cluj Municipality, chief architect**
25	**CNR**
26	**CNR**
27	**CNR**
28	**Comune di Torino**
29	Consultancy Research &Innovation/ Architecture /Planning _Mari Carmen Garcia Mateo
30	**COTO**
31	DGGL LV Ruhrgebiet
32	**die Urbanisten**
33	**die Urbanisten e.V.**
34	**Die Urbanisten e.V.**

35	DOGEWO21
36	Dortmunder Bio-Hof Schulte-Uebbing
37	**DUAL SRL**
38	**Environment Park Spa**
39	**EU**
40	**European Federation of Green Roof and Living Wall Associations - EFB**
41	**Fachhochschule Südwestfalen**
42	**Faculty of Architecture University of Zagreb**
43	**Faculty of architecture University of Zagreb**
44	**Fh Soest**
45	**FH Südwestfalen**
46	FH Südwestfalen
47	**FH-Südwestfalen (SWUAS)**
48	**Fondazione della Comunità di Mirafiori ONLUS**
49	GrüneG eG
50	Hamburgisches WeltWirtschaftsInstitut
51	Häme University of Applied Sciences, HAMK
52	**heitro gmbh**
53	**IBAF-CNR**

54	**ICLEI**
55	**ICLEI - Local Governments for Sustainability**
56	**ICLEI European Secretariat**
57	**ICLEI European Secretariat**
58	**ICLEI Local Governments for Sustainability**
59	**Institute of Urban Environment, Chinese Academy of Sciences**
60	**Institute of Urban Environment, Chinese Academy of Sciences**
61	**ISGlobal**
62	**ISGlobal**
63	ITEMS International
64	James Hutton Institute
65	**KEAN**
66	**KEAN Kyttaro Enallaktikon Anazitiseon Neon**
67	**KEAN-Cell of Alternative Youth Activities**
68	Landwirtschaftskammer NRW
69	**Lehrstuhl für Landschaftsarchitektur, RWTH Aachen University**
70	LGV
71	**lohrberg stadtlandschaftsarchitektur**
72	**lohrberg stadtlandschaftsarchitektur**

73	**Lohrberg stadtlandschaftsarchitektur**
74	N.N.
75	N.N.
76	**ORTIALTI**
77	**OrtiAlti**
78	Planergruppe Oberhausen
79	**Politecnico di Torino**
80	**Politecnico di Torino**
81	Project Managment Jülich
82	Projektträger Jülich
83	Rat der Stadt Dortmund
84	Regionalverband Ruhr
85	Regionalverband Ruhr
86	Regionalverband Ruhr (RVR)
87	REICHER HAASE ASSOZIIERTE GmbH
88	RWTH Aachen
89	**RWTH Aachen University**
90	**RWTH Aachen University**
91	**RWTH Aachen University**

92	**RWTH Aachen University, Institute of Landscape Architecture**
93	**RWTH Aachen University, Institute of Landscape Architecture**
94	Soziales Zentrum Dortmund e.V.
95	Stadt Dortmund
96	**Stadtplanungs- und Bauordnungsamt**
97	**Starlab Barcelona SL**
98	**SWUAS**
99	TRANSMITTER Potenzialentwicklung
100	Uni Duisburg
101	**UNIBA**
102	**University of Bari**
103	**University of Turin**
104	**UNIVERSITY OF TURIN**
105	**URBASOFIA**
106	Werkhof Projekt Die Gärtnerei
107	Westfälisch-Lippischer Landwirtschaftsverband
108	Wirtschaftsförderung Dortmund
109	**Zenica Development Agency ZEDA**
110	**ZIPS**

Annex B: Social Media Coverage of the conference

ProGIreg
@proGIreg
Folgen

12 years ago, this space was completely built up with no water to be seen: by 2011, the Phoenix Lake was opened and is one of the best-known recent redevelopment projects in Germany. The #proGIreg team visits the site in #Dortmund!

05:10 - 26. Sep. 2018

3 Retweets **4** „Gefällt mir"-Angaben

Horizon 2020 Marguerite GAZZE, Stadt Dortmund und 6 weitere

3 4

ProGIreg
@proGIreg
Folgen

Field visit to the Hansa coking plant in #Dortmund. Over the next 5 years, the city will implement new nature-based solutions with and for citizens in post-industrial areas of the city through the #H2020 #proGIreg project!

07:59 - 25. Sep. 2018

7 Retweets **13** „Gefällt mir"-Angaben

Marguerite GAZZE, Horizon 2020 Stadt Dortmund und 7 weitere

7 13

ProGIreg
@proGIreg
Folgen

Ugo Guarnacci of the European Commission emphasises the importance and potential of adaptive reuse of areas of industrial heritage for inclusive regeneration - where better to do this than in #Dortmund, #Zagreb and #Turin as part of #H2020 #proGIreg?

03:06 - 25. Sep. 2018

9 Retweets **18** „Gefällt mir"-Angaben

Marguerite GAZZE, Horizon 2020 Stadt Dortmund und 7 weitere

1 9 18

heitro
@citybotanicals
Folgen

Happy about starting the EU funded Horizon2020 project proGIreg today with Kick-off Event in dortmund! #progireg #dortmund #sustainability #nbs #naturebasedsolutions

02:34 - 25. Sep. 2018 aus Dortmund, Deutschland

1 Retweet **5** „Gefällt mir"-Angaben

1 5

ProGIreg
@proGIreg
Folgen

Project coordinator Axel Timpe of @RWTH invites stakeholders from #Dortmund to participate in #proGIreg to get involved in the project, whether by becoming involved in Living Lab co-design, implementing #naturebasedsolutions or by creating business plans based on proGIreg models

02:36 - 25. Sep. 2018

3 Retweets 8 „Gefällt mir"-Angaben

Pietro Elisei
@pietroelisei
Folgen

The Horizon 2020 proGIreg Kick-off conference just started in the Dortmund morning sun. This is going to be a very interesting day and a great opportunity to discuss and think about Nature Based Solutions and the upcoming work in the project. @urbasofia , @proGIreg

01:23 - 25. Sep. 2018

2 Retweets 7 „Gefällt mir"-Angaben

ProGIreg
@proGIreg
Folgen

"If an administration would like to be successful, they need to work with civil society: the people who live in a quarter are the experts of that quarter": Lord Mayor of #Dortmund Ullrich Sierau welcomes #proGIreg project to his city, kicking off five years of #NatureforRenewal!

01:20 - 25. Sep. 2018

9 Retweets 14 „Gefällt mir"-Angaben

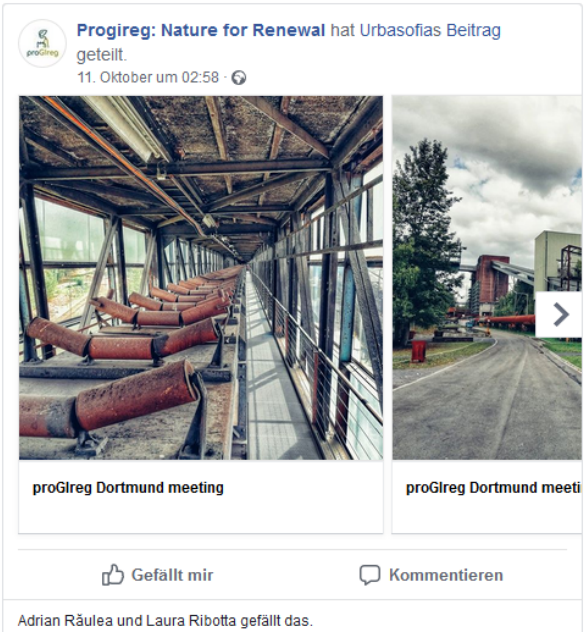
Stadt Dortmund, ProGIreg, Grad Zagreb feed und 7 weitere

Progireg: Nature for Renewal hat 4 neue Fotos hinzugefügt.
11. Oktober um 03:31 ·

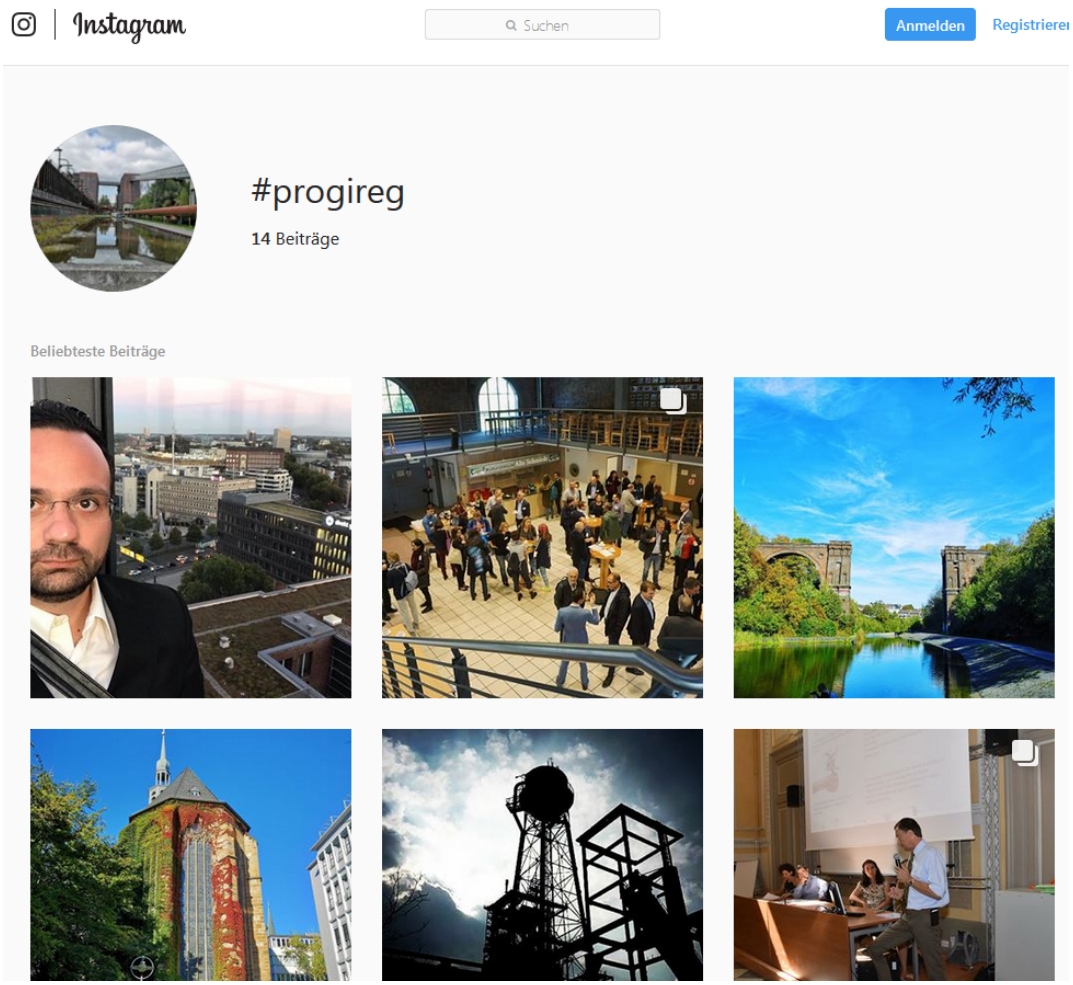
Planning #naturebasedsolutions with and for communities: Team #proGIreg in action at the kick-off conference in Dortmund

Gefällt mir Kommentieren

Ben Janus, Urbane Produktion und 2 anderen gefällt das.


Progireg: Nature for Renewal hat Urbasofias Beitrag geteilt.
11. Oktober um 02:58 ·
proGIreg Dortmund meeting
proGIreg Dortmund meeti
Gefällt mir
Kommentieren
Adrian Răulea und Laura Ribotta gefällt das.


Progireg: Nature for Renewal
21. September ·
Dortmund will host the #proGIreg kick-off conference on post-industrial regeneration next week 25-26 Sept
Gefällt mir
Kommentieren
Urbane Produktion gefällt das.


Instagram
Suchen
Anmelden
Registrieren
#progireg
14 Beiträge
Beliebteste Beiträge

Annex C: Posters City Market Place and public presentations

All proGIreg front-runner and follower cities presented their urban regeneration challenges, their existing green infrastructure and their plans on NBS in the cities market place. The posters used for this are displayed in this annex.

All proGIreg Work Package leads, the head of the External Ethics Board and the local stakeholders from the Living Lab in Dortmund presented their plans for the project in public presentations. The presentation slides are presented in this annex, but are incomplete without the oral presentation held at the conference.
The sole responsibility for the content presented and copyrights lies with the authors of the presentations!

Stadt Dortmund

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proGIreg

Dortmund

and its Green Infrastructure

Front Runner City

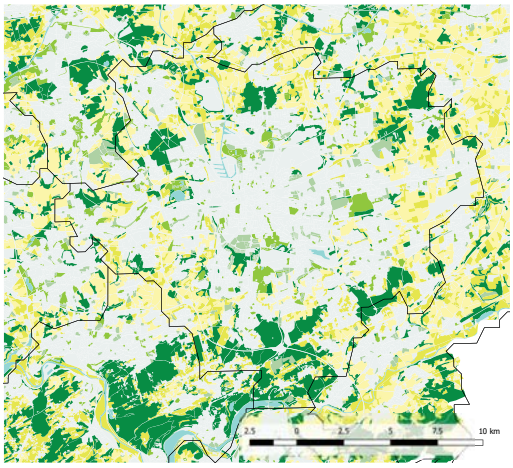
Industrial Heritage

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 8th largest city with more than 600.000 inhabitants, moderately growing and attracting again young families to move in.

Green Infrastructure



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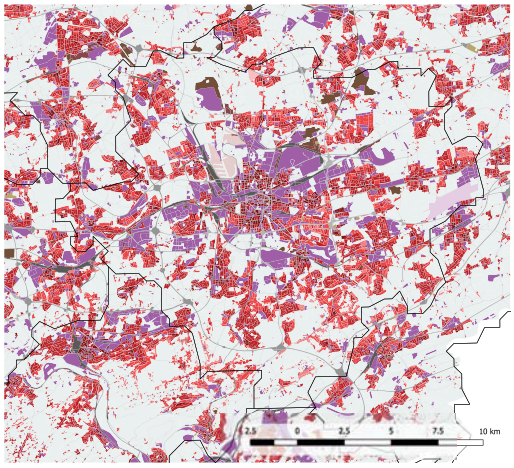
Regeneration Challenges



© urban atlas, edited

© Stadt Dortmund, Stefanie Kleemann

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.

© Stadt Dortmund, Dagmar Knappe

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.

© Stadt Dortmund, Dagmar Knappe

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.

© Stadt Dortmund, Roland Gorecki

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

proGIreg

Stadt Dortmund

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 776528.

proGIreg

Dortmund
as a Living Lab

Front Runner City

Living Lab area

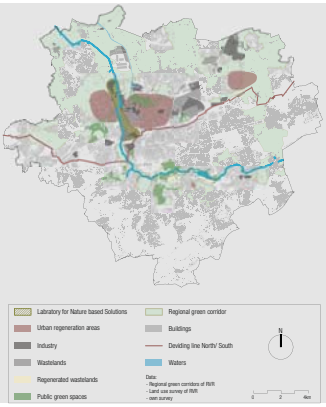
Dortmund´s Living Lab extends along the Emscher river for about 5 km mostly as a narrow belt. Here, the river is flowing about 2 km west of Dortmund city center in south-north direction between Dortmund-Dorstfeld and Kokerei Hansa.

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).

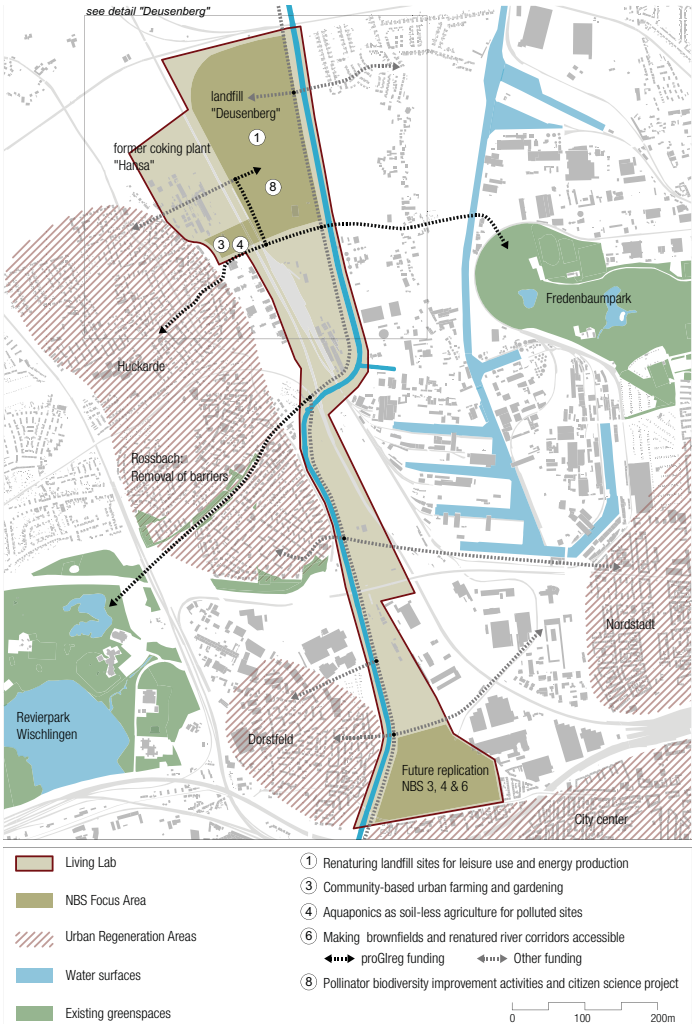
For almost 100 years the canalized 83 km long Emscher has been the Ruhr area´s wastewater sewage. Due to land subsidence caused by coal mining it was not possible for long to build an underground canal system. East of the Emscher a 45 ha large area had been filled with waste. In 1926/ 1927 east of Dortmund-Huckarde 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 attractivity 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 m² 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

© Stadt Dortmund, Dagmar Knappe

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

© Stadt Dortmund, Dagmar Knappe

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

© Attila Toth

Emscher river, renatured

Thanks for contribution to: Dagmar Knappe

proGIreg

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Dortmund
and its Focus NBS

Front Runner City

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

Installation of a community managed 200 m² aquaponics system

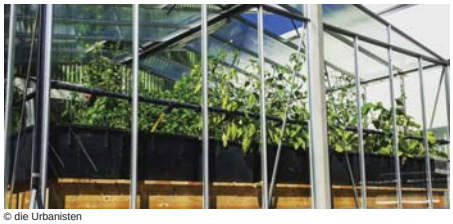
The plan is to design, build and run a 200 m² lower tech, low cost aquaponics greenhouse. Aquaponics combines water-based aquaculture and hydroculture into a resource-friendly circulating system. The soilless cultivation system allows usage of areas with poor soil condition or even with contaminated 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 Pöllig

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

© Attila Toth

Core Stakeholders

Since 2010, die Urbanisten have been combining professional planning strategies with new approaches regarding participation of residents in neighborhood development. In proGIreg 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 proGIreg FH Südwestfalen is leading WP 5 “Market readiness, barriers and upscaling” and contributing to planning, implementation, and assessment of NBS in the FRC Dortmund.

Thanks for contribution to: Nils Rehkop, Jan Bunse, Axel Störzner, Bernd Pölling, Dagmar Knappe

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 776528.

Turin
and its Green Infrastructure

Front Runner City

a Smart City of Innovation and Culture

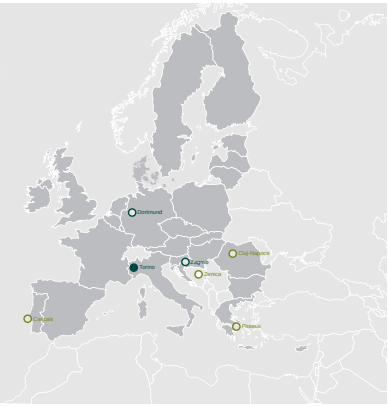
The Municipality of Turin is the capital of the Piedmont region (North-West Italy). With 908.000 inhabitants, 130 km² territorial extension and a GDP of 55.000 million euro (which is 4.5 of the national GDP) it is one of the most important cities in Italy. The administration, with about 9.000 civil servants, deals with the overall management of municipal assets and public services. Since the 1990 s, Torino has been transformed from an industrial capital (predominantly in the automotive sector) into a centre of innovation and culture.

In 2009, Turin officially kick-started its path to become a "Smart City", when the City Council decided to take part in the "Covenant of Mayors" initiative of the European Commission. As one of the first Italian cities, it developed an Action Plan for Energy in order to reduce its CO_2 emissions more than 20 by 2020. In 2016, the City won the second prize as "European Capital of Innovation" for open innovation models supporting social innovation start-ups and creating new market opportunities for urban innovations.

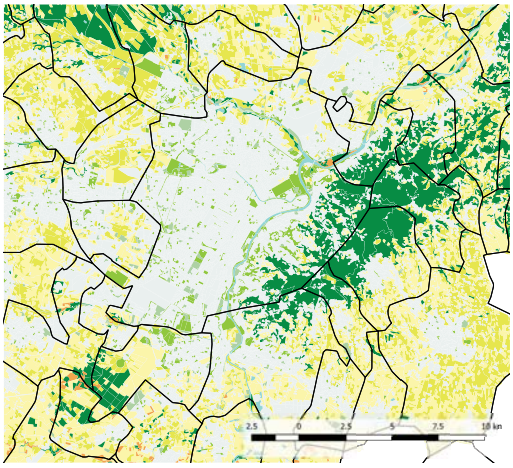
Torino's Green Infrastructure Network

In parallel, the City developed its green vocation trough integrated actions for urban regeneration and sustainable mobility. Since the 1970s, the urban green area grew from 4 to 18.4 million m², reaching a standard per inhabitant of 19.05 m² that puts Turin in first place in Italy. This remarkable increase, a result of a far-sighted and ecologically sound strategy, was guided by a series of urban studies elaborated since the late 1970s which informed the General Regulatory Plan approved in 1994. Now, the city s urban green network includes:

- the "Green-Blue System" connecting four river corridors and the Green Circular, a 45km path system connecting hills and river banks
- the "System of the Cyclopists" along transport corridors and within the system of urban and peri-urban parks
- the "Spine System", green areas created following former railway lines and industrial areas of the semicentral urban area
- the "Urban Park Network", parks and gardens of the core urban area
- the "Urban Tree Network", the city's woodland heritage network distributed across the city
- the "Network of small green neighbourhood areas" for which the city administration is seeking direct involvement of citizens groups.



Green Infrastructure



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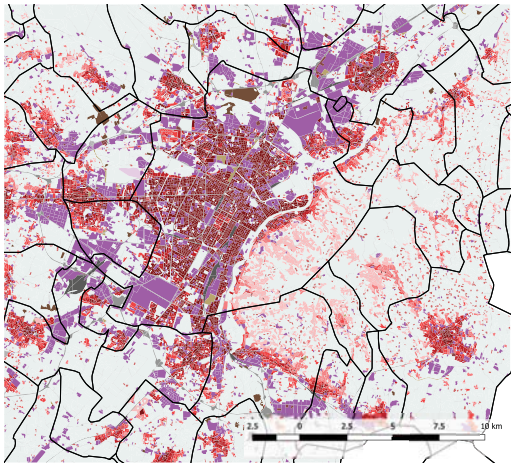
Regeneration Challenges



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© Citt di Torino

An urban renewal programme, launched in 1998, gave derelict post-industrial areas a new use. Reminiscent of a necklace, the interventions line up along a development axis called the "spina" (backbone). With 45 hectares "Spina 3" is the largest project within the comprehensive structural redevelopment. Due to the positive inclusion of its industrial heritage, the Parco Dora signifies a new understanding of inner urban landscapes that reflects the transition of society.

© Citt di Torino

Urban agriculture: For years Turin has been using sheep and cows for mowing large areas. This mode gives a valid support for mowing the grass and for fertilizing the soil, as well as allows savings both in terms of economy and in terms of CO_2 reductions. The "large plot of vineyard populated by fruiting plants", which extends on the hill north of ueen s Villa, was created as agricultural part of the Vineyard and designed in the early 17th century. In 2009, the first official ueen s vineyard harvest took place: 40 tons of ripe and healthy grapes gave birth to the first bottles of "Vigna della Regina".

© Laura Ribotta and Matteo Baldo

Cascina Piemonte is an old farmhouse in the Sangone Park, owned by the city, historically used for agricultural purposes but now abandoned. It will be used by "Associazione Coefficiente Clorofilla" for social farming activities (teaching, training and job placement).

© Laura Ribotta

Abandoned and vandalized building in the former industrial areas.

© Citt di Torino

Torino Citt d'Acque (Turin water city), officially approved in 1993, provides for the recovery of banks of rivers into a single river park of 70 km, with an area of 17 million m². The project links the four rivers of Turin (Po, Dora Riparia, Stura, Sangone) into a continuous system of river parks connected by networks of pedestrian, cycling, naturalistic and educational routes, including protection and enhancement of the environmental and architectural peculiarities for each watercourse.

© Laura Ribotta

Former Fiat (FCA) plant today used for events. Temporary use for proGIreg: events and Living Lab for testing hydroponic solutions in former industrial sites.

Thanks for contribution to: Laura Ribotta, Riccardo Saraco, Elena Deambrogio

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 776528.

Turin
as a Living Lab

Front Runner City

Living Lab area

The Turin Living Lab (LL) will test and develop models for participatory urban regeneration whilst implementing the new municipal regulation on common goods. The LL area is the post-industrial "Mirafiori Sud" district (40 000 inhabitants on 12 km²) which is located along the river Sangone.

The former working class district is characterised by poor quality of the urban environment (green and grey infrastructure) accompanied by social segregation, poverty and security problems. It hosts different social groups (Roma, Sinti, Camminanti siciliani).

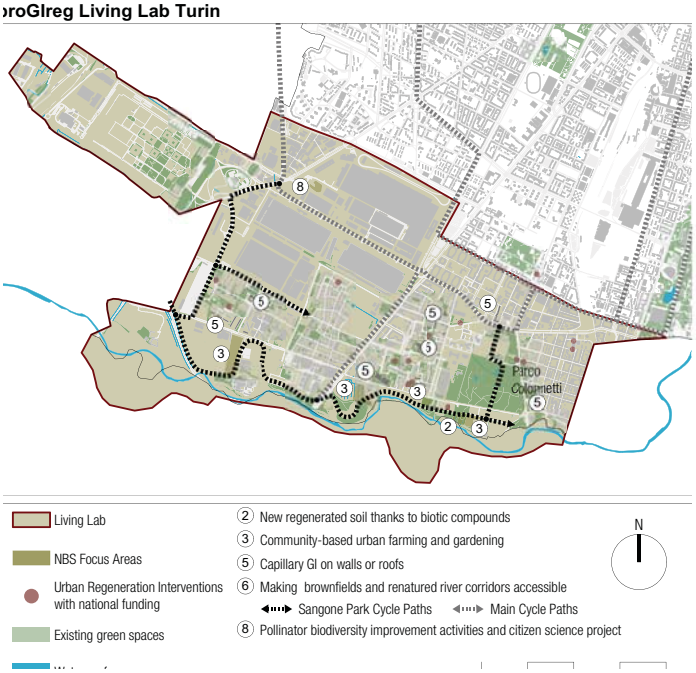
The area, however, offers several key opportunities which can be further developed: active local associations, recent green infrastructure operations, industrial and pre-industrial cultural heritage, abandoned or underused private or public buildings available for new community vocations.

The main goal in Turin is to implement an urban regeneration plan with measures, activities and tools that will

- regenerate, valorise and make accessible abandoned or underused areas: Sangone river, parks, and the remains of the historic Mirafiori Castle
- improve the security of these places: involve citizens in the management and maintenance of common goods (public green spaces, cycle paths, etc.)
- foster and support urban greening activities, especially urban agriculture, as social and inclusive actions which will enrich the skills of inhabitants and create new social entrepreneurship and economic opportunities.

Living Lab Plans

proGIreg Living Lab Turin



As part of the larger urban regeneration programme within the Turin LL the following nature-based solutions will be implemented:

NBS 2:
a 2 000 m² test area "New soil and plant species for urban forestry" in Parco Sangone

NBS 3:
a 8 ha development area for urban farming and gardening involving disadvantaged groups

NBS 4:
a small aquaponics testing installation, implemented in cooperation with experts from Dortmund LL involving local communities for future replication

NBS 5:
small scale green infrastructure interventions (green walls, green roofs, urban gardens) in deprived neighbourhoods, with active inclusion of specific target groups (including education in schools and collective gardening projects involving refugees)

NBS 6:
a new greenway and cycling corridor along Sangone river which is connected to the overall Turin metropolitan cycling network and links ex-industrial private areas with public ones

NBS 7:
New environmental compensation instruments, connected with the environmental assessment and compensation of big events and the realization of a "green business network"

NBS 8:
Pollinator friendly green spaces, to encourage bee-keeping and honey production as well as bee monitoring, involving local communities in citizen science project.

Current Situation

© Laura Ribotta

After the Second World War this area was dedicated to the National Agricultural Mechanic Centre. Later the buildings were used for social housing and today they are abandoned. With the co-design process, citizens will decide which NBS can be implemented here.

© Laura Ribotta

The green roof of the "casa del Parco" (civic centre), which has undergone vandalism over the years, will be restored and returned to public use.

© Laura Ribotta

The new soil test area.

Thanks for contribution to: Laura Ribotta, Riccardo Saraco, Elena Deambrogio

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Turin
and its Focus NBS

Front Runner City

NBS no.5
capillary Green Infrastructure on walls and roofs

Small Scale GI Interventions

Green walls and roofs for productive use will be created in the Turin LL area. Initial implementation will be located on public and social housing buildings, schools and the Casa nel Parco and then additional locations will be identified with the help of citizens.

expected benefits:

The “Castello di Mirafiori” school, a mixed school/ association building, will be used as the LL information centre, hosting the testing of innovative solutions. This will allow the development of a new model of a school-civic centre on a site which is scarcely used and has low student uptake problems presently.

Torino‘s Support for NBS in general

In 2016 the City Council has approved a master plan amendment to support the development of farms geared towards multi-functionality (farming, eco-tourism, agriculture, education and horticulture). Another useful action for the development of Nature Based Solutions was an amendment to the municipal building regulations, promoting the creation of garden and allotments on flat roofs. Finally, the new “Urban Common Regulations” allow citizens to establish collaboration agreements with the administration for the care of urban assets, including green spaces and deprived/abandoned areas.

© Ortoale Le Fonderie Ozanam, Torino

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NBS no.2
new regenerated soil thanks to biotic compounds for urban forestry and urban farming

New Soil

For the construction of new green areas soil of good agronomical and environmental quality is necessary. However, the municipalities in the Torino urban area report that available arable soil is almost used up. Innovative solutions, which aim at the preservation of natural soil and comply with the principles of circular economy, are needed. NBS 2 will be applied for the afforestation of Sangone Park through the experimental use of new soil“.

Excavated soil substrates, compost from municipal solid waste and specific microbial consortia are components of a soil substitute to be developed.

expected benefits:

Instead of producing waste, this NBS uses a circular stream of resources. The soil substitute developed will be an eco-product to be included in the list of materials for public green procurement. The NBS implementation will be accompanied by activities which reinforce the link between citizens and public green spaces, e.g. the creation of educational nature trails supported by volunteer guides.

© Laura Ribotta

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NBS no.8
pollinator biodiversity improvement activities and citizen science project

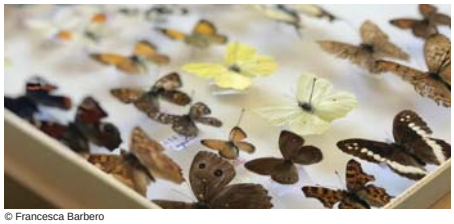
Pollinator Friendly Green Spaces

This NBS creates a systemic link between several other NBS to be implemented in the Turin LL. It complements all greening actions with the aim of promoting pollinator-friendly spaces and in assessing its efficiency in improving the environmental quality, ecological connections and aesthetical values. The NBS will include active citizens participation in the realisation, management and monitoring for social inclusion of mental disorders.

expected benefits:

NBS success will be evaluated through monitoring pollinators that visit the new green areas through a citizen-science approach. Nature-based impact evaluation through biodiversity and environmental quality monitoring (pesticides, honey bees, butterflies), visual analysis on nectar butterflies (plant source of nectar and/or breeding sites). Turin proposes a completely new citizen science project which does not start from scientists but from citizens and focuses on particular group of citizens: doctors and users of mental health centres of Turin.

© Francesca Barbero



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Core Stakeholders

Environment Park SpA (ENVIPARK) is a Scientific and Technological Park located in Turin (Italy), founded in 1996.
ENVIPARK plays a key role in the implementation of the LL in Turin, will assess technical barriers to upscaling of NBS and will help to develop a NBS business model catalogue.

Mirafiori Community Foundation (MIRAFIORI) carries out activities for social cohesion and public benefit promoting the development and improvement of quality of life in the Mirafiori South neighbourhood.
MIRAFIORI plays a key role in implementing the NBS in the Living Lab.

Dual s.r.l. (DUAL) transformed from a small family business to an important company in the building infrastructure and the quarry sector.
DUAL will play a key role in implementation of the Living Lab, in particular in the reuse of soil. It will undertake the testing, classification and splitting of excavated soil and stones.

OrtiAlti (ORTIALTI), established in 2015, is a non-profit organisation working in the field of social innovation, cultural promotion, dissemination, research and experimentation of urban farming practices and reuse of unused urban areas, through the involvement of citizens.
ORTIALTI will be an operative partner for “NBS Pilot implementation”.

The University of Torino (UNITO) is one of the largest Italian Universities and ranked as a top national university. In proGIreg, the following will be involved: IcxT - ICT and Innovation for the Society and the Territory; the Department of Chemistry; the Department of Agricultural, Forest and Food Sciences (DISAFA); the Department of Life Sciences and Systems Biology (DBIOS); and Urban and Event Studies (OMERO).

The Politecnico di Torino (POLITO) has a long-standing tradition of leadership of polytechnic culture. It is one of the most important universities in Europe for engineering and architecture studies and is strongly committed to collaboration with industry.
POLITO will contribute to the spatial analysis of Turin and the co-design processes in the Living Lab. Furthermore, POLITO will help to implement the NBS and the flourishing of the Living Lab.

Thanks for contribution to: Laura Ribotta, Riccardo Saraco, Elena Deambrogio

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agreb
and its Green Infrastructure

Front Runner City

Zagreb and its metropolitan region

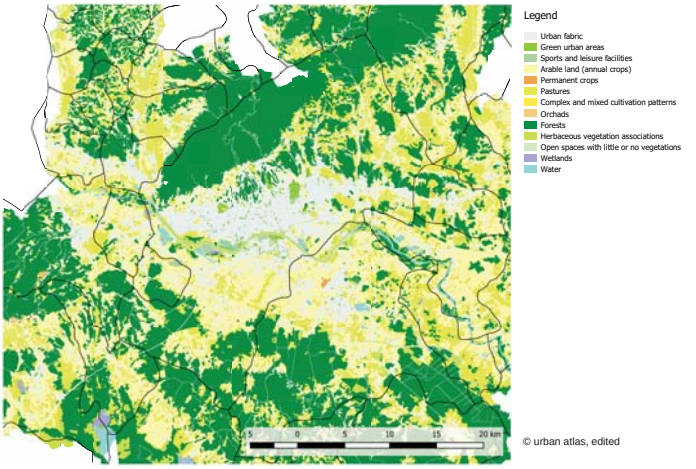
agreb is the capital of Croatia, covering an area of 641 km^2. It has 17 districts and 790 017 inhabitants.

agreb plays a very important role in the wider metropolitan region. Its two neighbouring counties provide a portion of its natural resources and food, as well as residential space for commuters. The surrounding area fulfils agreb citizens' needs for recreation, nature and housing, thus creating further demand for commuting, suburbanisation and the growth of towns in the area.

The population of agreb together with the agreb metropolitan region, consisting of the larger area of 690 municipalities, includes a total of around 1.1m inhabitants. In recent years the suburban population has grown, whilst in contrast, the City of agreb, especially its historical centre, has witnessed a decline in population. agreb continues to integrate and incorporate former suburbs within its urban fabric.

Positioned between the historical centre and the newly planned New agreb, the Sava River and its surrounding area form the geographical axis of the city, as one of its main elements of green infrastructure, the other being the Medvednica mountain, hovering above the city and providing fresh air and ample space for the citizens. Another important element of green infrastructure are urban forests and parks, patches of natural land throughout the town. One of the most important parks, incorporating the zoo and in close contact with the soccer stadium is the Maksimir park .

Green Infrastructure



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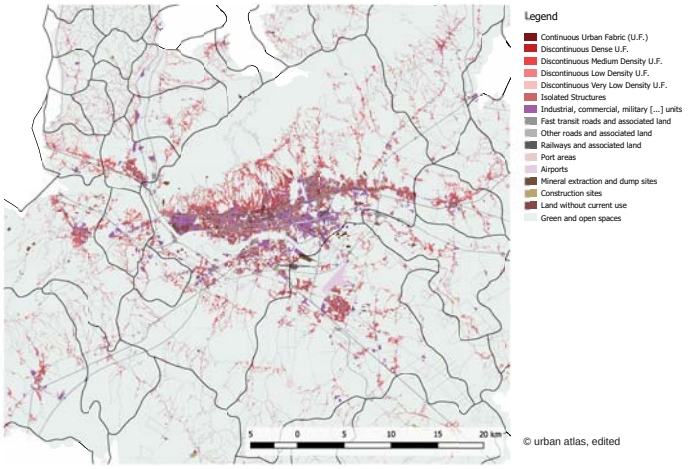
Regeneration Challenges



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Green infrastructure - the slopes of Medvednica mountain north of agreb

© HRG Studio

Green Infrastructure - Maksimir park, northeastern part of agreb

© HRG Studio

Urban regeneration - „Janko Gredelj" rolling stock producing factory

© HRG Studio

Urban regeneration - „Zagrepčanka", former slaughterhouse

© HRG Studio

Sava River and the Jarun lake

© HRG Studio

Podsused, former cement factory

Thanks for contribution to: Iva Bedenko, Matija Vuger, Nives Skreblin, Jelena Bule, Nives Mornar, Bojan Baletic, Mladen Josic

This project has received funding from the European Union s Horizon 2020 research and innovation programme under grant agreement no. 776528.

agreb
as a Living Lab

Front Runner City

Living Lab area

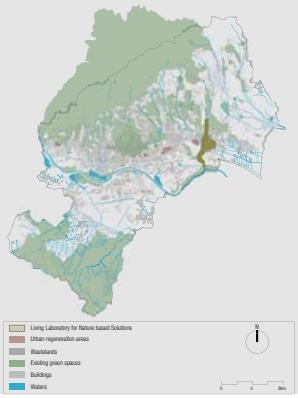
Sesvete is a district of the City of agreb and a part of the agreb urban agglomeration. It is the easternmost neighbourhood of the agreb administrative area, covering 20 of the overall surface area of agreb.

According to the 2011 census, Sesvete has 70 009 inhabitants; the number of households is 22 512 and the number of dwellings 30 256. The population has grown by 10 000 people since 2001 whilst the number of households has grown by 5 000 and the number of dwellings by 10 000. Sesvete has the youngest population in Croatia, with an average age of 38.

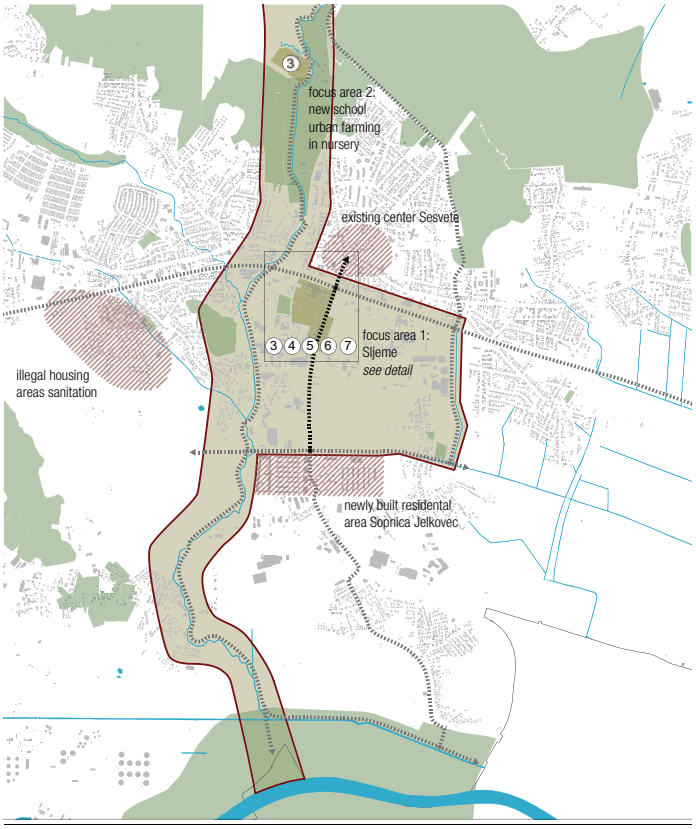
The district is connected to the city centre by railway and several important city roads (Zagrebačka, Branimirova, Slavonska and Vukovarska in the future). The nearby tram station of Dubec may be extended to provide access to the centre of Sesvete. The Sesvete District is also located on important European traffic corridors leading to Budapest, Riga, Germany, Austria, Belgrade, Sofia, Athens and Istanbul.

It has an industrial tradition which has today been replaced with other economic activities including transport, automobile and the construction industry.

Intense growth of Sesvete has resulted in a neighbourhood which lacks key amenities such as a human-scale centre, a central urban park, suburban landscaped parks, cycle tracks, sports fields and many other facilities. One of the key problems is traffic: Sesvete lacks good North-South connections and is cut off by the railway and major roads oriented in an east-west direction. It also lacks public facilities such as a music school, a municipal court, police and fire service buildings and other cultural assets. Although it is presently an incomplete municipality, it has the full potential to become a true neighbourhood.



Living Lab Plans



Living Lab
NBS Focus Areas
Urban Regeneration Areas
Existing green spaces
Water surfaces

3 Community-based urban farming and gardening
4 Aquaponics as soil-less agriculture for polluted sites
5 Capillary GI on walls or roofs
6 Making brownfields and renatured river corridors accessible
proGIreg funding
Other funding
7 Establishing protocols and procedures for environmental compensation at local level

0 800 1600m

The core of the LL will be the 128 000 m² brownfield site of the former meat processing factory Sljeme which is now owned by the City of agreb. It is located south of the railway line and is part of the economic zone that now lies between the older centre of Sesvete and the new neighbourhood development to the south in Novi Jelkovec with 11 000 inhabitants. Its location is adjacent to the present centre of Sesvete. It is connected to the railway and will be well served by the future road network.

Distinctive, tall silo buildings form a unique industrial heritage which is characteristic of the local identity of Sesvete. Several existing buildings will be reused to accommodate the public facilities which will be created for the local community.

In addition to the architecturally attractive heritage, the new part of the city will be green, sustainable and smart and will promote healthy and sustainable lifestyles, entrepreneurial opportunities and a “culture of sharing”.

As a start of the LL, the City of agreb is going to start a process of co-design with the local population to establishe criteria for
- a sustainable urban development,
- an urban environment supporting health and wellbeing,
- social networks that will enable innovation and exchange between citizens.

The criteria are going to be translated into a list of actions which will be implemented in the LL.

The NBS in the LL will include the creation of green spaces for inter-generational interaction.

The GI elements to be implemented will be co-designed with the local community to create enhanced social cohesion, reduced crime rates and to enable new entrepreneurial activities.

The former meat factory buildings will be transformed into a business hub and musical high school.

Current Situation

© City of agreb
Bureau for Physical Planning

northwestern part of the Living Lab:
main buildings

© City of agreb
Bureau for Physical Planning

southeastern part of the Living Lab:
silo buildings

© IPS

already existing gardens in the LL

Thanks for contribution to: Iva Bedenko, Matija Vuger, Nives Skreblin, Jelena Bule, Nives Mornar, Bojan Baletic, Mladen Josic

This project has received funding from the European Union s Horizon 2020 research and innovation programme under grant agreement no. 776528.

agreb
and its Focus NBS

Front Runner City

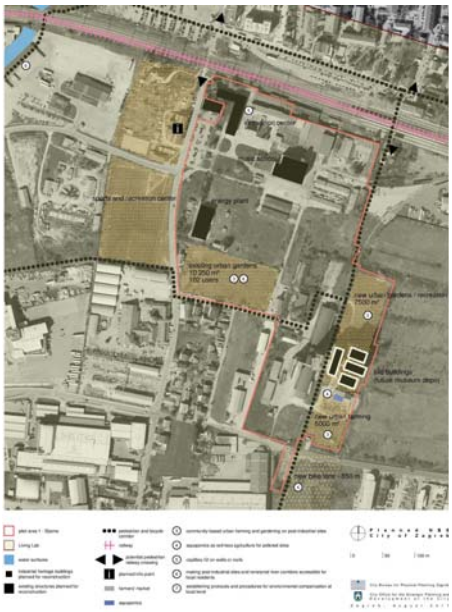
NBS no.5
capillary Green Infrastructure on walls and roofs

Reusing the former Sljeme meat processing factory for public facilities

Green walls and roofs are planned on the existing historic building in the Sljeme brownfield which served as the head office and restaurant. After refurbishment it will serve as a business innovation centre (HUB S).

For the NBS implementation 700 m² of the HUB s roof and 300 m² of the facade will be used. The rest of the roof area (500m²) will be covered with photovoltaic and thermo-solar panels to complement the planned geothermal energy source.

The results of this NBS implementation can be scaled up and used on the refurbishment of other historic buildings on the site, especially the silo.



NBS no.3
community-based urban gardening and farming on post-industrial sites

Developing urban gardens, additional green areas and an educational area for growing plants used as biomass

The project „City Gardens“ is an example of sustainable land use in agreb, improving the quality of life of citizens and the spatial quality and functions of the urban environment. The aim of the project is to enable citizens to produce food (vegetables and strawberries), herbs and flowers for their own needs. City gardens, besides providing space for healthy food and improving the home budget of citizens, also offer the possibility of traditional food production and coexistence with nature. They enable quality use of leisure time and augment the quality of life of citizens in a social, economic and healthy way. The „City Gardens“ project started in September 2013.

The Sesvete City Garden to be implemented within the LL area is one of twelve gardens in the City of agreb. It will cover an area of 10 300 m² and will have around 100 garden units. In a second phase it can be extended to a new area within the abandoned industrial site as well as by a nursery that is located in the north part of Sesvete which will become the main entrance to the future forest park area. At the nursery the neighbouring schools will have an educational school garden.

Four employees of the City Office for Agriculture and Forestry are in charge of the administrative tasks related to the implementation of the project (public tenders, keeping user lists, making contracts and liaising with garden site users).

The City Garden will be equipped with the necessary amenities such as storage crates, composters, water tanks and water pumps. In addition to individual units, there will be a common area for the meeting of the users which will be equipped with benches and tables, garden stools, cycle racks, grills and sports areas.

Food production will be strictly organic without the use of any chemical plant protection and fertiliser. Water supply for irrigation will be provided by solar pumps. Access routes and ramps will be useable for people with disabilities. A new communication point will be established within the HUB building in Sesvete, in order to facilitate the exchange between the planners, experts and community garden users (people of Sesvete).

NBS no.6
making post-industrial sites and renatured river corridors accessible for local residents

New cycle path as a connection of the Sljeme brownfield urban gardens with the neighbourhood of Novi Jelkovec

Within the agreb LL two green corridors will be developed to connect it with the Save river. The first includes a stream that leads from the nearby hill and runs through the LL area. It is also a fresh air corridor which enables fresh air to flow down from the surrounding hills.

Planned interventions include the construction of a cycle path that will connect the hills to the main cycling route that is to be built on the banks of the Sava River. Different ecosystems will be connected, including the forest in the North with the river ecosystem in the South. The riverbanks will be re-vegetated through livestock exclusion and assisted regeneration. The corridor will provide additional recreation zones for citizens and will be the backbone of the LL area connecting different NBS test sites.

The second corridor will be implemented on a local scale of intervention in the Sljeme focus area of the LL. Starting from the historic silo building, the key local landmark, it will establish a future broad green corridor/neighbourhood park that will connect the two main development areas of Sesvete. The new natural green corridor will, in the future, be extended South of the river Save. The pilot implementation will be a model for the character of the larger future corridor which will start from

© City Office for Economy, Energy and Environment protection

Core Stakeholders

uad helix model: local/city government, NGO green and blue Sesvete, a consortium of SMEs and experts from the University of agreb. Their role in the project is to propose an urban regeneration approach, GI design standards (university), create local interest, acceptance and involvement (NGO), enable the planning framework for the transformation of the brownfield site and beyond (city and local gov.) and explore business models for promoting and upscaling the Green tech and GI solutions (SME).

The City Office for Strategic planning and Development of the City, is responsible for coordination and encouragement of regional development, strategic projects and programmes, spatial data and plan development, urban statistics, etc.
It leads the implementation of the LL and organises the proGIreg final conference.
It is involved in several work packages (WP2, WP4, WP5) and the promotion of results by training events and training modules with global outreach.

Green and the Blue Sesvete was established to give support to the Green and Blue Sesvete Project, which insists on environmentally friendly, sustainable and organised growth. It works exclusively on volunteer work and contribution of its members.
They support the spatial analysis and co-design processes, and are involved in implementing the pilot LL. Furthermore, they contribute to the training events and MOOCs training modules.

City of agreb Bureau for Physical Planning is an independent legal entity, not linked to the administration, but working closely with the offices for Strategic Planning and City Development. It is responsible for making urban planning documents, preparing competitions, collecting spatial data, etc. The Bureau develops two main urban planning documents: A Master Plan for the City of agreb and a Master Plan for Sesvete.

The University of agreb - Faculty of Architecture plays a key role in planning, design and participation processes for NBS, in particular spatial analysis and co-design processes, preparing the implementation of the pilot LL. In addition, they contribute to the training events and MOOCS training modules, as well as organize needed workshops, international meetings and the final conference.

Thanks for contribution to: Iva Bedenko, Matija Vuger, Nives Skreblin, Jelena Bule, Nives Mornar, Bojan Baletic, Mladen Josic

CASCAIS AMBIENTE

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 776528.

proGIreg

Cascais

and its Green Infrastructure

Follower City

Hidden Potential

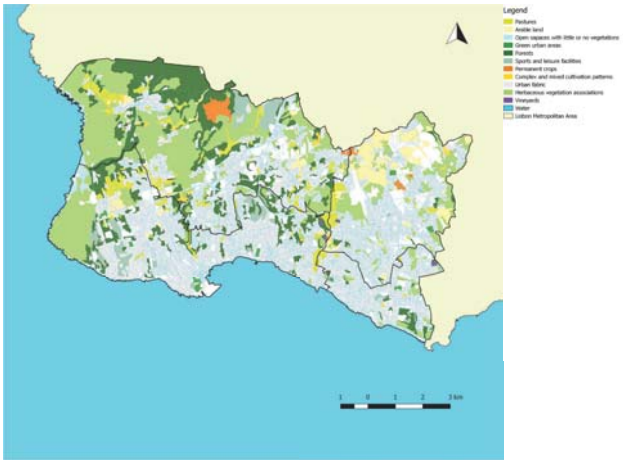
Cascais is a coastal municipality in the Lisbon Metropolitan Area. With an area of 97 km² and over 30km of coastline, its landscape is protected by the UNESCO.

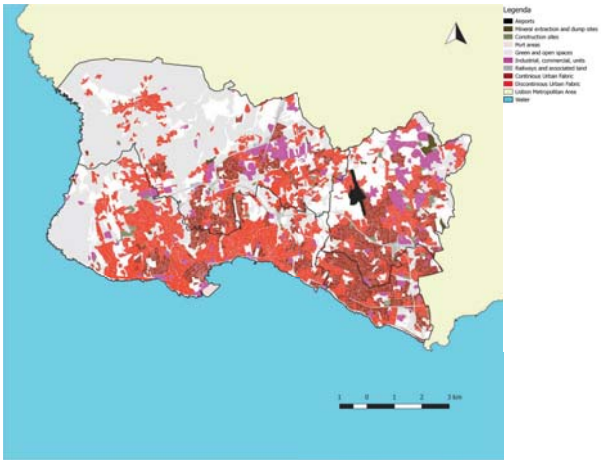
Over the last 40 years, Cascais has experienced high demographic and urban growth. As the increase in construction occurred in an uncoordinated way the result was a fragmentation of urban centers as well as an excessive and inappropriate use of key ecological areas. Therefore, Cascais might not face post-industrial challenges, but instead rather chances to upgrade GI areas of potential by means of Nature-Based Solutions.

Cascais' Ecological Structure integrates the following Municipal Master Plan qualification categories:

1. Fundamental Ecological Structure (rural soil), which includes:
a) Level 1 Natural Areas (National Ecological Reserve, National Agricultural Reserve and Sintra-Cascais Natural Park areas under protection);
2. Complementary Ecological Structure (rural soil), which includes:
a) Level 2 Natural Area (areas with high or very high soil, vegetation or landscape value);
b) Rural Agglomerates (Limited Intervention areas of the Sintra-Cascais' Park Land Use Plan)
3. Urban Ecological Structure (urban soil), which includes:
a) Level 3 Natural area (National Agricultural Reserve areas in urban context);
b) Production and playground green spaces;
c) Protection and conservation green spaces;
d) Infrastructure protection green spaces.

Green Infrastructure





© Cascais Ambiente image

Quinta do Pisão in Sintra-Cascais Natural Park, with woodlands and meadows, a part of an Agri-park.

© Cascais Ambiente image

Community garden, surrounded by green areas and residential buildings.

© Cascais Ambiente image

Old Vineyard, in one of the historical farms of the Carcavelos Wine.

Thanks for contribution to: Teresa Ribeiro, Helga Gonçalves

proGIreg

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 776528.

Cascais

and its Potential NBS

Follower City

Regeneration Challenges

© Cascais Ambiente image

Agricultural fields, part of the national agricultural reserve unused and looking forward to urban intervention.

© Cascais Ambiente image

Abandoned fields near a social neighbourhood available for a community garden.

© Cascais Ambiente image

Stream after a fire needing intervention.

Potential NBS

NBS no.3
community-based urban gardening and farming on post-industrial sites

- Attracting private owners to become our partners and share land with the project will be crucial. (The local Land bank will enhance sharing and renting available land)
- Upscaling of urban agriculture, with leisure purposes and just for the families own consumption, to local bussinesses.
- Create a local brand “Lands of Cascais local product “, and promote production from proGIreg vegetable garden, as well as Carcavelos Wine, Tires prision Vegetable Garden and Quinta do Pisão.

expected benefits:

- Learn new protocols for NBS, considering the productivity of the GI and creating green jobs
- Learn about Business models for Green Infrastructure, in a circular economy way
- Tackling administrative and legal barriers to develop private/ public partnership
- Learn how to attract private landowners, social-entrepreneurs and stakeholders and how to establish protocols with them

NBS no.6
making post-industrial sites and renatured river corridors accessible for local residents

- Renature river corridors creating recreational areas, with natural engineering.

expected benefits:

- Improve accessibility to river corridors creating multifunctional areas ecologically sustainable.
- Promote biodiversity and wildlife.

NBS no.8
pollinator biodiversity improvement activities and citizen science project

- Make our community gardens and green corridors more pollina tor friendly to attract local pollinator species.

We aim to benefit from local biodiversity to help food production. The awareness of the population is crucial for this purpose. Engaging schools, and other communities in workshops will provide a new understanding for pollinators role in the ecosystem.

expected benefits:

- Reduce the use of domestic pesticides;
- Promote local biodiversity;
- Engage the community and schools in a new awareness approach for pollinators protection;
- Increase beekeeping.

© Cascais Ambiente image

Illegal gardens on private lands.

© Cascais Ambiente image

Marianas riversides.

© Cascais Ambiente image

Passion fruit flower on our community gardens.

Thanks for contribution to: Teresa Ribeiro, Helga Gonçalves

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 776528.

Cluj-Napoca

and its Green Infrastructure

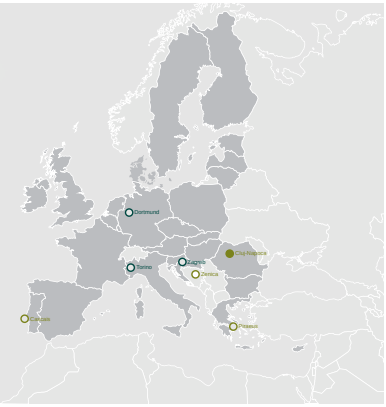
Follower City

The Challenge to Connect

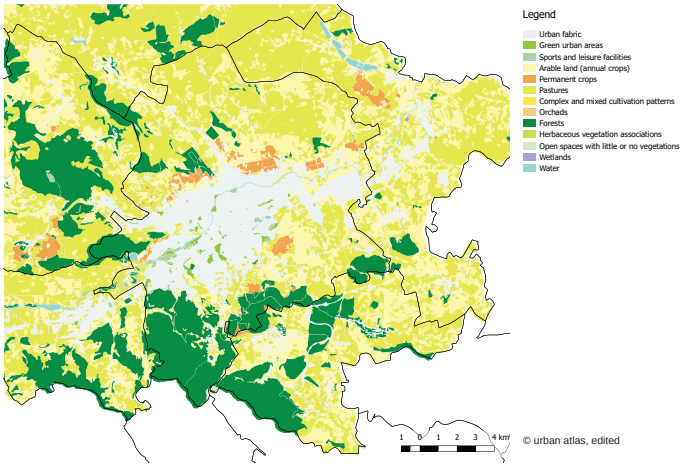
Cluj-Napoca (322 572 inhabitants) is the second largest city in Romania. Built upon the success of its university tradition and its strong urban development ambitions, the city has seen a continuous transformation process towards development of a new urban identity in the past decade, at the regional and national level, as a city of innovation, business development, youth and culture.

The regeneration needs of the city face three significant challenges, created by the three structural development zones which bisect the city in the East-West direction. Firstly, the city is crossed by the industrial and rail axis with large brownfield sites, comprising highly degraded areas, abandoned railway structures and derelict industrial land. These now create a strong division within the urban fabric and form a barrier towards the North, creating housing enclaves which need improvement. Secondly, the blue-green axis of the Someș River intersects the industrial and rail axis, creating challenges in terms of pollution hazards, low quality waterfront areas and difficulties for creating new public green areas towards the North of the city. Thirdly, strong opportunities are provided by the wooded area of the Făget Forest located in the South Western part of the city, with large green areas extending to the South.

Strategic interventions are planned for these areas, through an integrated approach in which the municipality's GI provides the backbone for testing new models of urban regeneration using NBS. Firstly, developing an integrated municipal system of GI represents an important planning task for the Cluj-Napoca which aims at working towards the conservation, development and connection of existing and planned GI i.e. a green ecological corridor in the Southern part of the city, integrating the large forests and green spaces and the development of bike routes which interconnect major green areas. Secondly, the vacant and derelict industrial areas are now the subject of future regeneration schemes, aimed towards their redevelopment with the help of new forms of economic activity along the waterfront of Someș River; thus consolidating it and allowing the connection of the city with its wider metropolitan area via NBS.



Green Infrastructure



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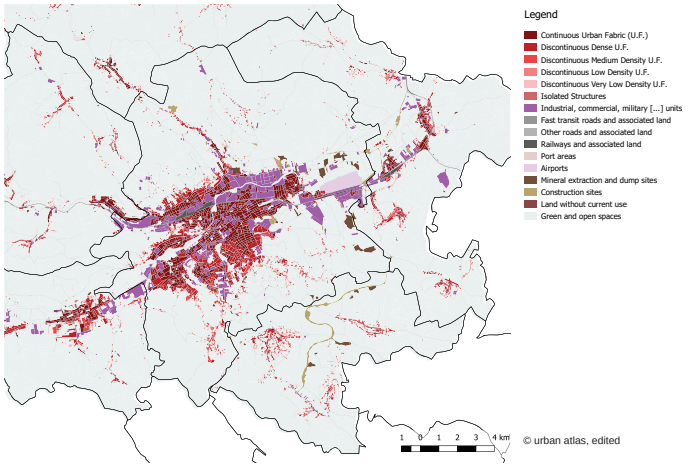

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The old Casino building positioned in the middle of the Central Park. Now serves as an Urban Cultural Centre.

© Cluju.ro

A sea of hammocks in the Central Park, during the Hungarian Cultural Days

© Radiocluj.ro

Grigorescu beach on the Somes river banks, during "Vamos a la Playa" event

Thanks for contribution to: Adrian Răulea

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 776528.

Cluj-Napoca

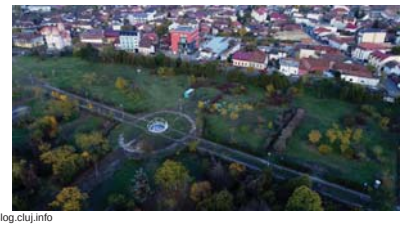
and its Potential NBS

Follower City

Regeneration Challenges

© Ziardecluj.ro

The former Heavy Machinery site, now derelict



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Former railworkers park, now brought back to the Municipality will be rehabilitated

© Ziardecluj.ro

The park sits at the confluence of the Somes river with the Nadas and is now in decay

Potential NBS

NBS no.5
capillary GI on walls and roofs

In the participatory budgeting process organized by the municipality of Cluj-Napoca in 2017, one project consisting in capillary GI on walls and roofs was among of the winners, considering the votes received. The city has allocated the necessary money for the implementation, now the project is in tendering phase and will be implemented in the beginning of next year.

expected benefits:

Green walls and roofs installed on the public buildings available, will greatly contribute to the regeneration of the surrounding areas. The neighbourhoods will be more pleasant, the energy efficiency of the buildings will greatly improve and the citizens will benefit of the new green spaces.

NBS no.6
making post-industrial sites and renatured river corridors accessible for local residents

The blue-green axis of the Someș River runs through the Metropolitan Area from East to West, and has the highest potential for GI-led improvement of quality of life for the citizens in Cluj-Napoca and the metropolitan area. Its regeneration, within the city, has made the object of a recent international contest („Rethinking Someș"), and in the medium to long-term, the priority represents reconnecting the river with the territory, and valorizing its ecological value for the benefit of the local communities.

Regenerating the river corridor as a structuring blue-green axis for the entire Metropolitan area will offer the possibility of providing neighbourhoods, especially in the dense areas (Florești, Cluj, Apahida), with improved GI accessibility and new leisure opportunities.

expected benefits:

Making the river banks accessible and inter-connecting the neighbourhoods in proximity of the Someș river will contribute not only to increased mobility, activity rate and overall better health of the citizens, but it will also provide a pleasurable soft mobility alternative to the east-west main transport corridor, thus reducing environmental impacts of mobility in the area.

NBS no.3
community-based urban gardening and farming on post-industrial sites

There is a high environmental and socio-economic potential for community-based productive valorisation of land in Cluj-Napoca. Recent experiences such as the „La Terenuri" Common Space in Mănăștur demonstrated both the demand as well as the capacity for involvement, co-design and co-implementation of urban gardens as productive public spaces.

The city of Cluj-Napoca is crossed by a rail axis, flanked by industrial areas, some of them regenerated/ reused, and others which fell in disuse and represent an important priority for urban regeneration. Through an integrated approach to sustainable redevelopment of polluted/ brownfield areas, the Cluj partner will aim at creating a long-term vision for re-valorizing its very central land assets through both productive and leisure functionalities.

expected benefits:

Co-production of greening post-industrial sites represents a local process which will create positive results from many perspectives – on the environmental level, it will regenerate the soil through safe agricultural techniques and provide new ecological value to the city; on the social level, it will represent an opportunity for community-development, strengthening social bonds, providing spaces for leisure and common activities and thus improving health and well-being (including mental) as well; lastly, on the economic side, local adaptation and testing of this NBS will open up new job opportunities, especially for disadvantaged groups and local communities.

Thanks for contribution to: Adrian Răulea

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 776528.

Piraeus

and its Green Infrastructure

Follower City

A Dense City in Need for Intervention

Piraeus is situated in the Metropolitan Area of Attica where almost 45% of Greece's population is concentrated. It is the most important port of the region, Greece and the whole East Mediterranean coast.
Piraeus is a densely populated city with high port related business and tourist activity, the latter of which is expected to be further increased considering the interest of the port of Piraeus in investing on infrastructure developments that will facilitate the growth of the cruise market. Commercial units which are clustered in city centre faced an increased demand of being supplied with products efficiently, at a low cost and in a timely manner.

The Municipality of Piraeus constitutes the 3rd largest municipality in Greece with a population of around 180 000 inhabitants and it is home to Greece's main port, which is the 8th European container port handling 3.1 million TEUs in 2013, the 3rd cruise port in the Mediterranean with more than 2 million cruise visitors and the main Eastern European car port with around half a million cars handled in 2013. Piraeus is a significant industrial centre and the largest commercial centre within the Greek Economy. The city is characterised by a diverse range of integrated activities which include administration, education, culture, business, manufacturing, trade and tourism (OECD - Regional Development Policy Division, "Urban Trends and Governance", 2014, Case Study of Athens – Attica, Greece).

However, the City suffers from the consequences of chronic urban problems including population shrinkage, though it remains one of Europe's most densely populated municipalities (15 000 inhabitants/km²).
The main land use in Piraeus is urban built development. Road networks and industry occupy a large percentage of the total area whilst green areas, sports and recreation areas are very small (2.12% of the municipality). In addition, given the construction situation in Piraeus, green areas are scattered and inadequate and there are no plots available for the creation of new green spaces within the city. This intensifies the urban heat island phenomenon with negative consequences for public health and the environment.

Green Infrastructure

Legend
- Urban fabric
- Green urban areas
- Sports and leisure facilities
- Arable land (annual crops)
- Permanent crops
- Pastures
- Complex and mixed cultivation patterns
- Orchads
- Forests
- Herbaceous vegetation associations
- Open spaces with little or no vegetations
- Wetlands
- Water

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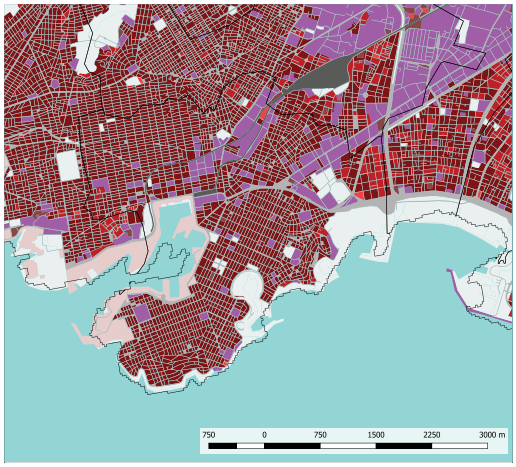

Legend
- Continuous Urban Fabric (U.F.)
- Discontinuous Dense U.F.
- Discontinuous Medium Density U.F.
- Discontinuous Low Density U.F.
- Discontinuous Very Low Density U.F.
- Isolated Structures
- Industrial, commercial, military [...] units
- Fast transit roads and associated land
- Other roads and associated land
- Railways and associated land
- Port areas
- Airports
- Mineral extraction and dump sites
- Construction sites
- Land without current use
- Green and open spaces

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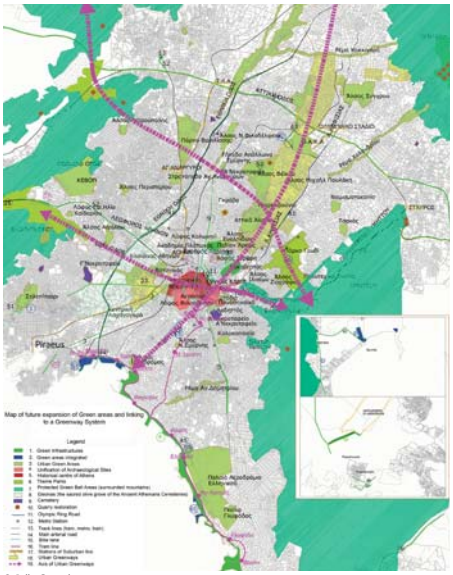
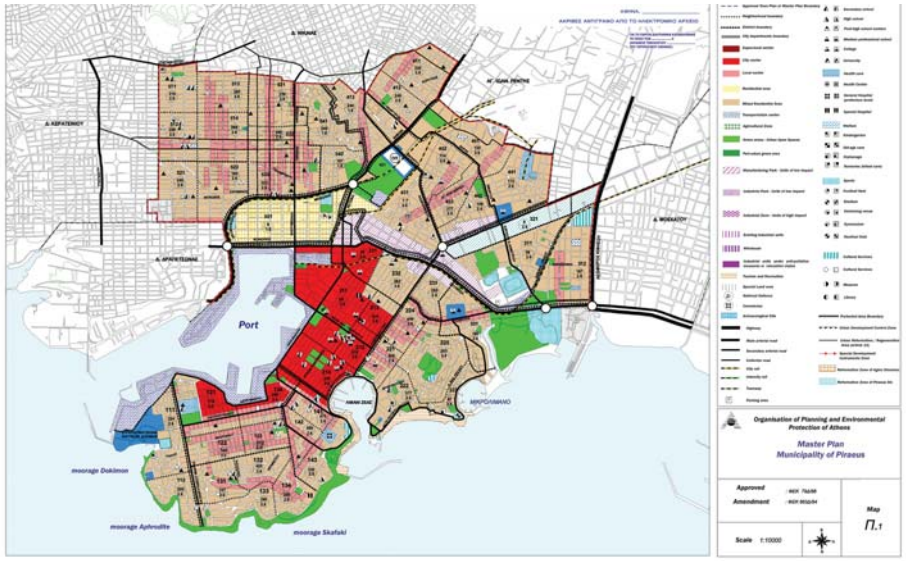


© Julia Georgi

The Green Infrastructure System planned by the Ministry of Environment in Athens Web: one can see the willingness to link the green routes to improve the city's air quality, its microclimate and biodiversity.



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The Master Plan of the municipality of Piraeus: one can see the several uses as well as the Urban and the Periurban Green Spaces.

Thanks for contribution to: Julia Georgi

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 776528.

Piraeus
and its Potential NBS

Follower City

Regeneration Challenges

© Municipality of Piraeus

Piraeus is a major industrial city. It was one of the main industrial development cites in the region, but during the last decades its industrial function has declined. The picture above is one example of those post-industrial areas that should be regenerated.

© Municipality of Piraeus

The city has grown considerably since World War II, with many new factories on its outskirts (mainly for engineering and chemical industries). The picture shows an abandoned building in one of those post-industrial areas.

© Municipality of Piraeus

The Kifisos river has been running along ancient sites since the 5th century BC. For instance, one can assume that Cimon (ancient statesman of Athens) dug channels for watering to Plato's Academy from the Kifisos river and thus "converted the Academy from a waterless and arid spot into a well-watered grove". Today, the Kifissos as well as the Ilissos Rivers have been transformed into avenues, and their tributaries into sewers of Athens.

Potential NBS

NBS no.3
community-based urban gardening and farming on post-industrial sites

The plan is to re-integrate derelict pre-industrial land for urban regeneration to degraded urban environments. These sites are significant opportunities to create new Green Infrastructures in the city of Piraeus.

expected benefits:

The new upgraded area can help reducing inequalities in environmental justice and offers benefits for mental and physical health, improving microenvironment and wellbeing.

NBS no.5
capillary GI on walls and roofs

There are several old and modern buildings as well as 'blind' walls where green roofs and vertical gardens can be designed to support existing vegetation in order to improve a building's performance.
Additionally, green roofs can be particularly effective in the dense, urban areas of Piraeus, where they can compensate the loss of productive landscape at ground level.

expected benefits:

Through the implementation of green roofs and walls, Piraeus is expected (1) to attract new types of substrate, thus improving the local value chain in a circular economy, (2) to improve its green spaces in the city, strengthening biodiversity inside the city.

© Municipality of Piraeus

NBS no.6
making post-industrial sites and renatured river corridors accessible for local residents

As rivers were an important locational factor for early industrialisation, old industrial areas are often part of river corridors, such as the Kifisos river. Nowadays, the river can be renatured to achieve a better water quality and to serve as a wildlife corridors full of biodiversity. There is also the possibility to upgrade the quality of life for urban residents. However, the question of how to connect these rivers and post-industrial sites, which have been in the backyard of cities for decades, has yet remained unresolved , which is why this can be a great challenge for the municipality of Piraeus.

expected benefits:

The new connections will help citizens to access greenspace and offer options for physical activities.
Furthermore this NBS will interlink marginalised areas with other parts of the city to reduce isolation.

© Municipality of Piraeus

Dilaveri Garden

© Municipality of Piraeus

Kifisos River

Thanks for contribution to: Julia Georgi

City of Zenica

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 776528.

proGIreg

Zenica

and its Green Infrastructure

Follower City

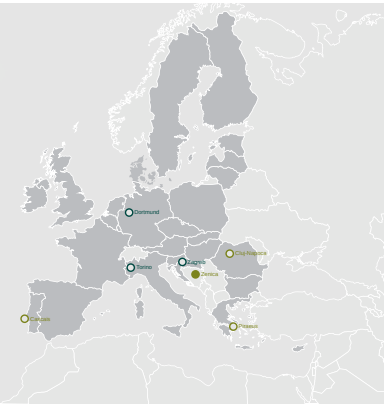
the Impact of Industries on the City's GI

The city of Zenica takes up the area of 558,5km². It is located in the River Bosna valley at the altitude of 316 m. Its mountains reach the height of 1.304 m with Tvrtkovac as the highest mountain peak. Zenica is situated 70 km north from Sarajevo.

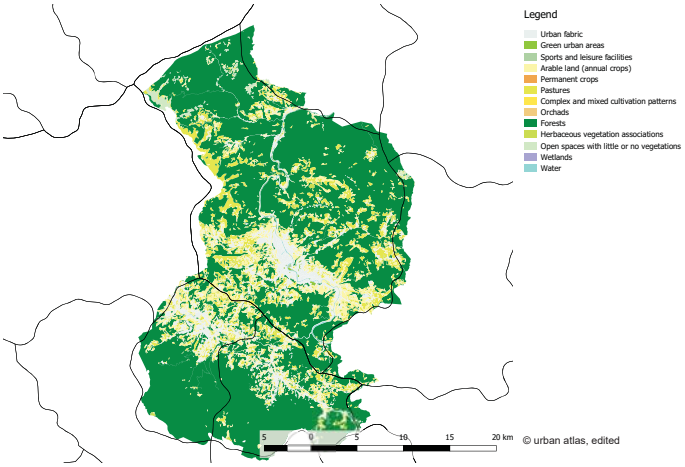
The city is an administrative, political, economic, cultural and sports seat of Zenica-Doboj Canton, composed of 12 municipalities. It is estimated that around 115 000 people live in the city at present. The population is composed of various ethnic groups, cultures, faiths and traditions interwoven with the long-standing tradition of a community spirit in former Yugoslavia.

Zenica was called a steel metropolis, the capital of mining and metal processing industry. Steel and coal, as well as metal processing still remain its main industries, though significantly accommodated to the present market conditions. The steel production is organized as a manufacturing unit of the world largest steel producer ArcelorMittal. Other industries are increasingly visible as a result of the process of setting up a number of small and medium-sized companies.

Kamberovića field is the first circle of Zenica's green infrastructure. It is a skillfully designed oasis, decorated with extremely beautiful bushes and trees, divided by walking, jogging and cycling paths that follow the river line and offer the guests the best possible way to get a first impression of the town and its inhabitants. It is the epicenter of all recreational facilities in the town with the City Arena, a stadium, tennis courts and gyms. The traffic jams are not felt at this part of the town since the recreational routes stretch along the river and the bridges providing a good isolation from the urban area.
The city is located in a basin of river Bosna and surrounded by hills and small mountains. Configuration of the land does not go into the favour of the city expansion. We have a very limited land for any major makeovers. On top of that, the city is a home to world's largest producer ArcelorMittal which takes 184ha of the city's territory. Our business zone is located only a few kilometres from the center and takes up 33,64 ha of land. The garrison take us up 16,24ha of land and prison about 17ha of land respectively. Presence of heavy industry which continuously pollutes the city and limited availability of the land represent major urban regeneration challenges.



Green Infrastructure



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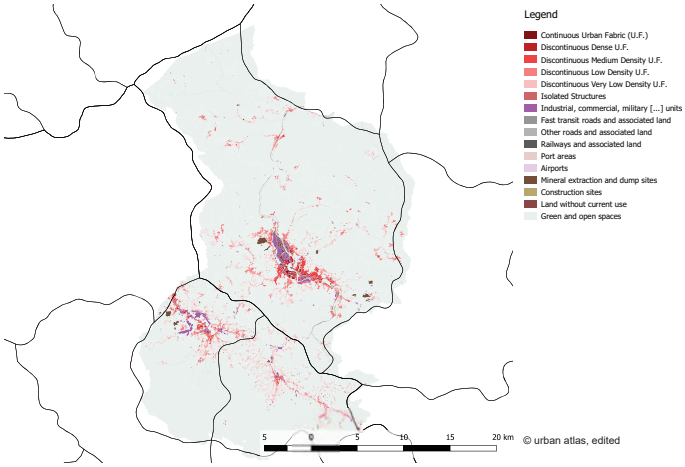

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© ZEDA - Zenica Development Agency

Školska Street - Urban tree canopy in of the streets in the city.

© ZEDA - Zenica Development Agency

City Boulevard - Bioswales on the city's Boulevard.

© Naša Riječ Zenica

Kamberovića field is protected green urban area within the city with playgrounds, sports fields, jogging, walking and cycling paths along river Bosna.

Thanks for contribution to: Amra Mehmedić, Mirza Sikiric, Emir Caplja, Lejla Brljevac

proGIreg

City of Zenica

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 776528.

proGIreg

Zenica

and its Potential NBS

Follower City

Regeneration Challenges

© Emir Čaplja

Kamberovića field
Flooding in urban area due to heavy rains

© ZEDA - Zenica Development Agency

Socially deprived settlements
Area nearby ArcelorMittal company.

© ZEDA - Zenica Development Agency

Business Zone Zenica 1
Need for more green infrastructure for the remaining free space in the business zone.

Potential NBS

NBS no.5
capillary GI on walls and roofs

Unsanitary landfill of industrial waste which is still partly in use by ArcelorMittal.
This area has a great potential for recultivation of the land, which is currently unuseful and dangerous. Current landfill site can be put in a use for local communites.

expected benefits:

- Planting of trees for prevention of land sliding
- Space for leisure activities
- Improvement of quality of life for local community

© City of Zenica

Industrial landfill Rača

NBS no.6
making post-industrial sites and renatured river corridors accessible for local residents

River banks need intervention

expected benefits:

- New cycling and walking trails
- Upgrade of quality of life for residents
- Urban regeneration

© ZEDA - Zenica Development Agency

River Bosna

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

Several communities are under direct influence of ArcelorMittal and have contaminated soil.

expected benefits:

- New approach to food production
- Sustainability for households
- Healthier products

© Emir Čaplja

Zenica Suburbs

Thanks for contribution to: Amra Mehmedić, Mirza Sikiric, Emir Caplja, Lejla Brljevac

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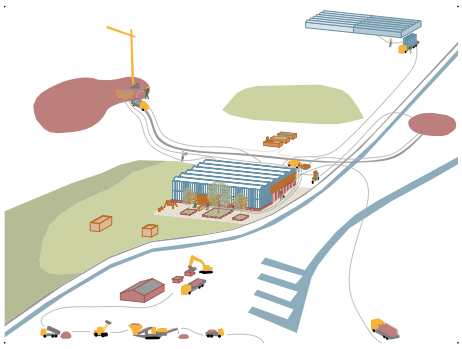
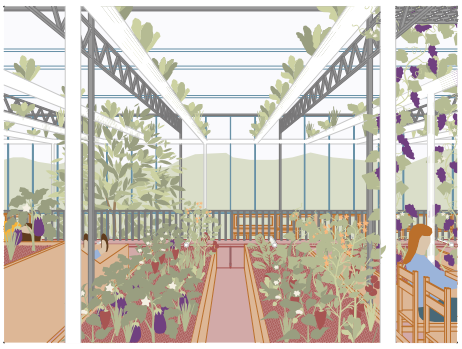
Dortmund

Front Runner City

Productive Community Center - Masterthesis by Luisa Ropelato

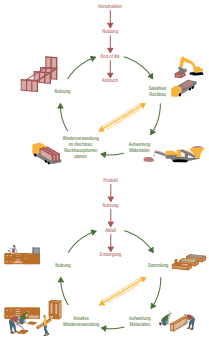




Neighbourly building materials

The Productive Community Center aims to reuse local building materials from the Huckarde neighbourhood by encouraging a large participation process of the local citizens. One key aspect for the implementation is the 'Map of Neighbourly Building Materials' which I created to locate all available building materials within a 2,2km radius. As for now, it gives us information about the building possibilities for the community center itself but I suggest it to be extended and updated by the inhabitants for future construction projects.

In the following, some examples for reused building materials at the Productive Community Center: Firstly, brick rubble (from former brick buildings located next to the site) can be used as concrete aggregate for those prefabricated elements which shape the supporting structure of the building. Secondly, the current waste wood surplus in combination with the communal recycling centre being located on the other side of the street offers a great opportunity to collect wood (and windows, doors and plants) and use it e.g. for non-load bearing walls, possibly also designing them during a collective building workshop. Lastly, two greenhouses from soon-to-be closed nurseries can be dismantled and rebuilt at my site.

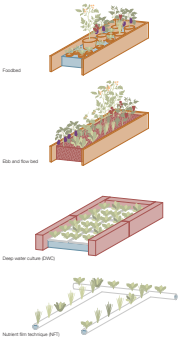


Alternative growing methods

The Productive Community Center is designed as a landscape of plants, shrubs and trees growing on the floor, walls and ceiling and finally extending into the exterior space.

The upper floor is connected with the ground floor through a two-storied space in the south, which works as a climatic buffer zone. The two floors are not only spatially interwoven but also thematically by hydroponics. The plant cultures are designed according to the difference in their individual height and growing method which results in a great variety. In the centre options for interaction are arranged. The produced food is sold next to entrance.

The building connects not only to the landscape within, but also to the surrounding landscape. For instance, the building links up with the south by several landscape phases: a lively forecourt, followed by a community garden and finally a surrounding permaculture garden. The whole landscape system is designed in such a way, that – either entering it from Huckarde or the Emscher bike route – it represents the evolution from a near-natural food forest via the designed permaculture orchard to the artificial aquaponics system in the Productive Community Center. The boundaries are not strictly defined but in an organic flow.

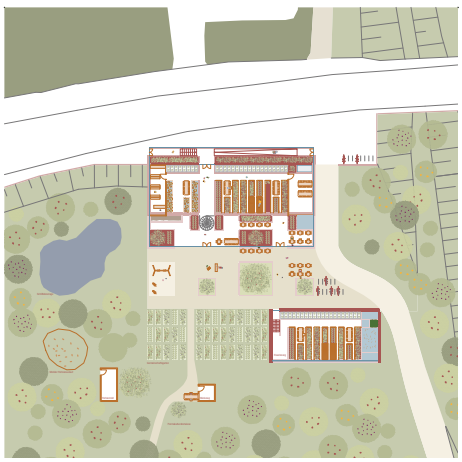


Strengthening the community

The Productive Community Center offers various opportunities for interaction and cooperation. Within the centre I created a community space with an open kitchen, which on the one hand offers local citizens to bond with other people from the neighbourhood and on the other hand provides the chance to discover locally produced food or experience further training through literature. The aquaculture placed on the edge of the community space makes the room unique. From here the plants in the building get supplied with water and nutrients. A core team from the neighbourhood takes care of the aquaponics system. Their work is supplemented by volunteers who help spontaneously.
In the west the workshop for the reuse of building materials is located. Building materials can be donated, edited and you can ask for necessary expertise. This way available materials and knowledge are shared and possibilities for reusing local building materials are spread. This development is supported by the 'Map of Neighbourly Building Materials', the enclosed catalogue and the abstracts about the recyclability of building materials. On the upper floor the seminar room offers possibilities for the interchange of knowledge, e.g. seminars about aquaponics, permaculture and recycling possibilities.
The community centre is usable throughout the year due to the climatic separation of the rear part of the ground floor.

Map of neigbourly building materials (extract)

Site plan



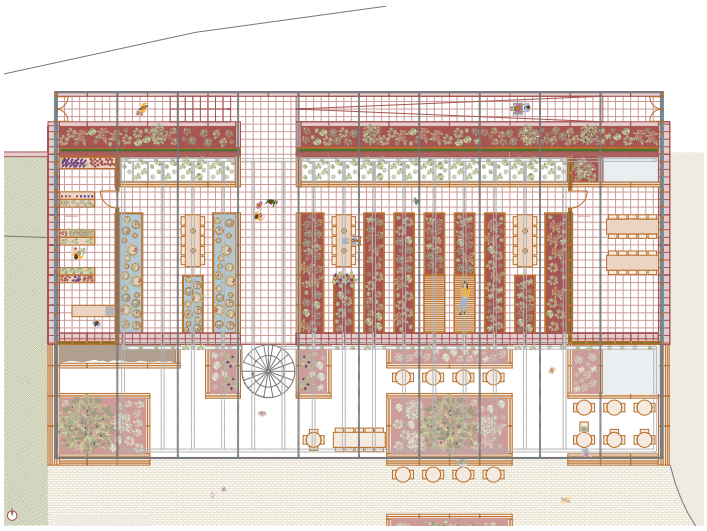
Plan of outside space

proGIreg

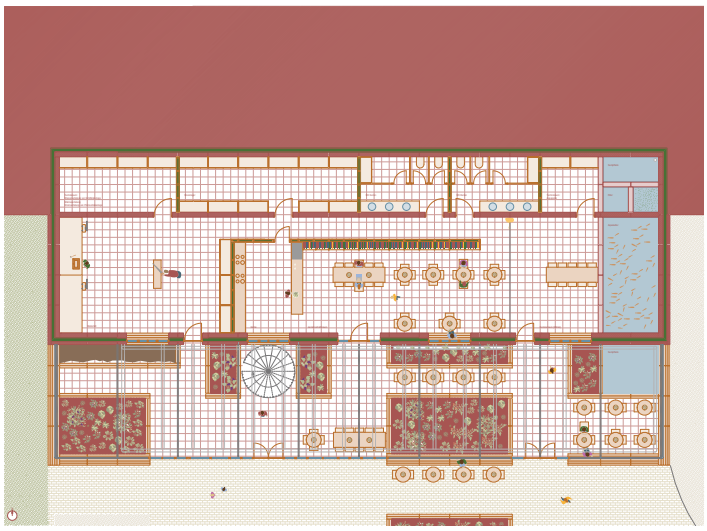
Dortmund

Front Runner City

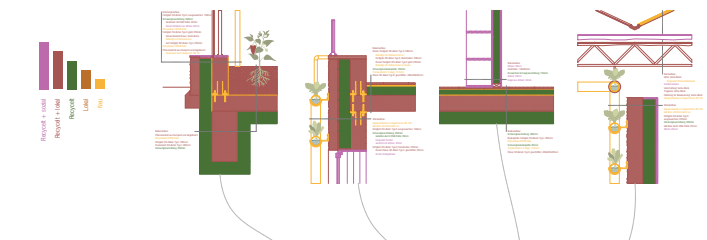
Productive Community Center - Masterthesis by Luisa Ropelato



Floor plan - Upper floor
Scale 1:100

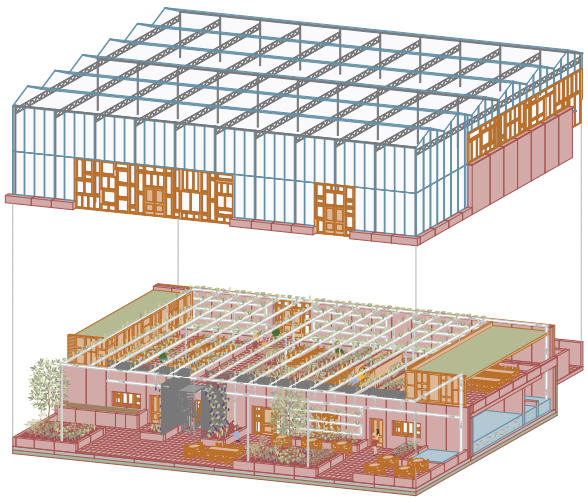


Floor plan - Ground floor
Scale 1:100

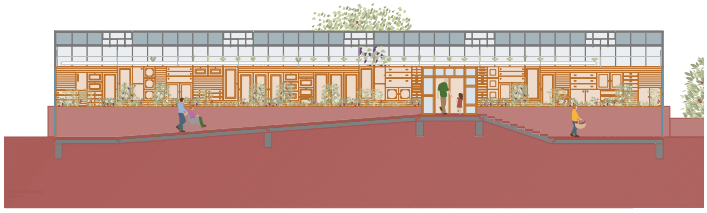


Details
Scale 1:20

Cross section
Scale 1:100



Isometry



Entrance section
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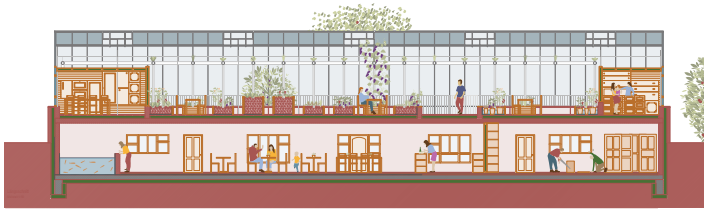

Longitudinal section
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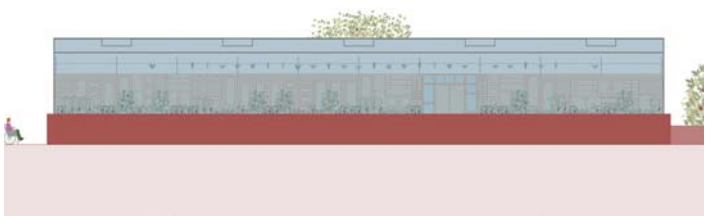
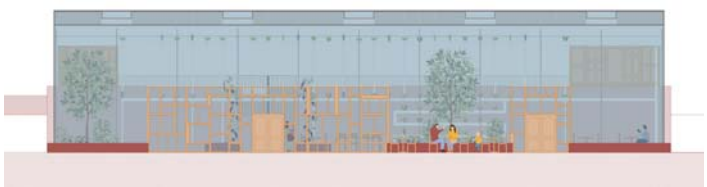


North view
Scale 1:100



South view
Scale 1:100

RWTH AACHEN UNIVERSITY | RWTH AACHEN UNIVERSITY

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Kick-off Conference

Dortmund, 25/09/2018

www.progireg.eu

Welcome to Dortmund!

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Time	Programme
	Welcome and Introduction
9:30	**Urban green infrastructure: success stories and future ambitions** *Ullrich Sierau, Lord Mayor of the City of Dortmund*
10:00	**Nature-based solutions in the EU strategies for inclusive urban regeneration** *Ugo Guarnacci, European Commission, Executive Agency for Small and Medium sized Enterprises (EASME)*
10:20	**Making nature-based solutions work: Horizon 2020 innovation action proGIreg** *Axel Timpe, RWTH Aachen University, proGIreg coordination*
	Living Labs: cities in research and innovation
10:45	**Promises and challenges of a new research infrastructure** *Stefan Böschen, proGIreg Ethics Board / RWTH Aachen University HumTec*
11:00	**Sustainable innovations: the role of local governments** *Barbara Anton, ICLEI European Secretariat*
11:15	**Making our city a laboratory for innovation: Discussion panel of city representatives** *Alessandra Aires, City of Turin* *Andreea Muresan, City of Cluj-Napoca* *Thomas Jacob, City of Hamburg/CLEVER cities* *Barbara Anton, ICLEI European Secretariat/proGIreg*
12:00	(light) Lunch

Time	Programme
12:50	**After-lunch walk in the Dortmund Living Lab with guided tour of Hansa Coking Plant post industrial site**
	Living Lab Dortmund-Huckarde
14:45	**From old industries to new gardens: Emscher Green Corridor and International Garden Exhibition Metropole Ruhr** *Stefan Thabe, City of Dortmund – Urban Planning*
15:10	**Productive city: ideas for community-based aquaponics and urban gardening** *Jan Bunse, die Urbanisten e.V*
15:30	**Challenges and solutions: proGIreg Cities' Market Place** Front runner and follower cities present their challenges, Living Labs and planned nature-based solutions at market stands with posters, models and information material
16:40	Coffee break
17:00	**Making performance measurable: nature-based solutions beneft assessment** *Carlo Calfapietra, Consiglio Nazionale Delle Ricerche Italy*
17:20	**Making nature-based solutions a business: replication strategies through business models** *Bernd Pölling, South Westphalia University of Applied Sciences*
17:40	**Concluding remarks and prospects for the proGIreg project** *Frank Lohrberg, RWTH Aachen University*
18:00	*End of conference*

Urban green infrastructure: success stories and future ambitions

Ulrich Sierau, Lord Mayor of the City of Dortmund

Nature-based solutions in the EU strategies for inclusive urban regeneration

Ugo Guarnacci, European Commission, Executive Agency for Small and Medium sized Enterprises (EASME)

Making nature-based solutions work: Horizon 2020 innovation action proGIreg

Axel Timpe, RWTH Aachen University, proGIreg coordination

Living Labs: promises and challenges of a new research infrastructure

Stefan Böschen, proGIreg Ethics Board / RWTH Aachen University HumTec

Sustainable innovations: the role of local governments

Barbara Anton, ICLEI European Secretariat

Making our city a laboratory for innovation: Discussion panel of city representatives

Alessandra Aires, City of Turin/proGIreg
Andreea Muresan, City of Cluj-Napoca
Thomas Jacob, City of Hamburg/CLEVER cities
Barbara Anton, ICLEI European Secretariat/proGIreg

Lunch break

© Anneke Wardenbach, Stadt Dortmund

After-lunch walk in the Dortmund Living Lab & visit of Hansa Coking Plant

12:50

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From old industries to new gardens: Emscher Green Corridor and International Garden Exhibition Metropole Ruhr

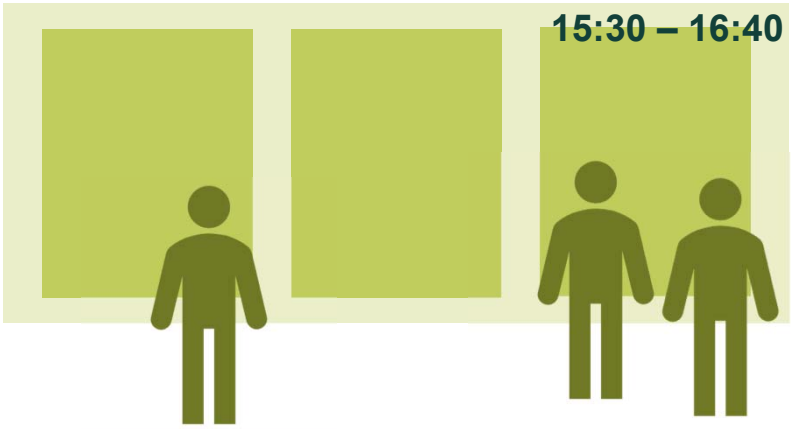
Stefan Thabe, City of Dortmund – Urban Planning

Productive city: ideas for community-based aquaponics and urban gardening

Jan Bunse, die Urbanisten e.V

Challenges and Solutions: proGIreg Cities' Market Place

15:30 – 16:40



Coffee break

16:40 – 17:00

Making performance measurable: nature-based solutions beneft assessment

Carlo Calfapietra, Consiglio Nazionale Delle Ricerche Italy

Making nature-based solutions a business: replication strategies through business models

Bernd Pölling, South Westphalia University of Applied Sciences

Concluding Remarks and Prospects for the proGIreg Project

Frank Lohrberg, RWTH Aachen University

Thank you!

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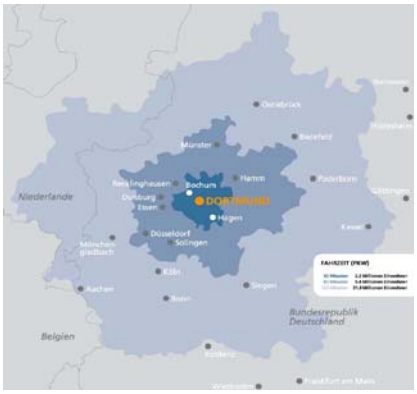
Urban Green Infrastructure:

Success Stories and Future Ambitions

Dortmund - Location and statistical numbers

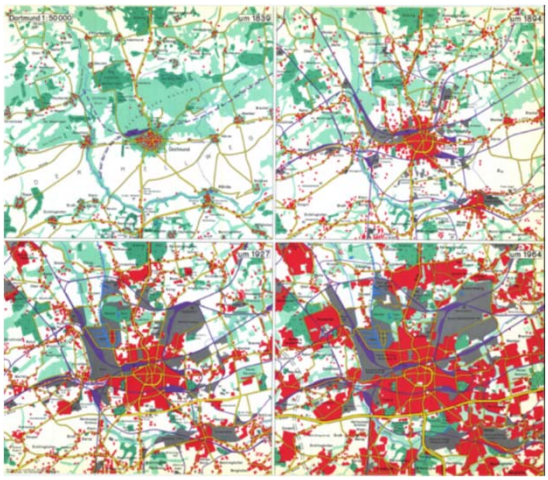
Stadt Dortmund



- centrally located within Europe
- part of the Rhein-Ruhr- Region with about 11 million inhabitants
- Germany´s 8th largest city with 601,780 inhabitants (12/2017)
- city area: 280.7 km²
- 3 inner city urban districts, 9 outer districts with large green areas

Dortmund - City development 1830, 1894, 1927, 1964

Stadt Dortmund

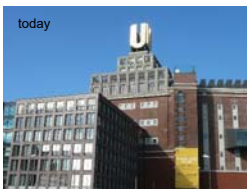


- coal, steel and beer production and its ancillary industries characterized Dortmund since ~1850
- rapid urban development was closely connected with economic growth

3

Dortmund - City of structural change

Stadt Dortmund



Decline of former core industries:
in 1987: last coal mine closed
in 2001: last steel mill closed

Since 1960 Dortmund has converted more than 1,100 ha of former industrial sites into new urban areas

→ **to convert about 10% of Dortmund´s settlement area has been a challenge and a great opportunity for urban development at the same time**

4

Dortmund - From industry to white collar city

Stadt Dortmund

1960 1970 1980 1990 1997

- within 2 decades 80,000 people in Dortmund lost their jobs due to decline of coal and steel industry
- today more than 80% of Dortmund´s employees work in the tertiary sector
- unemployment rate (August, 2018)
  Dortmund: 10.4%
  NRW: 6.8%
  Germany: 5.2%

5

Dortmunds Planning Instruments - „New Planning Culture“

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In 2000, Dortmund created the basis for a „new planning culture“.

Urban restructuring required
innovative planning instruments
which have been supplemented since then:

- strategic reorientiation: **dortmund-project**
- urban development: **Zoning Plan**
- district development: **InSEKts**
  development reports
- sectoral planning: **master plans**

handlungsprogramm Klimaschutz 2020 dortmund

nord wärts

6

Dortmund´s Strategy - dortmund-project (2001-2010)

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common strategy to create a „new Dortmund“

- **stabilize new economic sectors**
  - information technology
  - biotechnology/ life sciences
  - logistics
  - microsystems- and nanotechnology
  - production technology
- **reuse of former coal and steel sites** for new economic sectors
- **private-public-partnership**
  consortium of partners from academic and economic sector and administration

dortmund-project

7

Dortmund´s Development Instruments - Urban Zoning Plan (F-Plan) 2004

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Overall goal:
Enabling an economically, ecologically and socially resilient city

recultivation of fallow land
- to develop housing and economic sites with high urban development quality
- to increase green infrastructure ratio
- to connect existing green infrastructure

→ to strengthen urban structure
→ to use more effectively existing infrastructure
→ to protect open space

increase of green infrastructure
- F-Plan 1985: 13,225 ha (47.2%)
- F-Plan 2004: 14,051 ha (50.1%)

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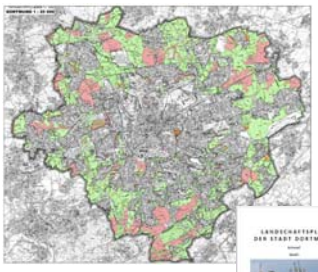
Dortmund´s Planning Instruments - Landscape Plan

Stadt Dortmund

„green plan“ for areas outside of settlements

- sectoral planning tool supplementing Zoning Plan
- includes development goals and mandatory targets



63% of Dortmund´s actual land use consists of green infrastructure

To protect and improve this share the enforceable Landscape Plan is currently in a revision process due to

- updates in land-use planning
- new ecologic development goals, e.g. biologic diversity goals in communities
- Dortmund´s goal to protect >10% of its area as nature reserves

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Dortmunds Planning Instruments - Master Plans and InSEKts

Stadt Dortmund

First plans were synchronized with zoning plan 2004:

- strategic and long-term orientation
- informal plans, but mandatory for administration
- participatory processes with experts, citizens, local politicians, and administration
- master plans with thematical focus, InSEKts and development reports with areal focus

Thematically, these plans partially overlap but do not contradict themselves

Currently, Dortmund has master plans and development plans for all important aspects of urban development

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Dortmund´s Development Goals - Sustainability Strategy

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Sustainability is a strategic goal in Dortmund for all aspects of development - always adapted to project requirements:

- **Economic developement**
- **Ecologic development**
- **Social developement**
- **Participatory processes**

Sustainability has a long tradition in Dortmund and is regarded internationally:

- EU Trade Award 2018: Education and community participation
- European Public Sector Award EPSA 2017: nordwärts
- Deutscher Nachhaltigkeitspreis 2014
- Eurocities Award 2009: Climate protection and energy efficiency

11

Success Stories - PHOENIX West and PHOENIX Lake

Stadt Dortmund

One of Germany‘s largest urban development projects of the past years (2001-2011):

Conversion of former steel production sites to attractive urban areas

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Success Stories - Revitalization of PHOENIX West

Stadt Dortmund

115 ha former blast furnace site:

reused for companies (micro/ nano-, production and information technology as well as services and leisure industry) and for urban green space

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Success Stories - Revitalization of PHOENIX Lake

Stadt Dortmund

100 ha former steel works site
reused for housing (~ 1,750 units), urban green space and a lake (24 ha), which also serves as a retention pond

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Success Stories - Selection of Converted Sites

Stadt Dortmund

Coal stock pile Ellinghausen:
IKEA Europe storage (100 ha)

Thier-Brewery:
Shopping Mall
Thier Galerie

Coal mine Minister Stein:
Office Space

Bild: Hans Blossey

British Redesdale Barracks:
German Federal Bank

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Success Stories and Future Ambitions - Revitalization of Westfalenhütte (since 2001)

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400 ha former steel work site reused for housing, economic development (150 ha, mainly logistics) and urban green space

~ 50 ha already reused (Amazon, IKEA, DHL,…),
~ 35 ha under construction, rest: planning process

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Current and Future Ambitions - Development of HSP-Site

Stadt Dortmund

- 45 ha area of former steel treatment works which closed end of 2015
- plans for housing (600-800 units), economic sites, and green infrastructure (park and lake) are currently substantiated
- area is part of proGIreg Living Lab and IGA Ruhr 2027

nordwärts

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Current Ambitions - Development of WILO Campus 2020

Stadt Dortmund

Picture: Wilo SE GLD Macina

- WILO founded in Dortmund in 1872, worldwide leading manufacturer of high-tech pumps and pump systems
- enlargement on premises and adjacent sites:
  construction of a new headquarter uniting ecological and economical sustainability as well as flexibility in production and efficient use of floorspace
- Installation of **smart factory** with a new production-and-logistics-concept reconfigurating all processes from supplier to customer

18

Future Ambitions - Zoned Sites for Economic Development: 250 ha

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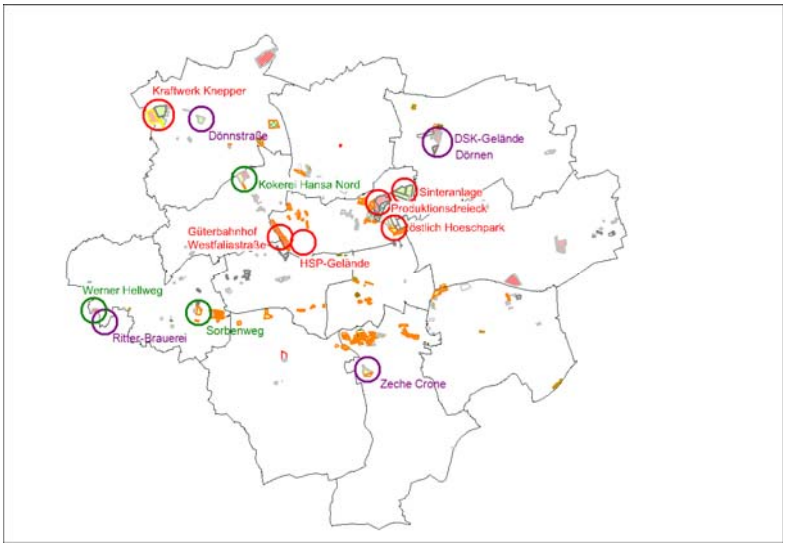

19

Future Ambitions - Zoned Sites for Residential Areas: 450 ha

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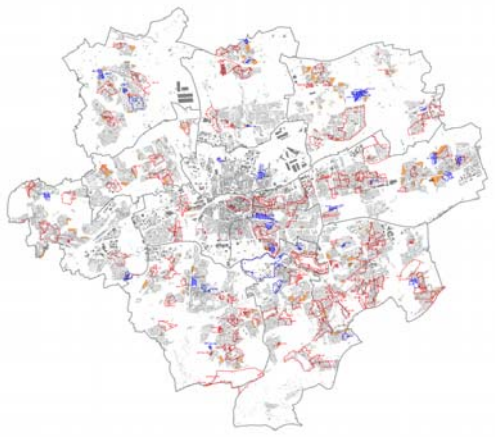

- analysis of annual monitoring of available residential areas (Wohnbauflächenmonitoring) as a strategic planning basis
- monitoring of quantitative and qualitative aspects
- almost half of the sites have the legal basis for short-term use

20

Current Ambitions - Housing Development on Urban Fallow Land

Stadt Dortmund

planning strategy: compact housing areas with high quality of living

Kronprinzenviertel

- 10 ha area of a former freight terminal
- plans for housing (~600-650 units, single and apartment houses)

Borsigplatzquartier

- 6 ha area of a former steel works plant
- plans for housing (~400-500 units, apartment houses)

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Success Stories - Housing Development on Urban Fallow Land

Stadt Dortmund

Predominantly apartment houses on fallow land

Former steel works
PHOENIX Lake
26 ha, 1,750 units

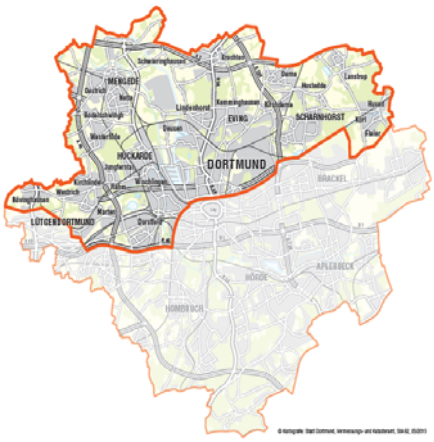
Former military site Stadtkrone Ost
20 ha, 600 units

Former freight terminal Stadtquartier Ost
7 ha, 460 units

22

Current and Future Ambitions - nordwärts going north

Stadt Dortmund



Project area:

45.7% of Dortmund´s area

42% of Dortmund´s 601,780 inhabitants

7 out of 12 sub-districts

53% green spaces

23

Current and Future Ambitions - nordwärts going north

Stadt Dortmund

Project goals:

- emphasize the strengths of Dortmund´s northern districts
- point out its hidden treasures
- create synergies

How to get there:

→ Intense dialogues and participation
→ create new projects and new ways to finance them

Close cooperation and networking between citizens, politicians, administration, economy, and science

24

Urban Green Infrastructure Plans - Action Plan Climate Protection

Stadt Dortmund

Goal:
Save 40% CO_2 in 2020 compared to 1990

via
- 100 defined projects
- DLZE: service center energy
- Strategies to increase renewable energies and improve energy efficiency

→ 100 energy plus houses in Dortmund
→ energy efficiency: Green IT
→ energy efficiency @ Union quarter
→ activation of migrants to modernize homes energetically (AMeG)
→ green roofs

Aktivierung von MigrantInnen zur energetischen Gebäudemodernisierung

25

Urban Green Infrastructure Plans - Masterplan Energy Transition

Stadt Dortmund

Dortmund´s contribution to Germany´s policy to exit nuclear energy production until 2022:
diverse economical production of alternative energy with consideration of ecological and social aspects

Decentralized energy production
→ wind parks
→ solar parks, photovoltaic
→ block heat and power plant

→ resource efficiency
→ climate protection and climate impact adaption
→ mobility
→ skilled personnel

26

Urban Green Infrastructure Plans - Masterplan Mobility 2030

Stadt Dortmund

Goal:
Start of mobility transition, reduction of emissions caused by traffic, mobility for everybody, sustainable freight traffic, improvement of pedestrian and bicycle infrastructure and public transportation

→ efficient public transportation system
→ electro mobility/ charging stations
→ zero emission freight traffic
→ bicycle infrastructure
(Radschnellweg Ruhr RS1, metropolradruhr)

27

„Silicon Dortmund“ - Close Academic and Economic Network

Stadt Dortmund

- **7academic institutions and 20research institutes, e.g.**
  - Technical University Dortmund
  - University of Applied Sciences Dortmund
  - ISM - International School of Management
  - FOM - University for Economics & Management
- **Technology Center Dortmund (TZDO) and Technology Park Dortmund**
  - adjacent to the Technical University
  - TZDO as an incubator for start-ups
  - one of Germany´s largest and most successful technology parks

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„Digital Dortmund“ - Digitalization Strategy for a Smart City

Stadt Dortmund

Digitalization as an enabler for a Smart City
connecting people and (digital) technologies via intelligent processes

As digital transformation increasingly influences daily life,
Dortmund follows a comprehensive strategic approach:

- 3 Master Plans: Digital Economy, Digital Education, Digital City Administration
- Smart City Alliance – cooperation of economy, research, administration, and citizens
- Digital Campus Dortmund Harbour: strong impulse for the surrounding district and going north/ nordwärts
- CIO - Chief Information/ Innovation Office
- Fraunhofer ISST & IML –
  Industrial Data Space and Smart City Data Space

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„Attractive Dortmund“ - Institutions of (inter)national Interest

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In the past years Dortmund was able to attract various educational and cultural institutions of (inter)national interest

- Baukunstarchiv NRW (Architecture Archive)
- Deutsches Fußballmuseum (German Soccer Museum)
- Konzerthaus Dortmund (Dortmund Concert Hall)
- Orchesterzentrum
  (Center for young orchestra professionals)
- Sparkassenakademie (Savings Bank Academy)

Bild: Deutsche Sparkassenakademie

Bild: Deutsches Fußballmuseum

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„Changing Dortmund“ -
A vibrant, dynamic and smart city!

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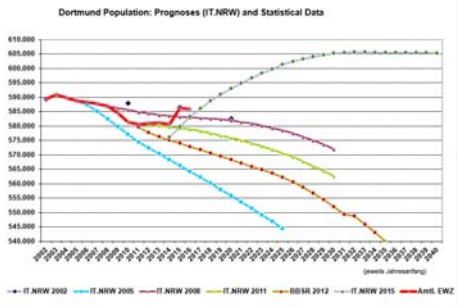

Source: Dortmund Statistik, 2018

Projections and visions:

- population growth for the next years
- focus on qualitative instead of on quantiative growth
- pursue, improve, and complete the develpment strategies of the past years
- open-minded for new changes

Structural change will go on –
because it will never end in a vibrant and dynamic city!

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Dortmund -
Modern and traditional at the same time

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Thank you for your attention!

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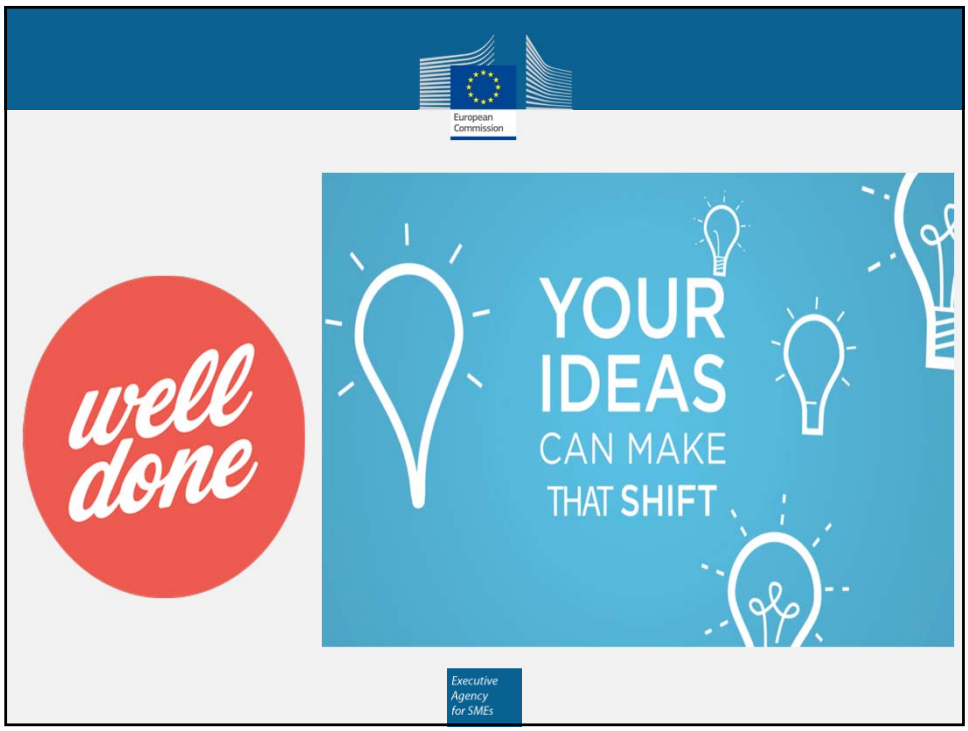
European Commission

Horizon 2020: Innovating Cities for sustainability and resilience

proGIreg Kick-off meeting
Dortmund, 25 September 2018

Ugo GUARNACCI, Phd
Project Adviser
European Commission
Executive Agency for SMEs (EASME)



European Commission

Structure

- Understanding the international policy setting around NBS
- The EU policy context
- EU R&I for Re-naturing cities
- A community of practice on NBS and cultural heritage

Research and Innovation

European Commission

Sendai Framework for Disaster Risk Reduction 2015-2030

SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR WORLD

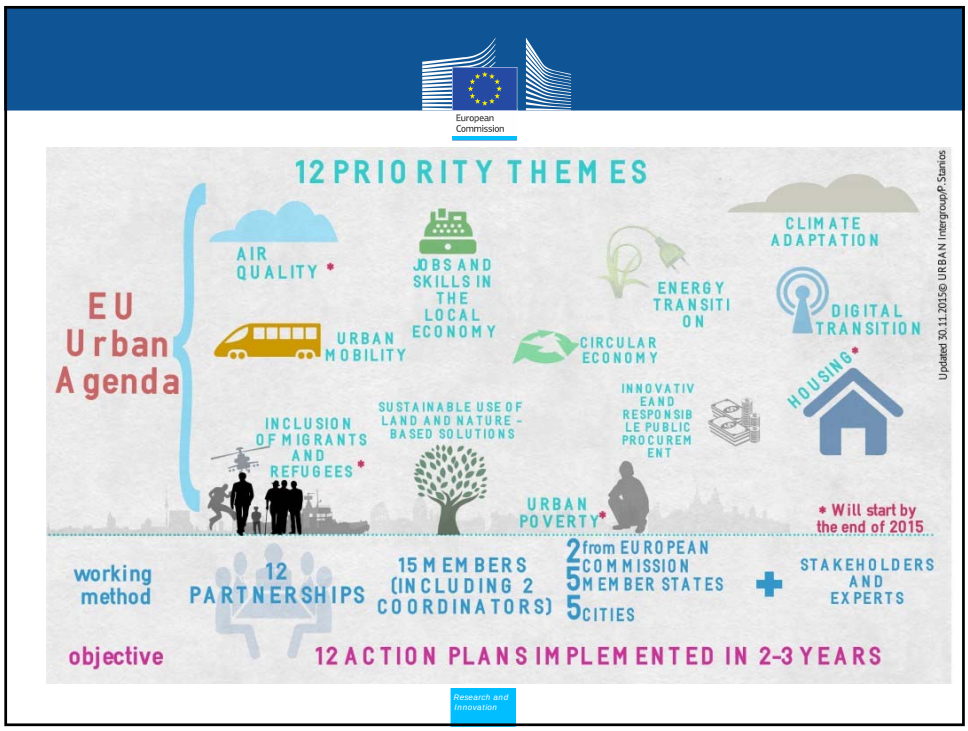
CBD

PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11

HABITAT III
QUITO - OCTOBER 2016

Research and Innovation

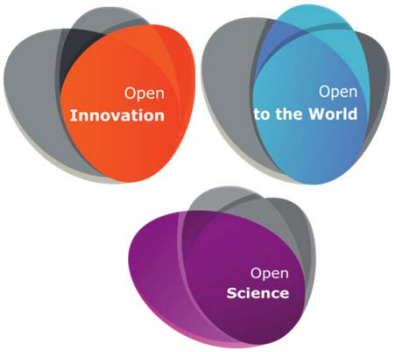

#NewUrbanAgenda
#InnovatingCities
"We will support science, research, and innovation, including a focus on social, technological, digital and nature-based innovation, robust science-policy interfaces in urban and territorial planning and policy formulation" […]
Quito Declaration on sustainable cities and human settlements for all - New Urban Agenda
United Nations Conference on Housing and Sustainable Urban Development - Habitat III - October 2016
Quito at night with Cotopaxi mountain © Santiago Cornejo


European Commission
12 PRIORITY THEMES
EU Urban Agenda
AIR QUALITY *
JOBS AND SKILLS IN THE LOCAL ECONOMY
CLIMATE ADAPTATION
ENERGY TRANSITION
DIGITAL TRANSITION
URBAN MOBILITY
CIRCULAR ECONOMY
HOUSING*
INNOVATIVE AND RESPONSIBLE PUBLIC PROCUREMENT
SUSTAINABLE USE OF LAND AND NATURE - BASED SOLUTIONS
INCLUSION OF MIGRANTS AND REFUGEES*
URBAN POVERTY*
* Will start by the end of 2015
working method
12 PARTNERSHIPS
15 MEMBERS (INCLUDING 2 COORDINATORS)
2 from EUROPEAN COMMISSION
5 MEMBER STATES
5 CITIES
STAKEHOLDERS AND EXPERTS
objective
12 ACTION PLANS IMPLEMENTED IN 2-3 YEARS
Updated 30.11.2015 © URBAN Intergroup/P. Stanics
Research and Innovation

EU R&I: an OPEN approach

Open Innovation

- cities as **'living labs'** and **actors of innovation**
- promotion of t**rans-disciplinary** and **multi-stakeholder** participatory approaches
- **co-creation** of solutions



Open Science

- open access, open platforms, open data, etc.

Openness to the World

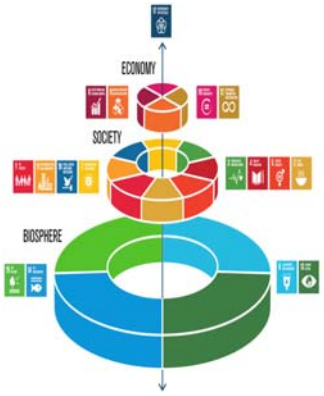
- strong international component

Research and Innovation

Cities as actors of Open Innovation

Multi-Stakeholder Partnerships

Nature-based solutions



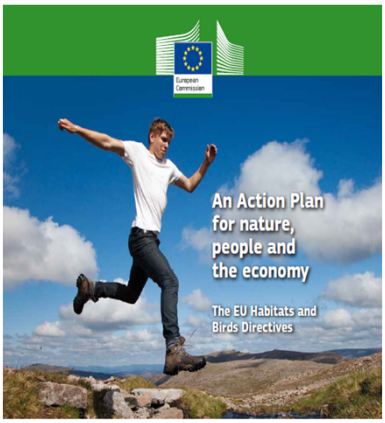
- ✓ Solutions **inspired and supported by nature** that simultaneously provide environmental, social and economic benefits and help to build resilience
- ✓ Solutions that **bring more nature and natural features and processes** into cities, landscapes and seascapes, through locally adapted and **systemic interventions**

→ **Living solutions → Engineered solutions → NO bio-mimicry; NO bio-materials**

EU Strategy on Adaptation to climate change (2013)

Priority 1: Promoting action by Member States	
Action 1.	Encourage MS to adopt Adaptation Strategies and action plans
Action 2.	LIFE funding, including adaptation priority areas
Action 3.	Promoting adaptation action by cities via the Covenant of Mayors initiative
Priority 2: Better informed decision-making	
Action 4.	Address knowledge gaps through research
Action 5.	Develop 'one-stop shop' platform for adaptation information in Europe: Climate-ADAPT
Priority 3: Adaptation in key vulnerable sectors	
Action 6.	Climate proofing the Common Agricultural Policy, Cohesion Policy, and the Common Fisheries Policy
Action 7.	**Making infrastructure more resilient**
Action 8.	Promote products & services by insurance and finance markets

EU Action Plan on Nature, People and the Economy

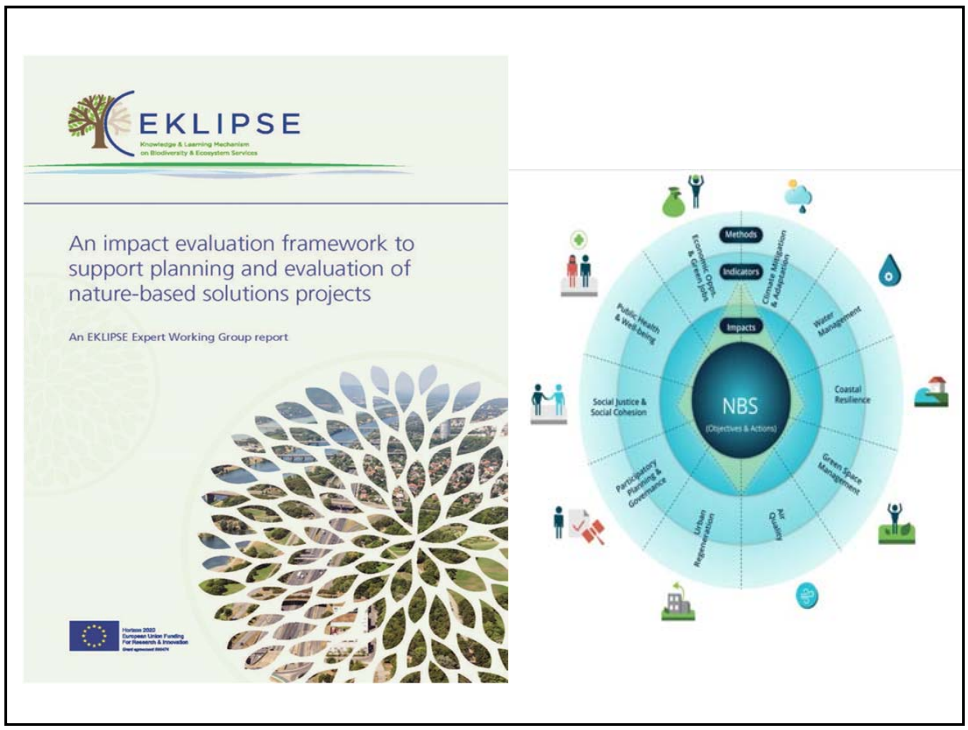


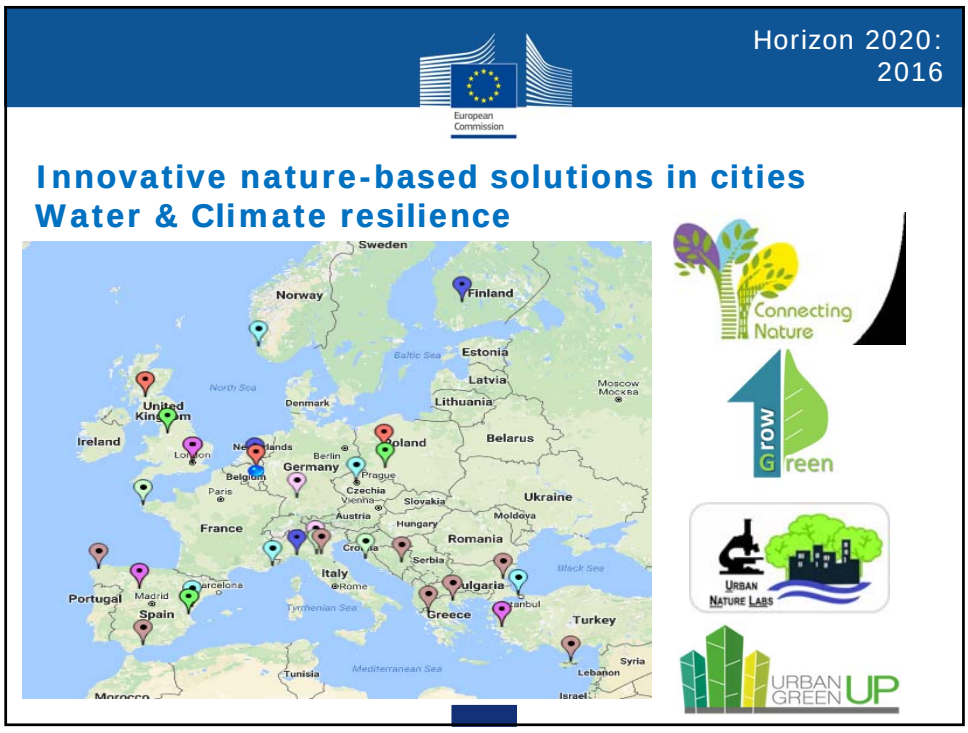
"[…] the successful economy and society of the future is a society that does not deplete our natural resources and that is in balance, in harmony, with its natural environment."

First Vice-President Timmermans's closing speech – 6 June 2017

Horizon 2020: Creating a community of practice on NBS

EKLIPSE NBS EWG	CSA	SC5-09-2014	European Knowledge and Learning Mechanism to Improve the Policy-Science-Society Interface on Biodiversity and ESS
INSPIRATION	CSA	SC5-10b-2014	Towards a strategic research agenda on soil, land-use and land management in Europe
ThinkNature	CSA	SC5-10-2015	Development of a multi-stakeholder dialogue platform and Think tank to promote innovation with Nature based solutions
NAIAD	RIA	SC5-9-2015	Insurance Value of Nature
Nature4Cities	RIA	SCC-03-2015	New governance, business, financing models and economic impact assessment tools for sustainable cities with NBS
Naturvation		SCC-03-2015	
CONNECTING	IA	SCC-02-2016	Demonstrating innovative NBS in cities/ water and climate resilience
GROW GREEN		SCC-02-2016	
UNALAB		SCC-02-2016	
Urban GreenUP		SCC-02-2016	
BiodivERsA3	ERA-NET	SC5-09-2014	Consolidating the European Research Area on biodiversity and ecosystem services


EKLIPSE
Knowledge & Learning Mechanism on Biodiversity & Ecosystem Services
An impact evaluation framework to support planning and evaluation of nature-based solutions projects
An EKLIPSE Expert Working Group report
Methods
Indicators
Impacts
NBS
(Objectives & Actions)
Economic Opps & Green Jobs
Climate Mitigation & Adaptation
Water Management
Coastal Resilience
Green Space Management
Air Quality
Urban Regeneration
Participatory Planning & Governance
Social Justice & Social Cohesion
Public Health & Well-being


Horizon 2020: 2016
European Commission
Innovative nature-based solutions in cities
Water & Climate resilience
Sweden
Norway
Finland
Estonia
Latvia
Lithuania
Moscow
Denmark
Ireland
Belarus
Germany
Prague
Czechia
Slovakia
Ukraine
Austria
Hungary
Moldova
France
Romania
Serbia
Italy
Rome
Bulgaria
Portugal
Madrid
Spain
Greece
Turkey
Syria
Lebanon
Tunisia
Mediterranean Sea
Connecting Nature
Grow Green
URBAN NATURE LABS
URBAN GREEN UP

European Commission

H2020 SCC-02-2017: your twin projects

CLEVER Cities	Hamburg (DE)	Belgrade (serbia)
	London (UK)	Larissa (GR)
	Milan (IT)	Madrid (ES)
		Malmö (SE)
		Sfantu Gheorghe (RO)
		Quito (Ecuador)
EdiCitNET	Rotterdam (NL)	Berlin (DE)
	Andernach (DE)	Sant de Feliu de Llobregat (ES)
	Oslo (NO)	Sempeter pri Gorici (SI)
	Heidelberg (DE)	Letchworth (UK)
		Montevideo (Uruguay)
		Carthage (Tunisia)
		Lomé (Togo)
proGIreg	Dortmund (DE)	Cluj Napoca (RO)
	Zagreb (HR)	Zenica (BA)
	Torino (IT)	Piraeus (GR)
	Ningbo (China; tbc)	Cascais (PT)
URBiNAT	Porto (PT)	Bruxelles (BE)
	Sofia (BG)	Høje-Taastrup (DK)
	Nantes (FR)	Nova Gorica (SI)
		Siena (IT)
		Shenyang (China)

Research and Innovation

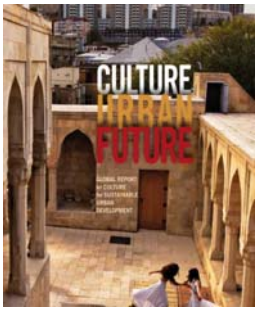
Cities present in H2020-SCC-02-2016-2017

European Commission

Horizon 2020: Linking Natural & Cultural Capital

2014 Italian Presidency of the Council of the European Union

Introducing the initiative "Charter of Rome on Natural and Cultural Capital"



UNESCO Report, 2016

2018 EUROPEAN YEAR OF CULTURAL HERITAGE #EuropeForCulture

Cultural landscapes

International R&I cooperation for Sustainable Cities

- Close collaboration with the **Belmont Forum**: **Sustainable Urbanisation Global Initiative – Food-Water-Energy Nexus (SUGI)**

Sustainable Urbanisation Global Initiative (SUGI)
FOOD-WATER-ENERGY NEXUS

BELMONT FORUM
URBAN EUROPE

- **EU-China & EU-CELAC Partnership on Sustainable Urbanisation**
- **EU-Brazil Sector Dialogue** on Sustainable Cities and Nature-Based Solutions

Areas for clustering projects financed under NBS in cities

I. NBS long-term sustainable data platform

- Initial stock taking and modus operandi
- Interoperability
  Participatory approach

II. Demonstrating the added-value of NBS

- Development of process KPIs and Key Impact Indicators
- Dissemination of best practices and knowledge transfer

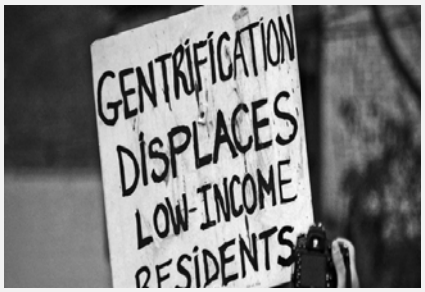
III. Mobilising additional investment

- Possible sources and mechanism for additional funding: private and public
- Dissemination of lessons learnt and success stories

Executive Agency for SMEs

Clustering of the 4 new H2020 NBS projects within the EWRC 2018

REGIONS & CITIES | European Week Brussels 8-11 October 2018



- Session on '**Who owns the right to the city? EU Research & Innovation for inclusive urban regeneration**' (Brussels – 9 October)
- First operational clustering meeting (11 October, Brussels).

Executive Agency for SMEs

Thank you for your attention!

Find out more:
www.ec.europa/research/horizon2020

Institute of Landscape Architecture | RWTH AACHEN UNIVERSITY

proGIreg

proGIreg project:
Making nature-based solutions work

Axel Timpe, RWTH Aachen University

Dortmund, 25/09/2018

www.progireg.eu

proGIreg

Ambitious goals:

„The objective of the call is to position Europe as world leader in innovating with nature to address urban societal challenges and thus support transition pathways towards sustainable urbanisation.

Nature-based solutions, such as well connected green and blue infrastructure and green and unsealed surfaces in cities, green roofs, natural water retention (…) are inspired and supported by nature and simultaneously provide environmental, social, cultural and economic benefits. (…)

They are designed to bring more nature and natural features and processes into cities, landscapes and seascapes, through locally adapted and systemic interventions. They are locally attuned, resource efficient, multi-purpose, multi-functional and multi-beneficial."

(Horizon 2020 Work Programme 2016 - 2017. Cross-cutting activities (Focus Areas), p. 111)

Ambitious goals:

„projects are expected to contribute to:
creating by 2020, through the implementation of nature-based solutions, healthier, culturally diverse and greener regenerated (including deprived districts and neglected or abandoned areas) European cities, with better living conditions for all, reduced crime and security costs, increased green infrastructure and biodiversity, improved air and water quality, enhanced human health and wellbeing, reduced health costs, improved mobility conditions, opportunities for urban farming and increased social cohesion, as well as to implementing the Sustainable Development Goals (SDGs), in particular SDG 1 'End poverty in all its forms everywhere' and SDG 10 'Reduce inequality within and among countries'."

(Horizon 2020 Work Programme 2016 - 2017. Cross-cutting activities (Focus Areas), p. 117)

Ambitious goals:

- "develop, deploy (…) and demonstrate in ‚front-runner' cities as ‚living laboratories' innovative, replicable and locally attuned nature-based solutions, with a systemic impact (…). Solutions should be co-designed, co-developed and co-implemented in a trans-disciplinary, multi-stakeholder and participatory context
- Assist ‚follower' cities that commit to proactively seek advice, expertise assistance, capacity building (…) and mentoring from the ‚front runners' and develop (…) a sustainable urban planning that systematically replicates, embeds and integrates the demonstrated nature-based solutions (…)
- (…) monitor (…) the performance and assess the impact of the deployed solutions in an as quantifiable way as possible against a well defined baseline (…). Assess the efficacy, performance and cost-effectiveness of the solutions compared to alternative options, considering benefits, co-benefits and negative impacts (…)"
- develop methodologies for replication and upscaling in different contexts (...)
- identify and assess potential regulatory, economic, social (…) and technical barriers
- Establish long-term sustainable data platforms to systematically document…"

(Horizon 2020 Work Programme 2016 - 2017. Cross-cutting activities (Focus Areas), p. 113-114)

A strong consortium to achieve these goals

proGIreg Dortmund 25/09/2018 5

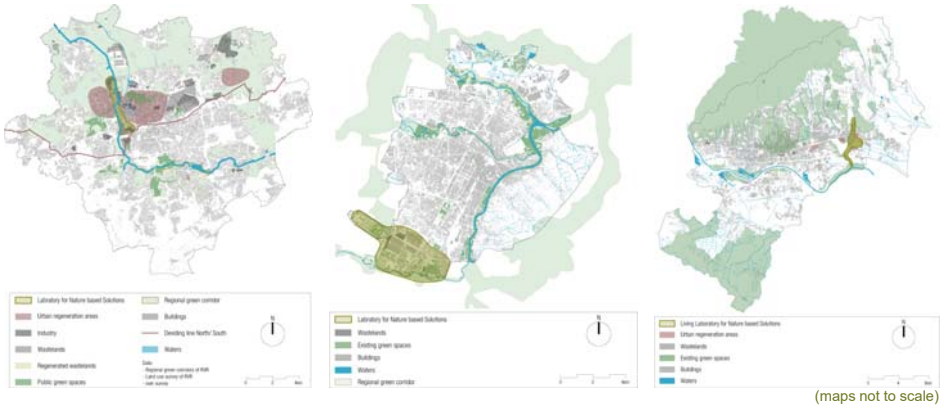
Participant No *	Participant organisation name	Country
1 (Coordinator)	Rheinisch-Westfaelische Technische Hochschule Aachen (RWTH), Uni	DE
2	Stadt Dortmund (DORTMUND), City	DE
3	Città di Torino (COTO), City	IT
4	Grad Zagreb (ZAGREB), City	HR
5	Cascais Ambiente – Terrestrial and maritime environment management (CASCAIS), City	PT
6	Dimos Peiraia (PIRAEUS), City	GR
7	Asociația de Dezvoltare Intercomunitară Zona Metropolitană Cluj (CLUJ), City	RO
8	City of Zenica (COZ), City	BA
9	ICLEI European Secretariat GmbH (ICLEI), NGO	DE
10	die Urbanisten e.V. (URBA), NGO	DE
11	Fondazione della comunità di Mirafiori (MIRAFIORI), NGO	IT
12	Kyttaro Enallaktikon Anazitiseon Neaon (KEAN), NGO	GR
13	hei-tro GmbH (HEITRO), SME	DE
14	EFB Europäische Föderation Bauwerksbegrünungsverbände (EFB), NPO	AT
15	Dual s.r.l. (DUAL), SME	IT
16	lohrberg stadtlandschaftsarchitektur (LOHRBERG), SME	DE
17	Starlab Barcelona (SL), SME	ES
18	Parco Scientifico E Technologico Per L'Ambiente - Environment Park SPA (ENVIPARK), large industry	IT
19	Urbasofia s.r.l. (URBASOFIA), SME	RO
20	Fundacion Privada Instituto De Salud global Barcelona (ISGlobal), Research org	ES
21	Università degli Studi Di Torino (UNITO), Uni	IT
22	Consiglio Nazionale Delle Ricerche (CNR), Research org	IT
23	Politecnico di Torino (POLITO), Uni	IT
24	Università Degli Studi Di Bari Aldo Moro (UNIBA), Uni	IT
25	Fachhochschule Suedwestfalen (SWUAS), Uni	DE
26	Zenica rezvojna agencija (ZEDA), Public org	BA
27	Sveuciliste U Zagrebu Arhitektonski Fakultet (AF ZAGREB), Uni	HR
28	City of Zagreb City Bureau for Physical Planning (ZZPUGZ), Public org	HR
29	Komfor Klima Grupa d.o.o. (KKG), SME	HR
30	Udruga Zelene I Plave Sesvete (ZIPS), NGO	HR
31	Orti Alti (OA), NGO	IT
32	Aquaponik Manufaktur GmbH (APM), SME	DE

proGIreg Dortmund 25/09/2018 6

Create productive GI in three front-runner cities

proGIreg

Dortmund **Turin** **Zagreb**



(maps not to scale)

proGIreg

Eight nature-based solutions to be tested:

NBS No. 1	Renaturing landfill sites for leisure use and energy production
NBS No. 2	New regenerated soil thanks to biotic compounds for urban forestry and urban farming
NBS No. 3	Community-based urban farming and gardening on post-industrial sites
NBS No. 4	Aquaponics as soil-less agriculture for polluted sites
NBS No. 5	Capillary GI on walls and roofs
NBS No. 6	Making post-industrial sites and renatured river corridors accessible for local residents
NBS No. 7	Establishing protocols and procedures for environmental compensation at local level
NBS No. 8	Pollinator biodiversity improvement activities and citizen science project

NBS address: circular economy and local resource use

NBS No. 1	Renaturing landfill sites for leisure use and energy production
NBS No. 2	New regenerated soil thanks to biotic compounds for urban forestry and urban farming
NBS No. 3	Community-based urban farming and gardening on post-industrial sites
NBS No. 4	Aquaponics as soil-less agriculture for polluted sites
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NBS No. 6	Making post-industrial sites and renatured river corridors accessible for local residents
NBS No. 7	Establishing protocols and procedures for environmental compensation at local level
NBS No. 8	Pollinator biodiversity improvement activities and citizen science project

NBS address: climate change adaption and mitigation

NBS No. 1	Renaturing landfill sites for leisure use and energy production
NBS No. 2	New regenerated soil thanks to biotic compounds for urban forestry and urban farming
NBS No. 3	Community-based urban farming and gardening on post-industrial sites
NBS No. 4	Aquaponics as soil-less agriculture for polluted sites
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NBS No. 6	Making post-industrial sites and renatured river corridors accessible for local residents
NBS No. 7	Establishing protocols and procedures for environmental compensation at local level
NBS No. 8	Pollinator biodiversity improvement activities and citizen science project

NBS address: urban biodiversity

NBS No. 1	Renaturing landfill sites for leisure use and energy production
NBS No. 2	New regenerated soil thanks to biotic compounds for urban forestry and urban farming
NBS No. 3	Community-based urban farming and gardening on post-industrial sites
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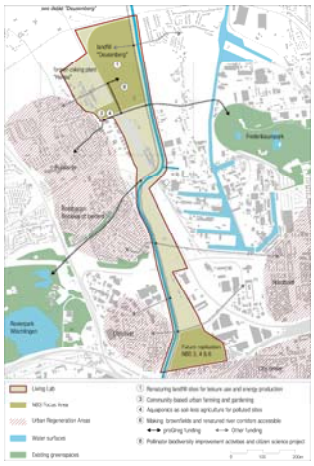
NBS No. 8	Pollinator biodiversity improvement activities and citizen science project

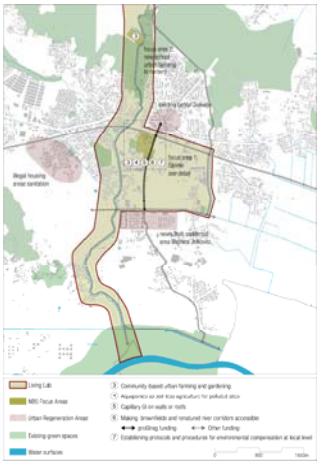
Focus NBS in the three urban Living Labs: Aquaponics in Dortmund

Dortmund



Turin

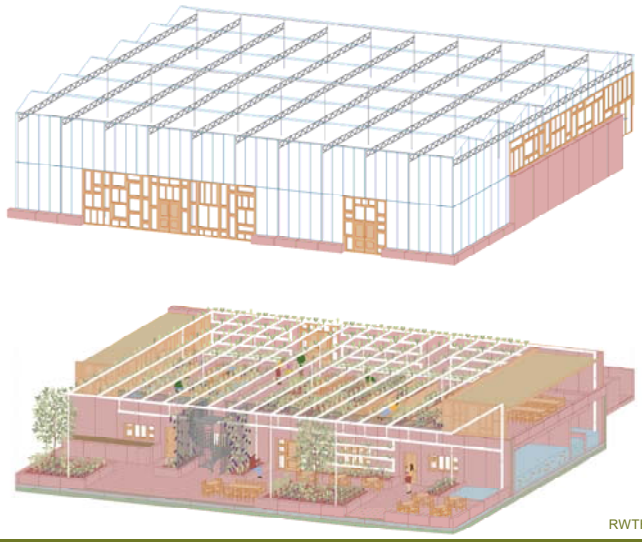
Zagreb



Five NBS to be implemented in Dortmund

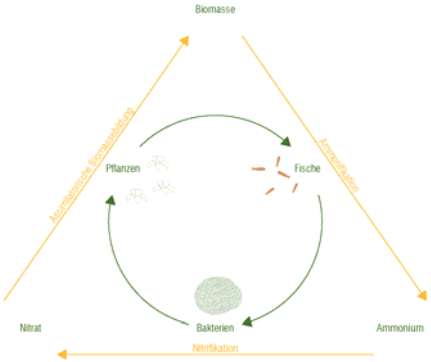
NBS No. 1	Renaturing landfill sites for leisure use and energy production
NBS No. 2	New regenerated soil thanks to biotic compounds for urban forestry and urban farming
NBS No. 3	Community-based urban farming and gardening on post-industrial sites
NBS No. 4	Aquaponics as soil-less agriculture for polluted sites
NBS No. 5	Capillary GI on walls and roofs
NBS No. 6	Making post-industrial sites and renatured river corridors accessible for local residents
NBS No. 7	Establishing protocols and procedures for environmental compensation at local level
NBS No. 8	Pollinator biodiversity improvement activities and citizen science project

Dortmund: creating a productive neighbourhood centre



RWTH Aachen, Luisa Ropelato

Dortmund:
creating a productive neighbourhood centre



Kreislaufführung der Nährstoffe in einer Aquaponikanlage

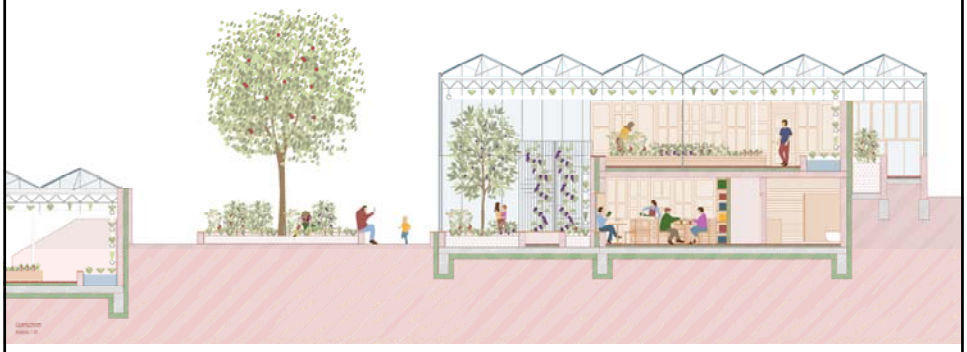
die urbanisten e.V.

RWTH Aachen, Luisa Ropelato

Dortmund:
creating a productive neighbourhood centre

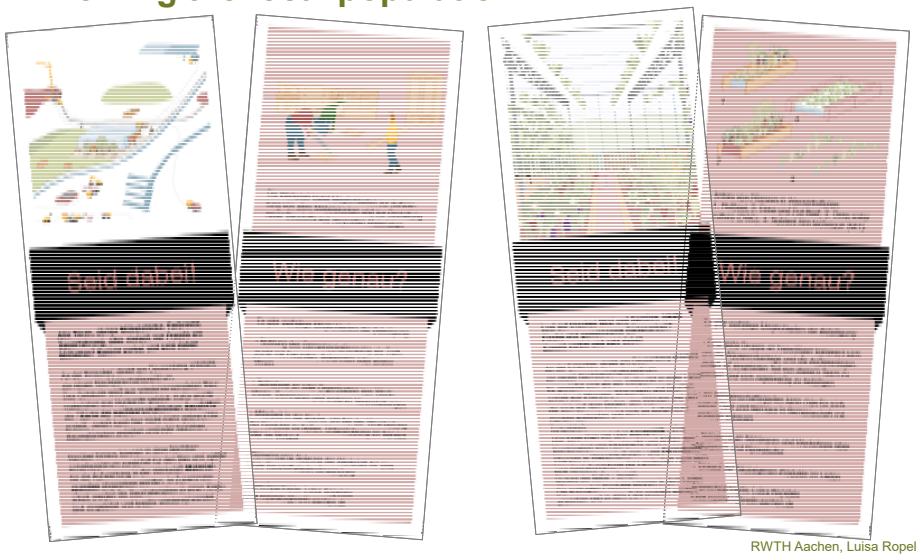
RWTH Aachen, Luisa Ropelato

Dortmund:
creating a productive neighbourhood centre



RWTH Aachen, Luisa Ropelato

Dortmund:
Involving the local population



RWTH Aachen, Luisa Ropelato

Dortmund: Living Lab partners

proGIreg

Municipality **NGO** **SME** **University**

Stadt Dortmund

die urbanisten

hei-trogmbh

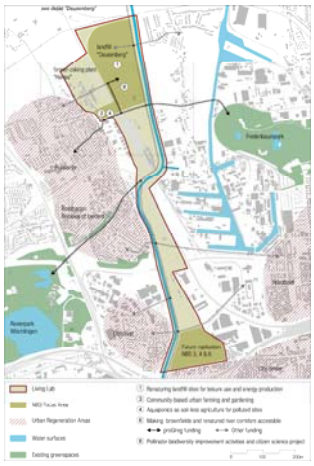
Fachhochschule Südwestfalen
University of Applied Sciences

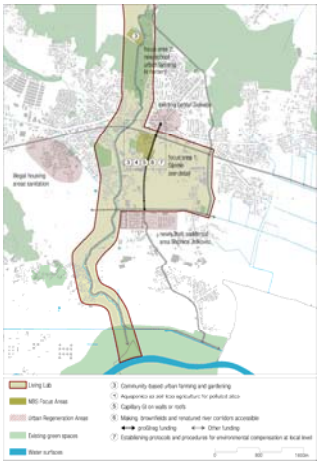
aquaponik manufaktur

Focus NBS in the three urban Living Labs: New Soil in Turin

proGIreg

Dortmund **Turin** **Zagreb**





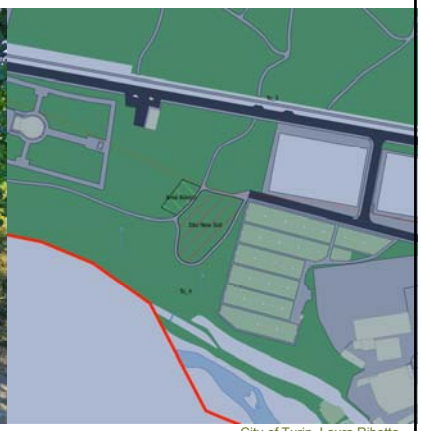
Seven NBS to be implemented in Turin

NBS No. 1	Renaturing landfill sites for leisure use and energy production
NBS No. 2	New regenerated soil thanks to biotic compounds for urban forestry and urban farming
NBS No. 3	Community-based urban farming and gardening on post-industrial sites
NBS No. 4	Aquaponics as soil-less agriculture for polluted sites
NBS No. 5	Capillary GI on walls and roofs
NBS No. 6	Making post-industrial sites and renatured river corridors accessible for local residents
NBS No. 7	Establishing protocols and procedures for environmental compensation at local level
NBS No. 8	Pollinator biodiversity improvement activities and citizen science project

Turin:
Regenerated soil from biotic compounds

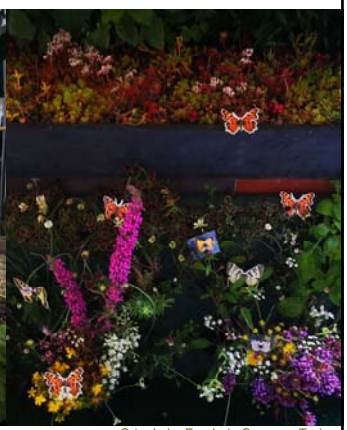
City of Turin, Laura Ribotta

Turin:
Regenerated soil from biotic compounds



City of Turin, Laura Ribotta

Turin:
Regenerated soil from biotic compounds



Ortoale Le Fonderie Ozanam, Torino

Turin:
Living Lab partners

proGIreg

Municipality

CITTA' DI TORINO

NGO

FONDAZIONE DELLA COMUNITÀ DI MIRAFIORI ONLUS

ORTI ALTI
FARM YOUR ROOFTOP. ENJOY SHARING!

SME / industry

ENVIRONMENT PARK Parco Scientifico Tecnologico per l'Ambiente

DUAL S.R.L.

University

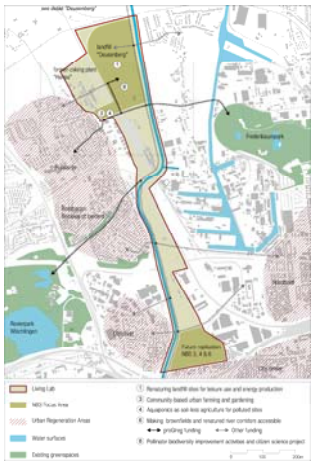
POLITECNICO DI TORINO

UNIVERSITÀ DEGLI STUDI DI TORINO

NBS in the three urban Living Labs:
Integrated reuse in Zagreb

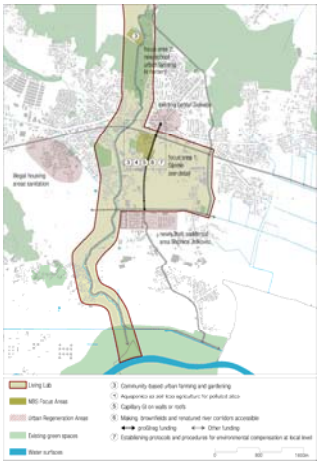
proGIreg

Dortmund



Turin

Zagreb



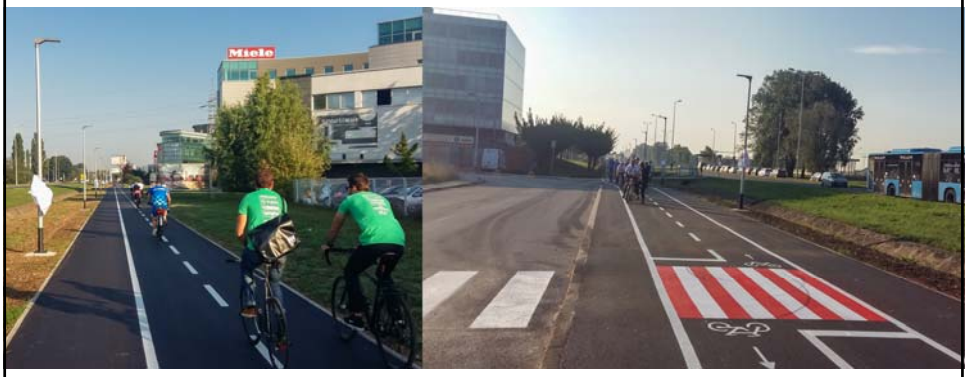
Six NBS to be implemented in Zagreb

NBS No. 1	Renaturing landfill sites for leisure use and energy production
NBS No. 2	New regenerated soil thanks to biotic compounds for urban forestry and urban farming
NBS No. 3	Community-based urban farming and gardening on post-industrial sites
NBS No. 4	Aquaponics as soil-less agriculture for polluted sites
NBS No. 5	Capillary GI on walls and roofs
NBS No. 6	Making post-industrial sites and renatured river corridors accessible for local residents
NBS No. 7	Establishing protocols and procedures for environmental compensation at local level
NBS No. 8	Pollinator biodiversity improvement activities and citizen science project

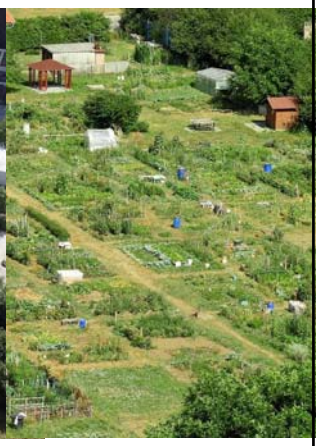
NBS in the three urban Living Labs: Silo buildings in Zagreb

NBS in the three urban Living Labs: Reuse and roof/facade greening in Zagreb

NBS in the three urban Living Labs: Creating a green connection in Zagreb



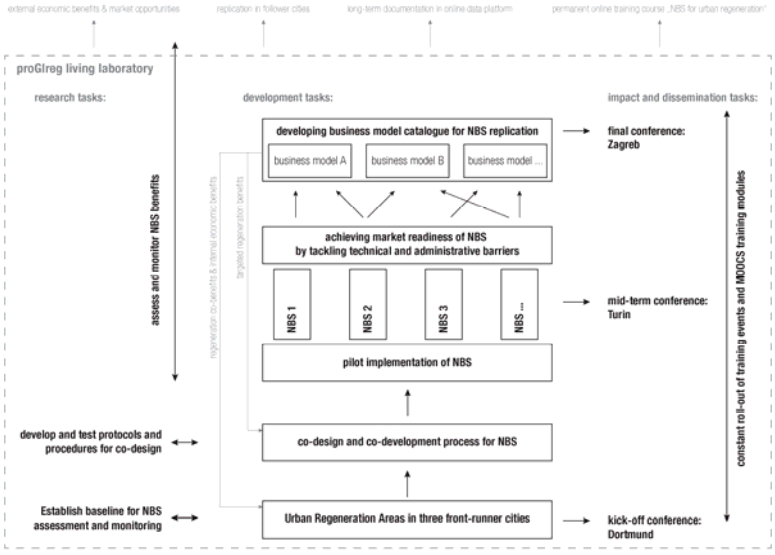
NBS in the three urban Living Labs: Enhancing Urban Gardening in Zagreb



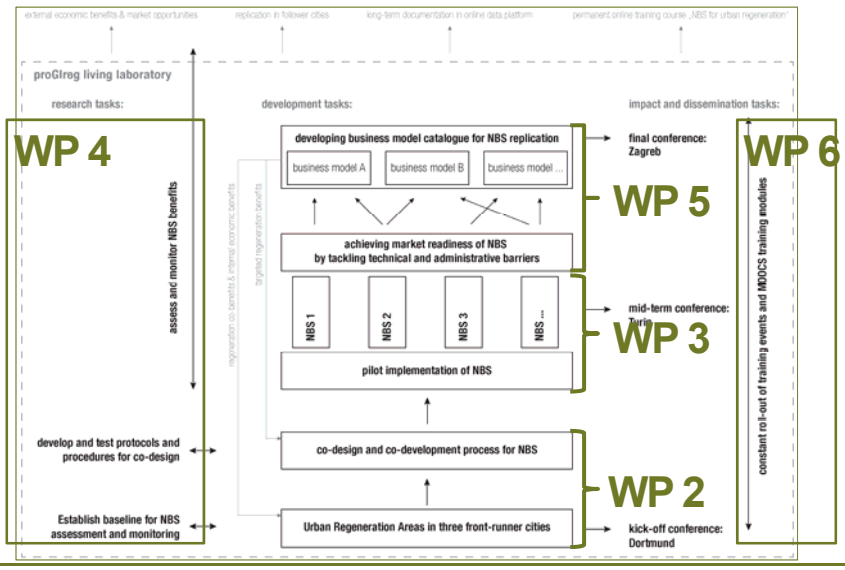
Zagreb: Living Lab partners

Municipality	NGO	SME / industry	University
CITY OF ZAGREB City Office for Strategic Planning and Development of the City	zelene i plave sesvete	komfor klima grupa	Af

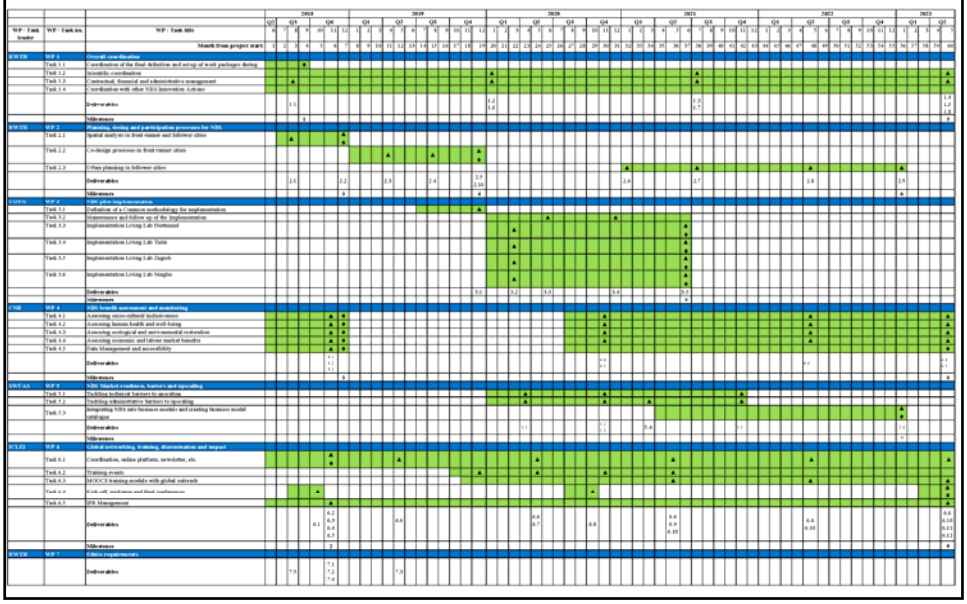
proGIreg research structure:



proGIreg research structure:



Work plan 2018-2023 :



Participating in proGIreg:

2019: Becoming an active local member in a Living Lab co-design in Dortmund, Turin or Zagreb

2020/21: Contribute to local NBS implementation in the Living Labs

2020/21: Hear about the environmental, economic and social benefits of proGIreg NBS

from 2020: Receive MOOCs training on NBS on EdX

2021/22: Plan for NBS in Cascais, Cluj-Napoca, Piraeus or Zenica

from 2022: create your business or organisation with a proGIreg NBS business model

Visit the proGIreg mid-term conference in Turin in autumn 2020.

Visit the proGIreg final conference in Zagreb in spring 2023.

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Living Labs: promises and challenges of a new research infrastructure

Stefan Böschen, HumTec RWTH Aachen University

proGIreg

Living Labs: What a mess !

Living Labs
Transition Labs
Social Innovation Labs
Sustainability Experiments
Sustainable Living Labs
Urban Transition Labs
Enterprise Labs
Real-World-Labs
…

Call for Living Labs

- Situations with (more or less) complex problems and the need for testing or creating new solutions
- Situations with multifaceted challenges for transformative action
- Situations with perceived limits of the established problem-solving routines and their proponents
- Situations with ill-defined division of labour between different social spheres

Real-world experimenting: Expectations

Legitimacy: inclusive implementation of experimental action is expected to increase legitimacy for the course of action

Efficacy: inclusive implementation of experimental action is expected to broaden the knowledge-basis for experimenting

Innovation: Inclusion of heterogeneous “epistemic agents” (Knorr Cetina 1999) might turn out a seedbed for unforeseen innovation

Real-world experimenting: Variants

Products, services: ICT, health, housing, learning, … (e.g. Hyysalo/Hakkarainen 2014; Liedtke et al. 2015)

Community development: development of strategies for climate-friendly action, district development, smart-cities activities … (e.g. Vicini et al. 2012; Evans/Karvonen 2014)

Transformative activities: Creating spaces as incubators for local/regional changes as blueprints for transformative action (e.g. Parodi et al. 2018)

Real-world experimenting

Experiments: protected spaces of actions with limited responsibilities

Expanding Experiments: technological innovations and their (un-)intended side effects

Real-world Experiments: intended streams of action to change world-conditions (natural and / or social)

Real-world experimenting: characteristics

Identifying key characteristics (see: Schäpke et al. 2018):

Contribution to transformation

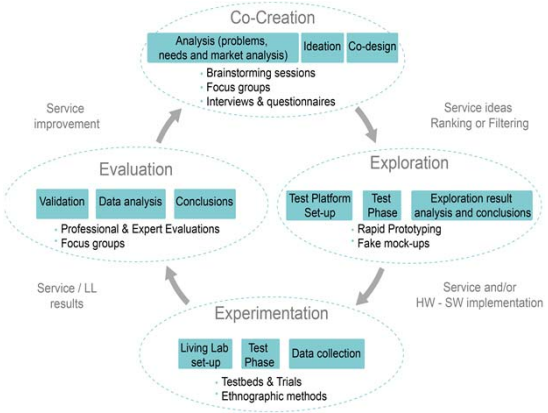
Experimental methods

Transdisciplinary research mode

Scalability and transferability of results

Reflexivity: Scientific and societal learning

Experimental Cycle



Source: Vicini et al. 2012, p. 203

Real-world experimenting: Factors

Some factors highly important:

Inclusion: Initiating and Maintaining a “continuum of participation” (Meyer-Soylu et al. 2016)

Knowledge Production: Transparency about the relevant knowledges, goals and values (e.g. Mitchell et al. 2015)

Generalizability: Blueprint / Up-Scaling

Awareness about structural boundary-conditions (e.g. Schneidewind et al. 2018)

Thank you for your attention !

Stefan.Boeschen@humtec.rwth-aachen.de

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Sustainable innovations: the role of local governments

Barbara Anton
Coordinator, Urban Water Management
Sustainable Resources, Climate & Resilience
ICLEI European Secretariat, Freiburg, Germany

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Dortmund

Image: Dreamstime / Bernd Brueggemann

Since June 2018:

Newly established ‚Chief Information/Innovation Office' (CIO)

Sustainable innovation: the role of local governments

proGIreg

Zagreb

In 2017:
Experimentation with social innovation stimulating collaboration between public servants, profit and non-profit actors from the creative industries, as well as stakeholders from academia

Sustainable innovation: the role of local governments

proGIreg

Torino

In 2016:
Recognised as the second innovative European city in the iCapital 2016 competition for its integrated activities and tools to encourage an open innovation culture.

Sustainable innovation: the role of local governments

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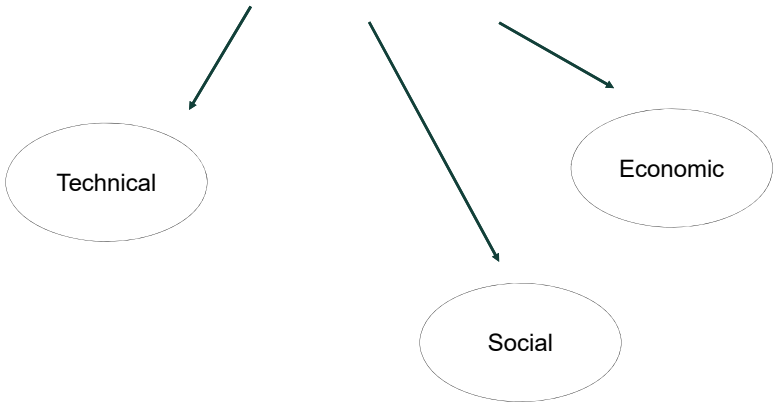
Dimensions of innovation



Sustainable innovation: the role of local governments

proGIreg

Innovation:

- to solve societal challenges in new and better ways

by

- leveraging the knowledge, skills, experience, creativity … of citizens and stakeholder institutions
- bringing new products and services to the market

Sustainable innovation: the role of local governments

proGIreg

Different motivations for sustainable! innovation

Private sector

> Competitive advantage
> Profit

Citizens/users

> Make sure that innovation matches their needs and interests

Public sector

Better quality of life for citizens, e.g. through:
> More efficiency in service provision
> Providing easier access to participation
> Taking care for a healthier natural environment

✓ In short: Innovation to reach agreed city development goals!

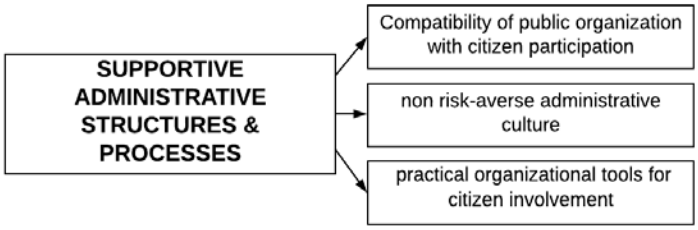
Sustainable innovation: the role of local governments

bw2 proGIreg

Local governments can stimulate innovation – how?

- ✓ Close to citizens/stakeholders→ LG can foster culture of participation
- ✓ Ownership of properties and buildings → LG can allocate space for people to meet and work together
- ✓ Power to set local rules → LG can provide safe framework for experimentation
- ✓ Manager of public budget → LG can make strategic investments, engage in pre-commercial procurement/innovation procurement/ innovation partnerships

Sustainable innovation: the role of local governments



Sustainable innovation: the role of local governments

proGIreg: sustainable innovation through Living Labs!

Stadt Dortmund
Stadtplanungs- und Bauordnungsamt

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From old industries to new gardens:

Emscher Green Corridor and International Garden Exhibition Metropole Ruhr 2027

Stefan Thabe
City of Dortmund, Urban Development

proGIreg

Deliverable	Name
Deliverable No.	123
Work Package	
Dissemination Level	PU/CO etc.
Author(s)	Name, surname partner organisation
Co-Author(s)	Name, surname partner organisation
Date	Day/Month/Year
File Name	DX.X_Title_Partner_Year-Month-Day
Status	
Revision	
Reviewed by (if applicable)	

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Stadtplanungs- und Bauordnungsamt

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Dortmund

- Situated in Central Europe
- Part of metropolitan area Ruhr and heart of Westphalia
- about 600.000 inhabitants
- Territory: 280 km² (28.000 ha)
- about 90 different districts

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Ruhr in former times

and present-day

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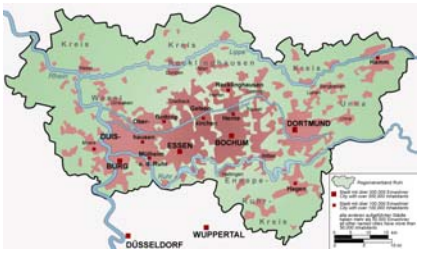
Das Ruhrgebiet: the Ruhr (area)

Das **Ruhrgebiet**
(**Revier**, **Ruhrpott, Kohlenpott**, **Pott, Metropole Ruhr**)

about 5,1 million inhabitants

area 4.435 km2,

Largest metropolitan area in Germany and 5th largest in Europe



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Emscher in former times

and the
Emscher landscape park now

Emscher

Emscher-system:
83,1 km from Holzwickede to Dinslaken/ Rhein with several little rivers flowing into the Emscher

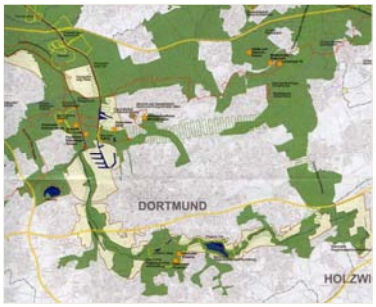
Canalization and straighten startet 1899: former natural river (system) changes to an open sewerage for waste water from households and the industry

Conversation in a natural river 1992 - 2020

Activities:
- New sewages to clean the waste water
- Building of a new subterranean sewerage-system
- Ecological reconstruction of the natural river

Investment by Emschergenossenschaft (cooperative): 4,5 Billion Euro – the largest infrastructure project in Germany/ Europe

„Emscher landscape-park (ELP)“



- Continuation the initiative of the International Building Exhibition (IBA: 1989 – 1999)
- Large regional scale project to create and develop new ecological areas and leisure-zones in an old industrial area, including housing and production areas
- ELP covers 32 % (9.063 ha) of all Dortmund’s territory
- Some projects have been already realized and some more are intended:
  - “Green circle” all around Dortmund
  - Environmental reconstruction of Emscher river
  - Phoenix-lake
  - Leisure time axis at Dortmund-Ems-Channel
  - … and much more!

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Dortmund yesterday

and today

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Dortmund

Structural change in Dortmund

coal-mining, steel-factories, breweries lost more than 80.000 jobs since 1980

Rate of unemployment around 11 %
Fallow industrial sites (brown fields)
Distressed urban areas

Around 25.000 new jobs within the last 10 years

Several new housing areas

Realizing large scale urban development projects

Growing population (> 600.000)

education and science: more than 50.000 students

PHOENIX West & PHOENIX See

Two fallow industrial sites (brown fields) with more than 200 ha

Location for housing and jobs, recreation, leisure and culture

Westfalenhütte

- around 450 ha
- largest development area in Dortmund
- High technology industrial site
- Steel production will remain
- New place for
  - Logistics
  - Housing
  - Green space
  - Retail (supermarket)

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Westfalenhütte

Rahmenplan Westfalenhütte

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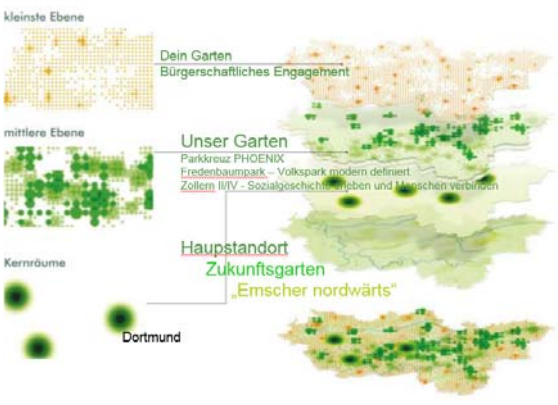
International Garden Exhibition Metropole Ruhr 2027



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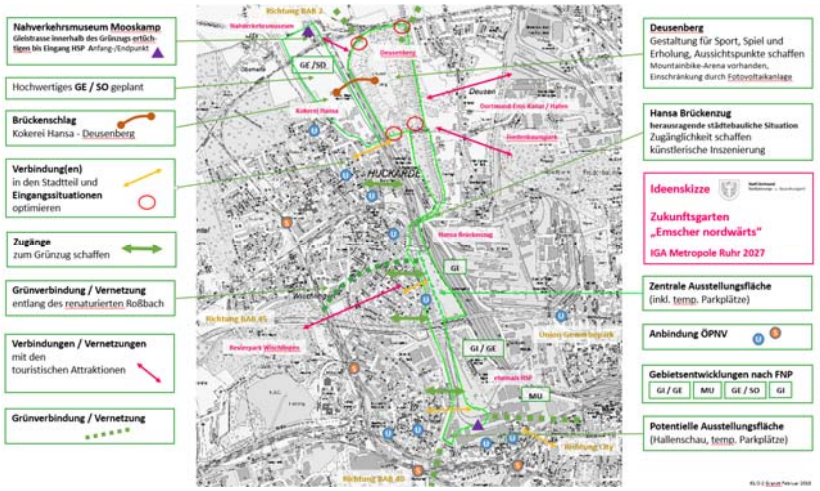

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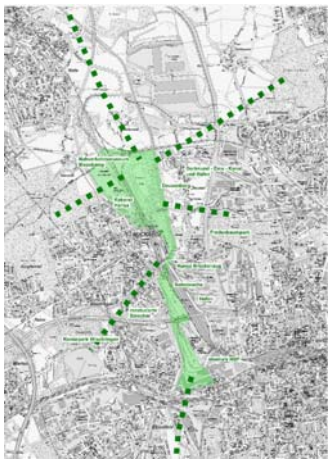

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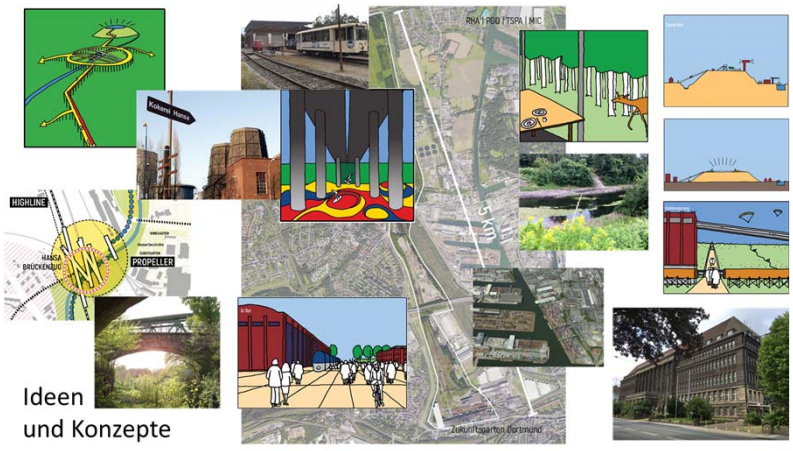

Ideen
und Konzepte

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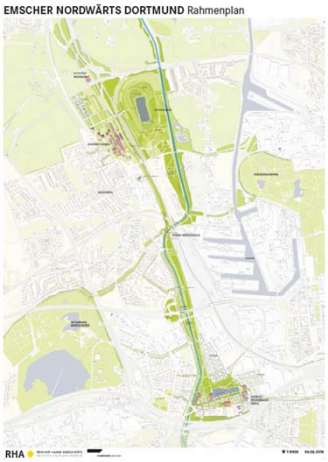
IGA Metropole Ruhr 2027

International Garden Exhibition Metropole Ruhr 2027

EMSCHER NORDWÄRTS DORTMUND Rahmenplan



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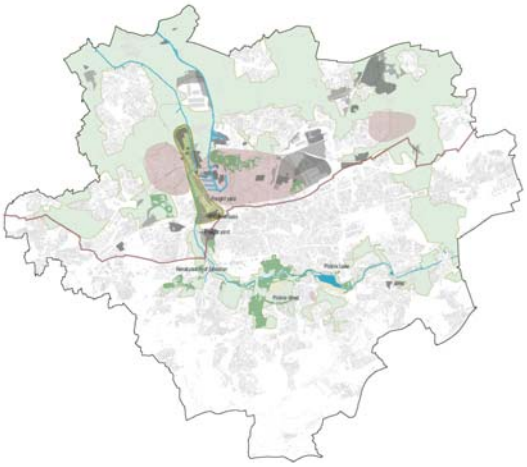
proGIreg Living Lab Dortmund



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Nature based solutions (NBS)

NBS No. 1: Renaturing landfill sites for leisure use and energy production

NBS No. 2: New regenerated soil tanks to biotic compounds for urban forestry and urban farming

NBS No. 3: Community-based urban farming and gardening on post-industrial sites

NBS No. 4: Aquaponic as a soil-less agriculture for polluted sites

NBS No. 5: Capillary Green Infrastructure on walls and roofs

NBS No. 6: Making post-industrial sites and renatured river corridors accessible for local residents

NBS No. 7: Establishing protocols and procedures for environmental compensation at local level

NBS No. 8: Pollinator biodiversity improvement activities and citizen science project

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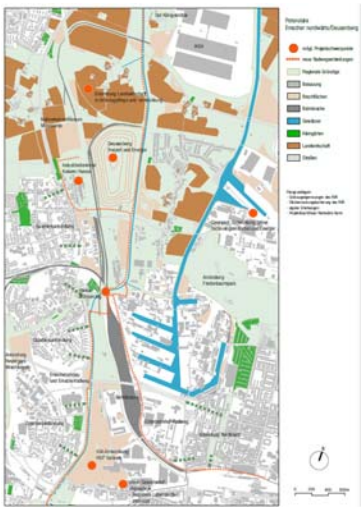
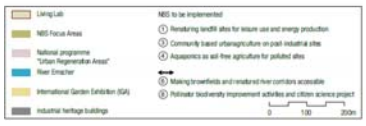
proGIreg Nature based solutions (NBS)





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Thank you!



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City of Dortmund, Urban Development

23

die urbanisten
lokal. kreativ. lebendig.

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Productive city: ideas for community-based aquaponics and urban gardening

Kickoff proGIreg, 25.9.2018

proGIreg

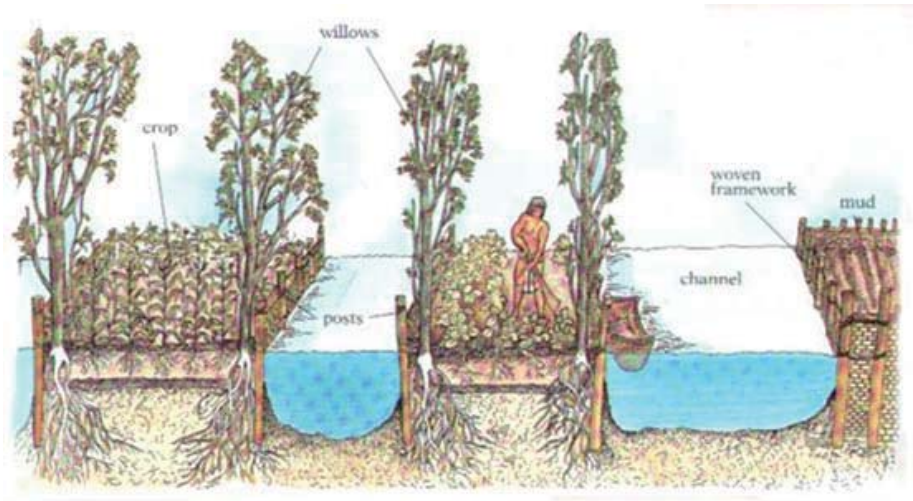
Nils Rehkop

Jonas Runte

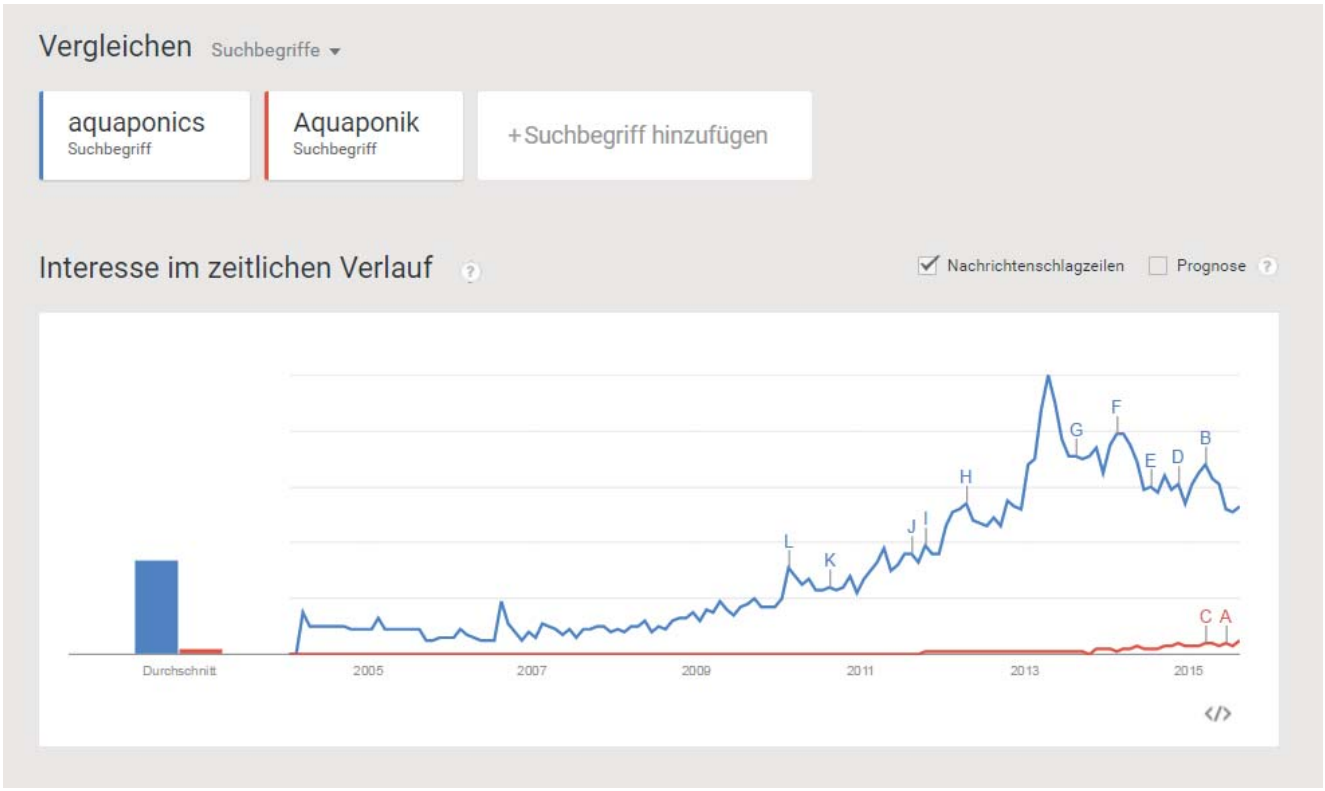
Jan Bunse

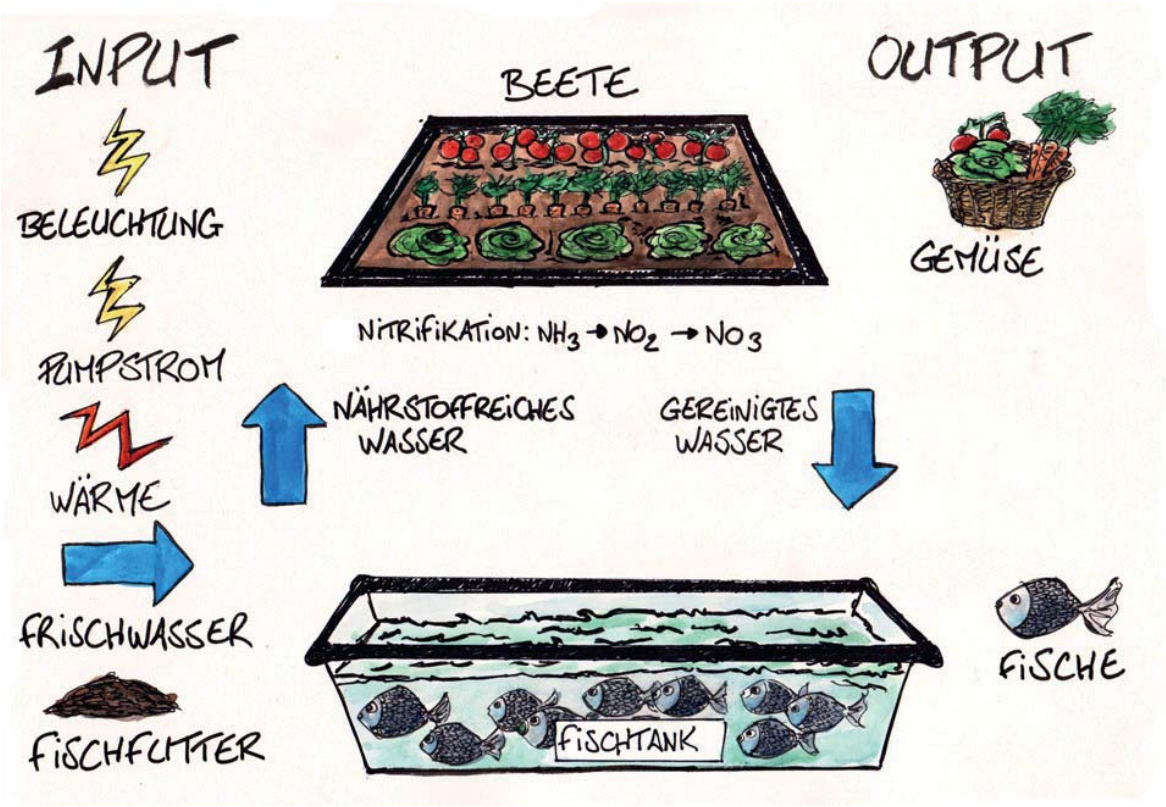
Fachhochschule Südwestfalen
University of Applied Sciences

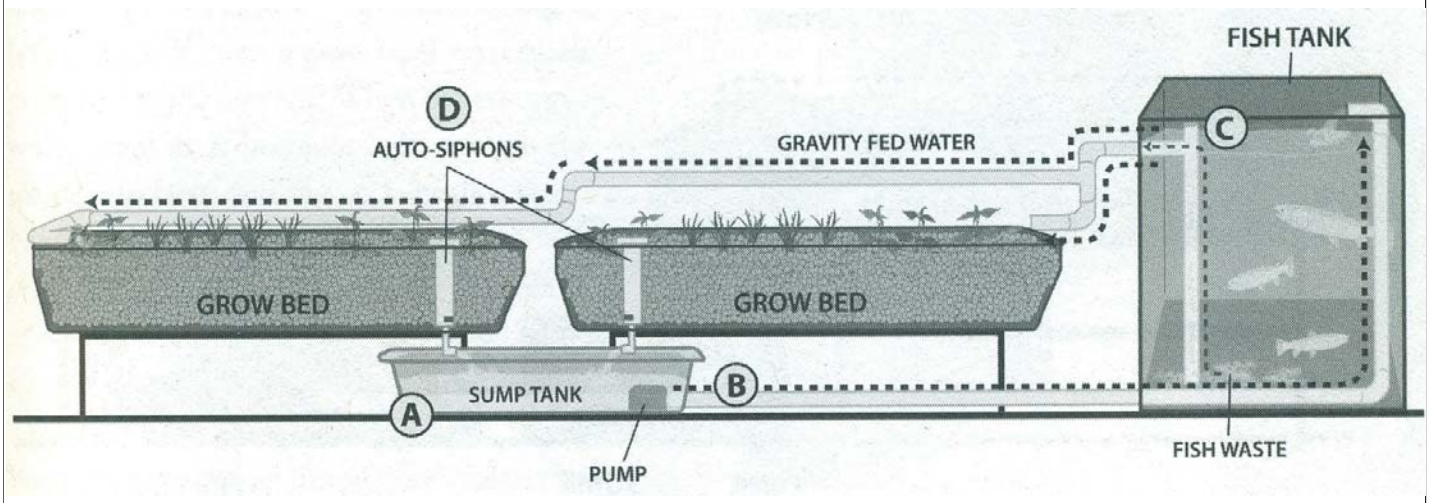
Rolf Morgenstern

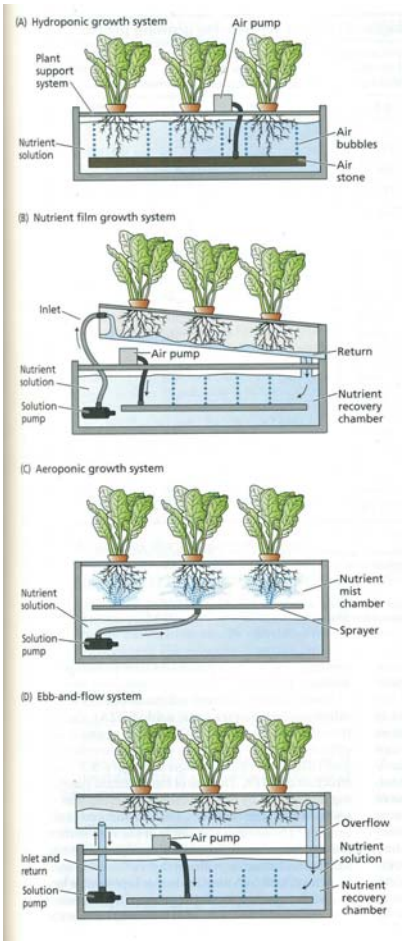


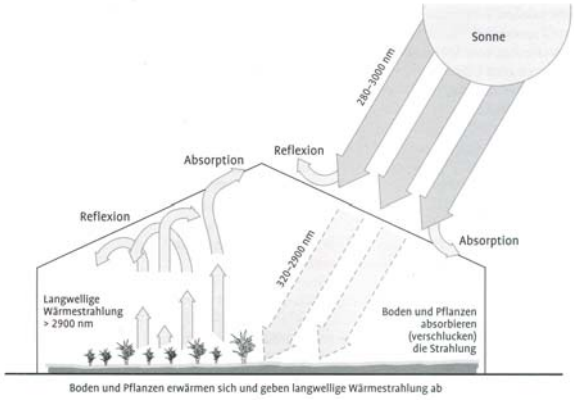
Cross-section of the *chinampas* (Midwest Permaculture).

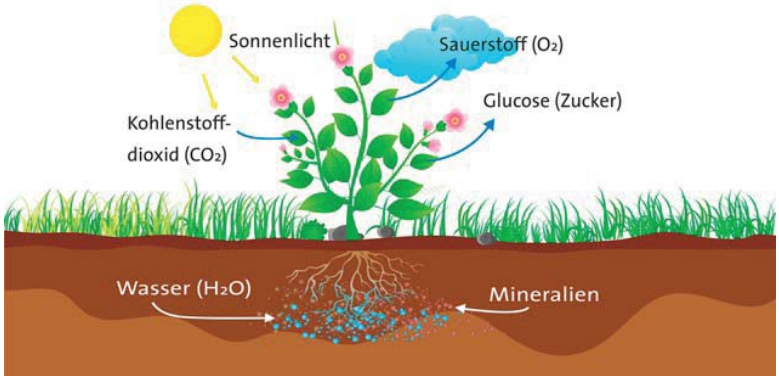

Vergleichen
Suchbegriffe
aquaponics
Suchbegriff
Aquaponik
Suchbegriff
+Suchbegriff hinzufügen
Interesse im zeitlichen Verlauf
Nachrichtenschlagzeilen
Prognose
Durchschnitt
2005
2007
2009
2011
2013
2015


INPUT
BELEUCHTUNG
PUMPSTROM
WÄRME
FRISCHWASSER
FISCHFUTTER
BEETE
NITRIFIKATION: NH3 → NO2 → NO3
NÄHRSTOFFREICHES WASSER
GEREINIGTES WASSER
FISCHTANK
OUTPUT
GEMÜSE
FISCHE


FISH TANK
D
AUTO-SIPHONS
GRAVITY FED WATER
C
GROW BED
GROW BED
SUMP TANK
B
A
PUMP
FISH WASTE







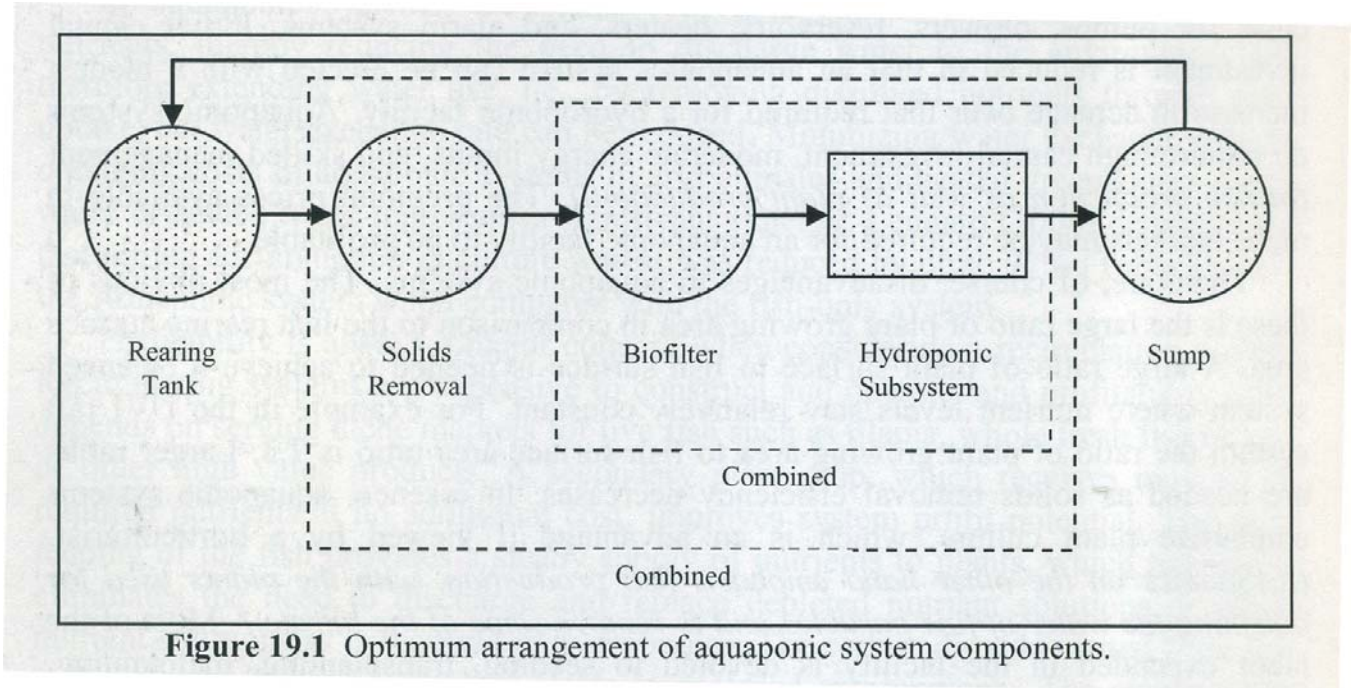
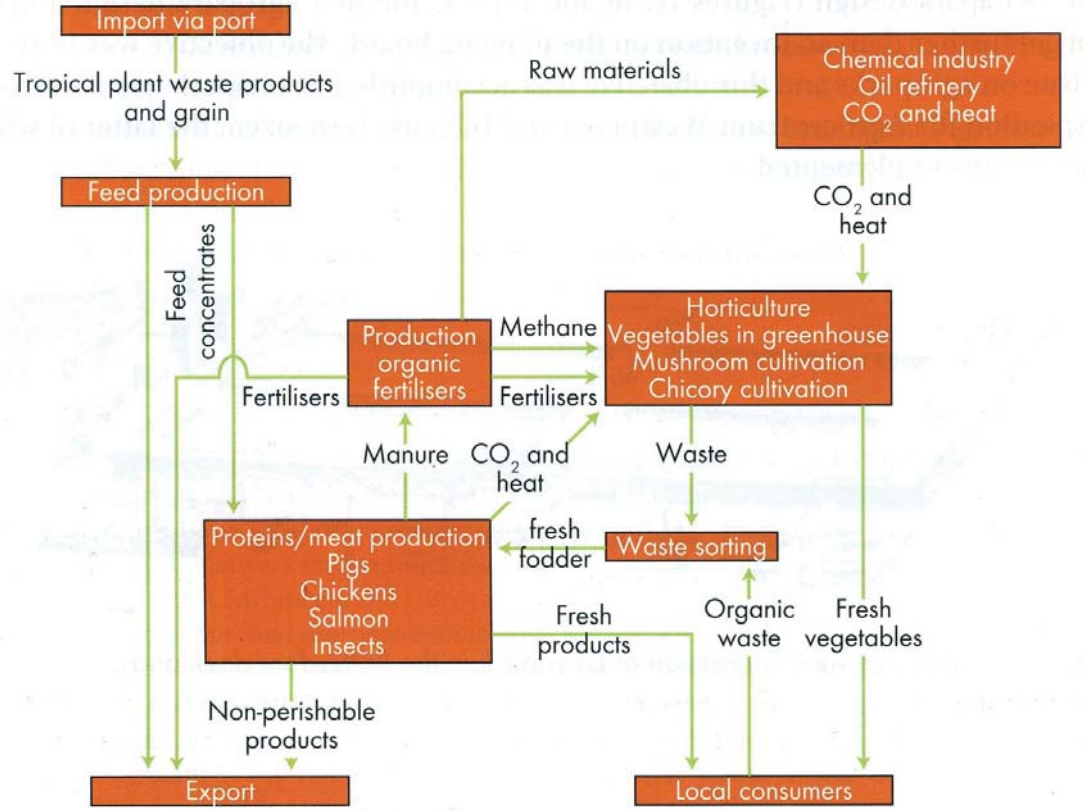
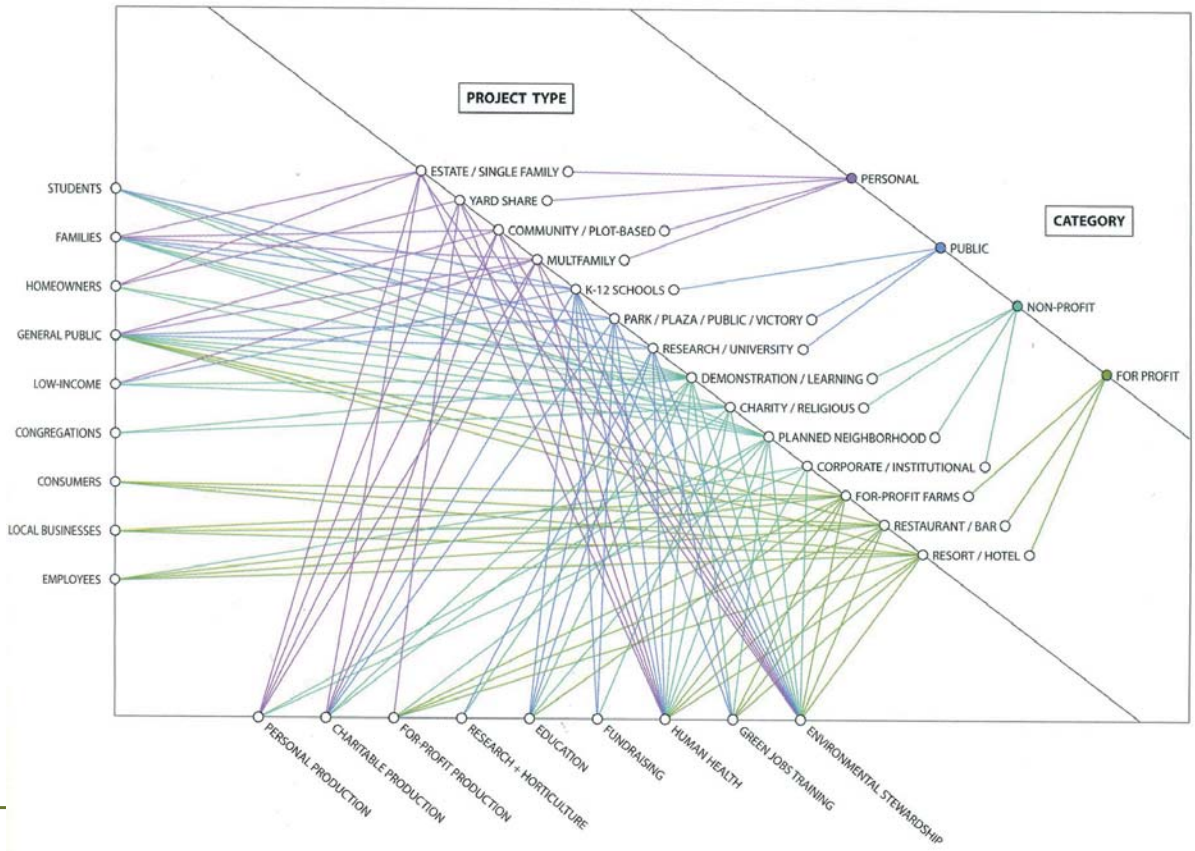
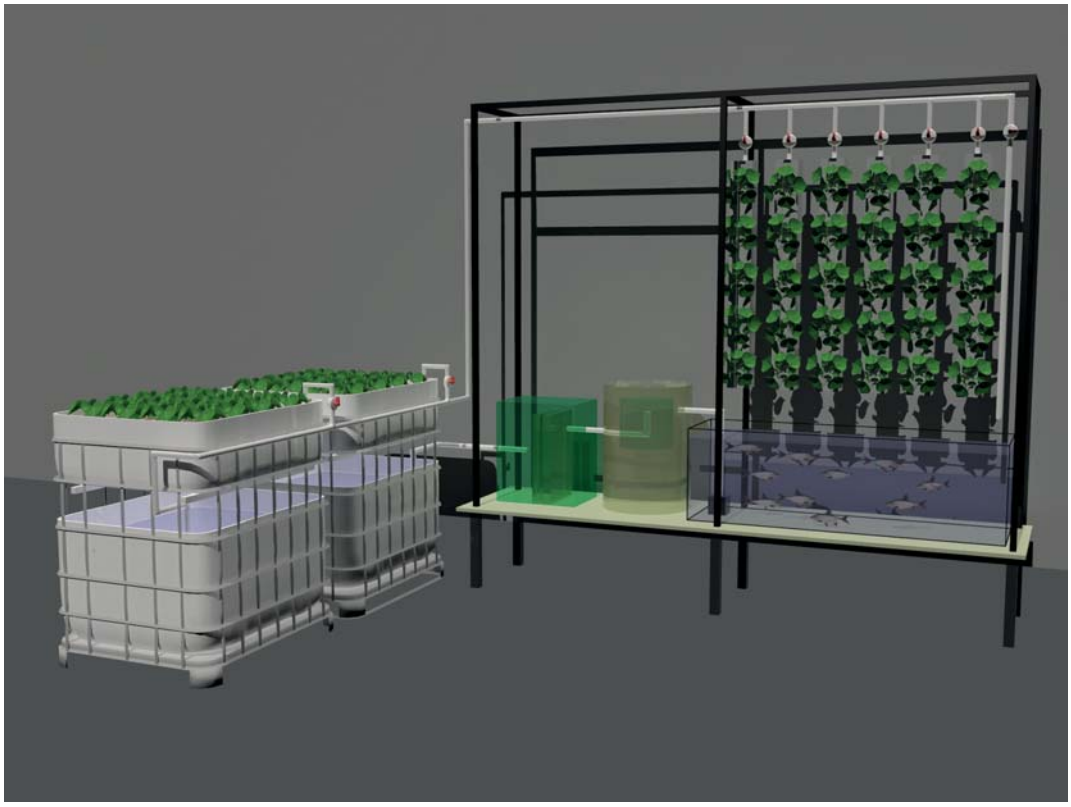
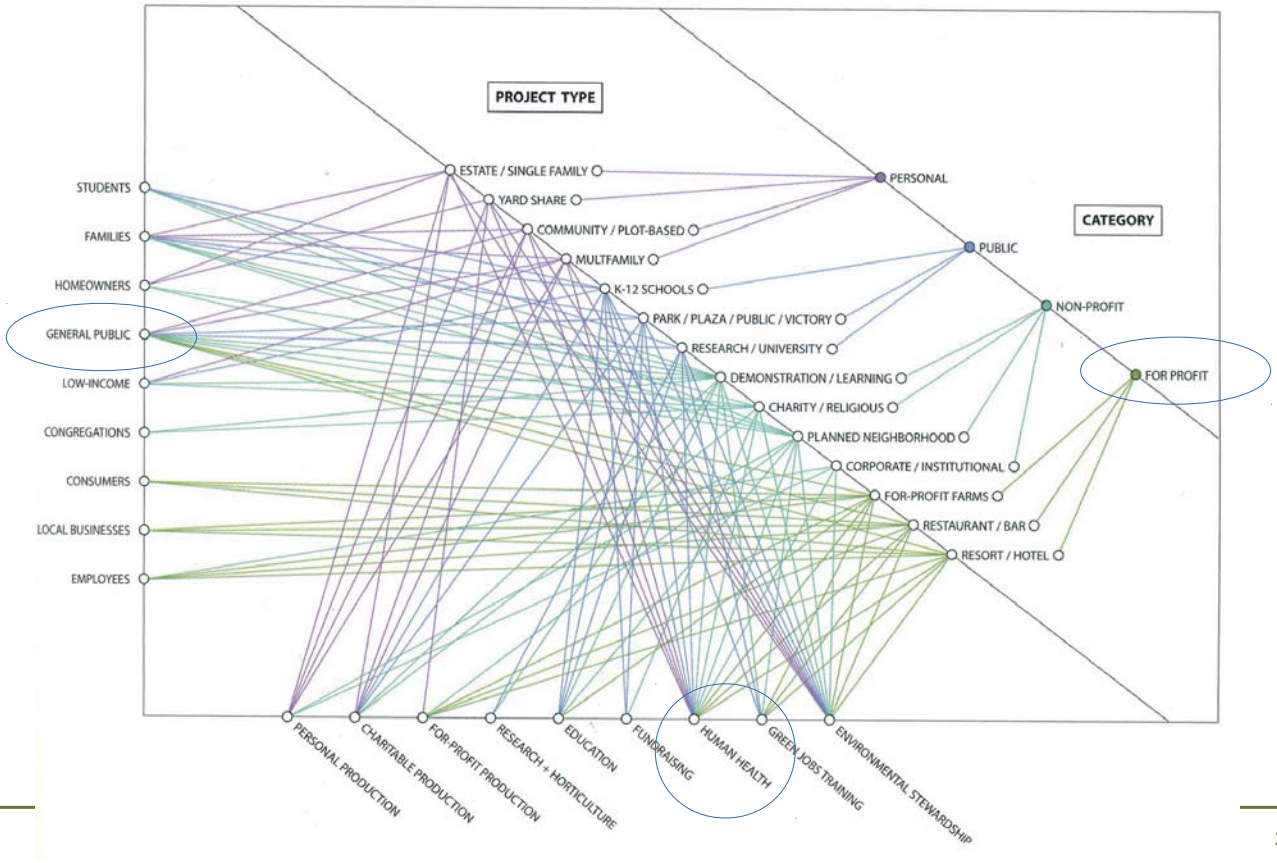


Figure 19.1 Optimum arrangement of aquaponic system components.


Import via port
Tropical plant waste products and grain
Feed production
Feed concentrates
Raw materials
Chemical industry
Oil refinery
CO_2 and heat
CO_2 and heat
Horticulture
Vegetables in greenhouse
Mushroom cultivation
Chicory cultivation
Production organic fertilisers
Methane
Fertilisers
Fertilisers
Manure
CO_2 and heat
Waste
Proteins/meat production
Pigs
Chickens
Salmon
Insects
fresh fodder
Waste sorting
Fresh products
Organic waste
Fresh vegetables
Non-perishable products
Export
Local consumers


PROJECT TYPE
CATEGORY
STUDENTS
FAMILIES
HOMEOWNERS
GENERAL PUBLIC
LOW-INCOME
CONGREGATIONS
CONSUMERS
LOCAL BUSINESSES
EMPLOYEES
ESTATE / SINGLE FAMILY
YARD SHARE
COMMUNITY / PLOT-BASED
MULTFAMILY
K-12 SCHOOLS
PARK / PLAZA / PUBLIC / VICTORY
RESEARCH / UNIVERSITY
DEMONSTRATION / LEARNING
CHARITY / RELIGIOUS
PLANNED NEIGHBORHOOD
CORPORATE / INSTITUTIONAL
FOR-PROFIT FARMS
RESTAURANT / BAR
RESORT / HOTEL
PERSONAL
PUBLIC
NON-PROFIT
FOR PROFIT
PERSONAL PRODUCTION
CHARITABLE PRODUCTION
FOR-PROFIT PRODUCTION
RESEARCH + HORTICULTURE
EDUCATION
FUNDRAISING
HUMAN HEALTH
GREEN JOBS TRAINING
ENVIRONMENTAL STEWARDSHIP




PROJECT TYPE
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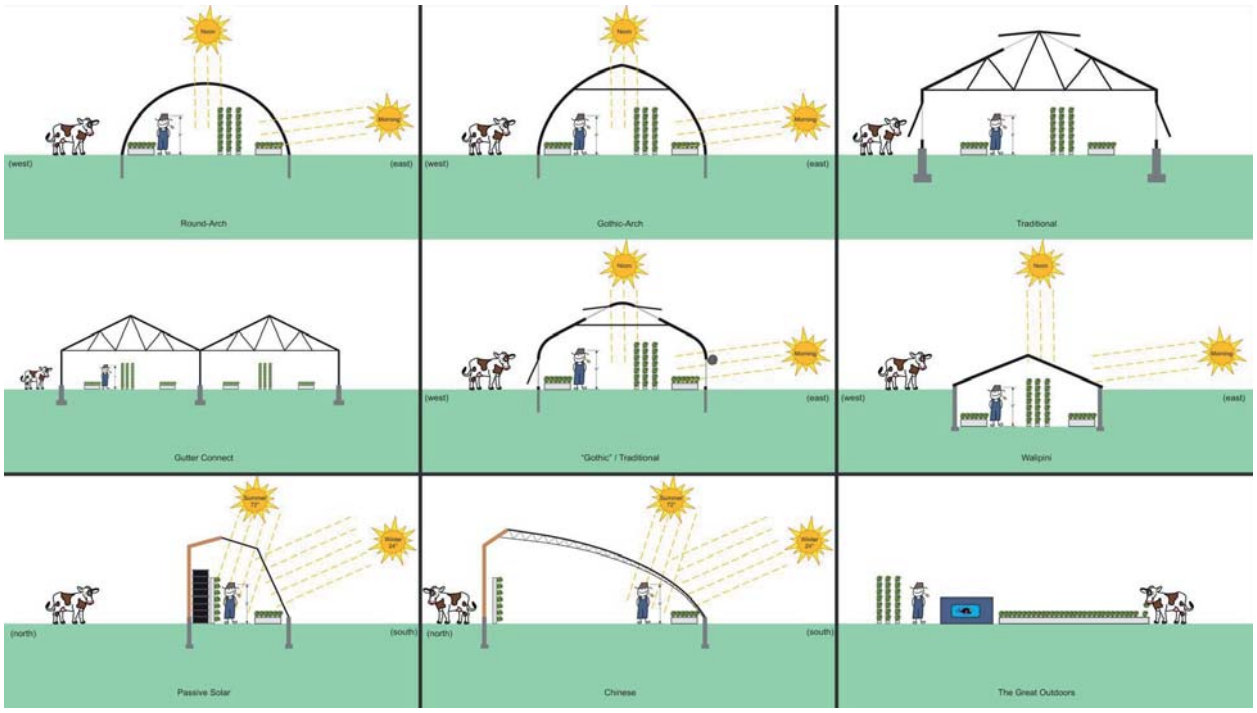
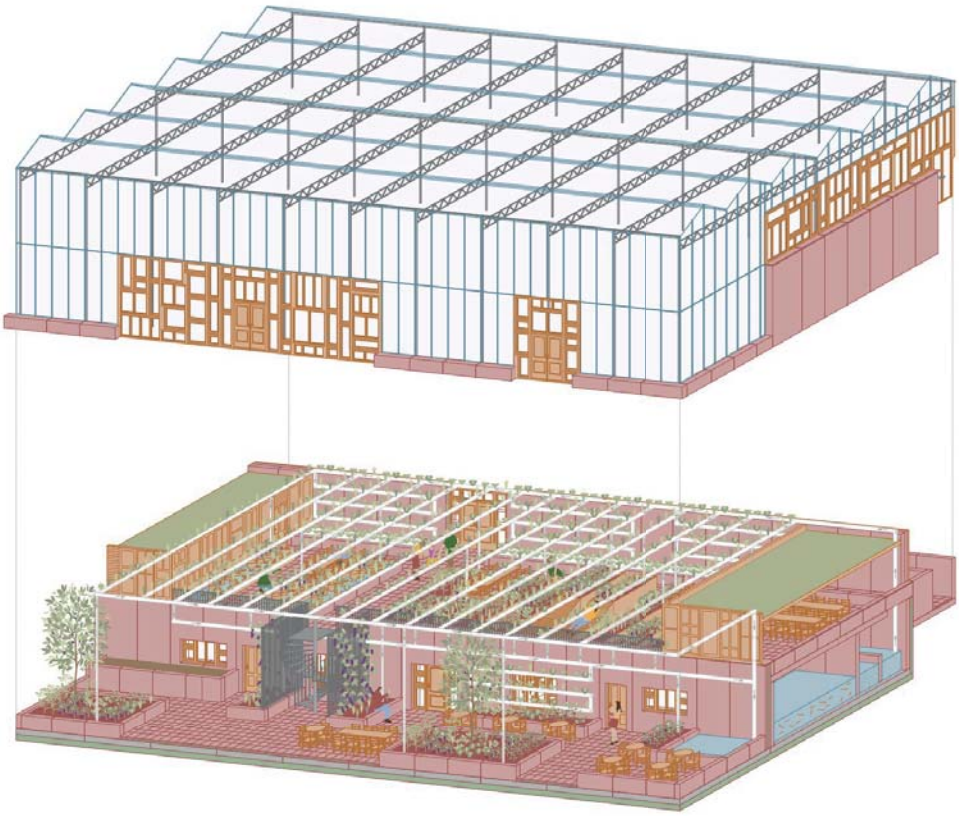
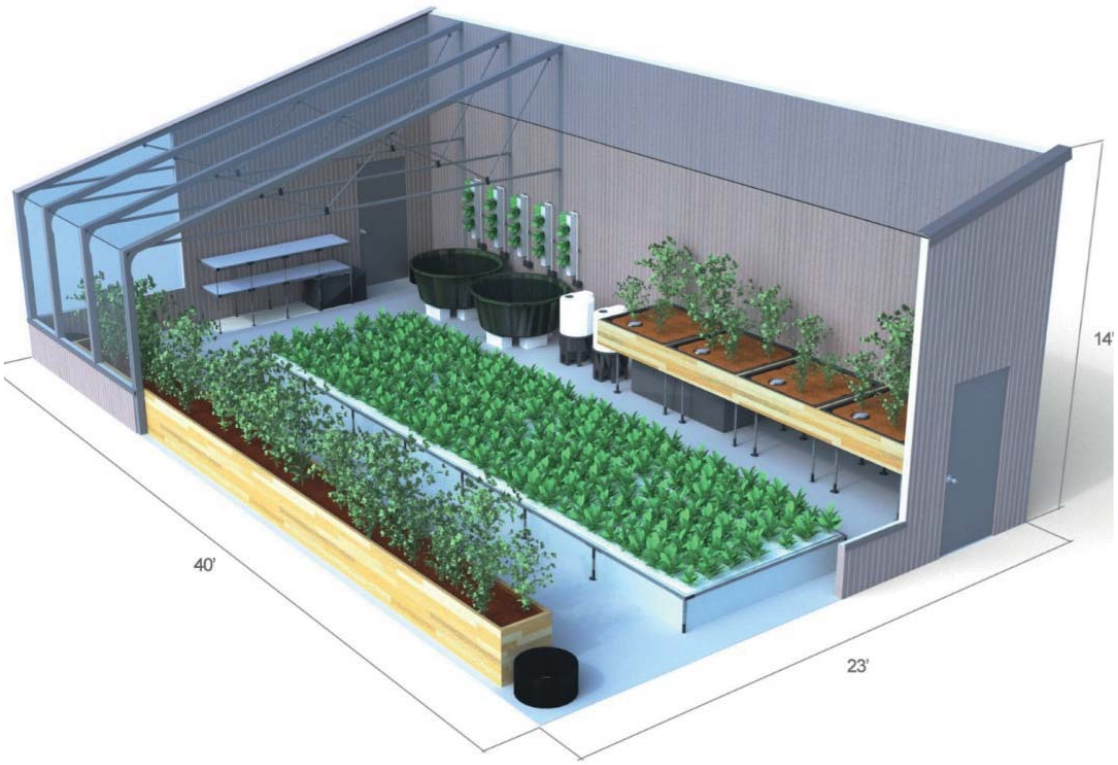
GREEN JOBS TRAINING
ENVIRONMENTAL STEWARDSHIP


Round-Arch
Gothic-Arch
Traditional
Gutter Connect
"Gothic" / Traditional
Wallpini
Passive Solar
Chinese
The Great Outdoors




14'
40'
23'

Credits

2 Nils Rehkop
4 http://www.ancient-origins.net/ancient-places-americas/ chinampas-floating-gardens-mexico-001537
5 Jan Bunse
6 Jan Bunse
7 Bernstein, Sylvia (2011): Aquaponic gardening. A step-by-step guide to raising vegetables and fish together. Gabriola, BC: New Society Publishers. p. 59
8 Rolf Morgenstern
9 (1) Taiz, Lincoln; Zeiger, Eduardo (2015): Plant physiology and development. Sixth edition. Sunderland, Massachusetts: Sinauer Associates, Inc., Publishers. p. 123;
(2) Schrader, Karl; Dietrich, Rainer (2011): Gewächshäuser und Heizungsanlagen im Gartenbau. Stuttgart: Ulmer. p. 20
(3) http://www.klassewasser.de/content/language1/html/6328.php
10 Timmons, Michael B. (2013): Recirculating aquaculture. [Place of publication not identified]: Ithaca Publishing Co. p. 666
11 Smeets, Peter J. A. M. (2011): Expedition agroparks. Research by design into sustainable development and agriculture in the network society. Wageningen, The Netherlands: Wageningen Academic Publishers. p. 152
12 Jan Bunse
13 Nils Rehkop
14 Nils Rehkop
15 Jan Bunse
16 Nils Rehkop
17 Nils Rehkop
18 Philips, April (2014): Designing urban agriculture. A complete guide to the planning, design, construction, maintenance and management of edible landscapes. p. 125
19 Nils Rehkop
20 Jan Bunse
21 Nils Rehkop
22 Rolf Morgenstern
24 Bigalow Broowk Farm / https://www.youtube.com/watch?v=FPjko9DDhcU
25 Luisa Ropelato
26 http://infarm.vn/he-thong-aquaponics-chuan/

Thank you!

Making performance measurable: nature-based solutions benefit assessment

Carlo Calfapietra

-National Research Council (CNR)
-Institute of Agro-Environmental and Forest Biology -ITALY

- European Commission

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"Solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience.

Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions"

Source: EU Research and Innovation policy agenda on Nature-Based Solutions

European Commission

European Commission leader in NBS and environmental protection

European Commission

On 19 November 2010, the European Commission organized a conference called Green Infrastructure Implementation

"Green Infrastructure serves the interests of both people and nature. **It can be defined as a strategically planned network of high quality green spaces and other environmental features**. ……..Green Infrastructure includes natural and semi-natural areas, features and green spaces in rural and urban, terrestrial, freshwater, coastal and marine areas."

On 6 May 2013

The Commission has adopted a Green Infrastructure Strategy, 'to promote the deployment of green infrastructure in the EU in urban and rural areas

What is NBS?





7

NBS IMPLEMENTATION PROCESS

- Multistakeholders
- Co-design; Co-implementation; Co-management
- Multipurpose
- Cost-effective
- Locally-adapted
- Easily upscaled spatially and temporally
- Effectiveness assessment

8

NBS' benefits

Modify Urban Microclimate

Save Energy

Reduce Noise

Reduce Runoff

Benefits society

Reduce Soil Erosion

Ecological functions

Improve Air Quality

Improve quality of life

Innovation

- Demand for knowledge:
  science > business interface
- New business models, products, services and solutions
- Emerging links with Smart Cities
- New funding and revenue streams

11

We are now able to quantify ES e DES provided by UF and NBS and this should emerge in all plans and projects

12

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CO-AUTHORS OF THE FRAMEWORK

Co-chairs: Christopher Raymond, Carlo Calfapietra, Niki Frantzeskaki

Members: Pam Berry, Margaretha Breil, Mihai R. Nita, Nadja Kabisch , Mark de Bel, Vera Enzi, Niki Frantzeskaki, Davide Geneletti, Marco Cardinaletti, Leor Lovinger, Corina Basnou, Ana Monteiro, Holger Robrecht, Gregorio Sgrigna, Laura Munari

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OBJECTIVE & AUDIENCE

OBJECTIVE 1 To develop an impact evaluation framework with a list of criteria for assessing NBS' performance in dealing with challenges related to climate resilience in urban areas

AUDIENCE
- Current and future European projects with an interest in nature-based solutions in urban areas
- Practitioners seeking to compare the effectiveness of NBS design, implementation and evaluation.

European Commission – investing > 100M Euros/yr in NBS until end of 2019. needs multiple lines of evidence to support future investments in ecosystem-based approaches in cities as part of FP 9 and beyond

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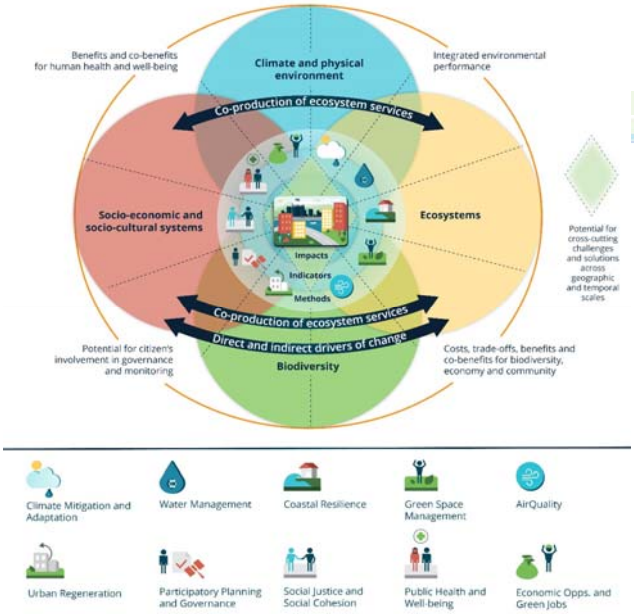

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IMPACT ASSESSMENT FRAMEWORK

Raymond, C.M., Frantzeskaki, N., Kabisch, N., Berry, P., Breil, M., Razvan Nita, M., Geneletti, D., Calfapietra, C. (2017). A framework for assessing and implementing the co-benefits of nature-based solutions in urban areas. *Environmental Science and Policy.* 77:15-24.

EKLIPSE
Knowledge & Learning Mechanism on Biodiversity & Ecosystem Services

EXAMPLE: COASTAL RESILIENCE

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Examples of methods for assessing the indicators
• Physical indicators: land-use and land cover changes, monitoring of physical parameters, number and extent of flooded areas, spatial analysis, GIS based spatial analysis and modelling (Cohen-Shacham et al., 2016; Langemeyer et al., 2016; Liu et al., 2014).
• Economic indicators: cost-benefits analysis, prices analysis, willingness to pay (Narayan et al., 2016).
• Social and education indicators: surveys, estimates on the potential of NBS tourism, number of visitors, number and extent of research and education programs (Petrosillo et al., 2006; Voyer et al., 2013).

EKLIPSE Knowledge & Learning Mechanism on Biodiversity & Ecosystem Services

EXAMPLE: COASTAL RESILIENCE

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Potential Actions	Expected impacts
• Use NBS against coastal storms and sea level rises (Yepsen et a., 2016) and protect the population from these risks in combination with engineered structures (Stark et al., 2016).	• Increased population and infrastructures protected by a cost-effective creation of NBS (Cohen-Shacham et al., 2016) and increased resilience of cities.
• Promote various NBS in coastal areas that can maintain or restore valuable coastal ecosystems and coastal biodiversity (Barbier, 2014).	• Better protection and restoration of coastal ecosystems including valuable species and habitats (Gedan et al., 2010).
• Integrate development and conservation objectives using a better quantification of ecosystem services (Piwowarczyk et al., 2013).	• Sustainable development of coastal regions and reduced conflicts over resources or land-use (Narayan et al., 2016).

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EKLIPSE Knowledge & Learning Mechanism on Biodiversity & Ecosystem Services

EXAMPLE: COASTAL RESILIENCE

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Examples of indicators	Measurement scale				
	Regional	Metropolitan	Urban	Street	Building
Physical indicators (Fagherazzi, 2014; Gedan et al., 2011; Grabowski et al., 2012; Stark et al., 2016).					
Shoreline characteristics and erosion protection	●	●			
Soil, temperature, drainage			●		
Flooding characteristics	●	●			
Economic indicators (Gedan et al., 2011; Narayan et al., 2016; Shuster and Doerr, 2015).					
Avoided damage costs			●	●	●
Changes in property value				●	●
Social and education indicators (Piwowarczyk et al., 2013; Schuster & Doerr, 2015).					

COST FP1204 GreenInUrbs

www.greeninurbs.com

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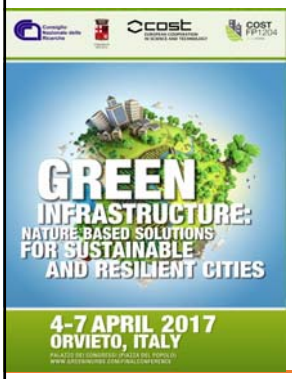

35 COST countries
4 Neighbour countries
2 non-COST countries
FAO
About 500 people involved

COST FP1204 GreenInUrbs

Workshops

proGIreg

CHAIRS AND SPEAKERS

COST FP1204 GreenInUrbs

Guidelines and tools for practitioners and policy makers

proGIreg

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COST FP1204 GreenInUrbs

Guidelines and tools

proGIreg

Specifind

Fill in the form specifying your interests and start searching for arboreal plants from which you can get more benefits.

Login

Search Species

Tree Hight
Height at Maturity — Min — Max — m

Locality
Nation: select
Locality: select

Benefits *
Pollutant Removal — Overall — Specific
Overall Rate: 0 (select)
Low VOC Emissions: 0 (select)
Low Allergenicity: 0 (select)
Carbon Storage: 0 (select)
Air Temperature Reduction: 0 (select)
Select All
Show in Report

Report
Estimate Values per Area Unit
Generate Report per: Specie — Genus
Show: All

In the report you will get a list of the most used tree species for urban greenery, arranged according to a score (rank) expressing the degree of compliance with chased requirements.

Climatic and site requirements are measured (if you specify the location), the correspondence to the possible required height and the value of the potential environmental benefits of species, weighted according to the specified scale of importance from 0 to 10 (*).

In the report there are reported indicative benefit estimates for single adult plant (or m^2), too, if required to display them.

Generate Report | Reset

proGIreg

What is Oppla?

oppla

The latest thinking on natural capital, ecosystem services and nature-based solutions

23

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Oppla case studies

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Oppla is a marketplace

Oppla is also
a marketplace

A place where
ideas can grow

proGIreg

THANKS for YOUR ATTENTION

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Consiglio Nazionale delle Ricerche

COST FP1204

proGIreg

World Forum on Urban Forests

Mantova, Italy - 28 November- 1 December, 2018

The Forestry Department of the Food and Agriculture Organization of the United Nations (FAO) the City of Mantova, the Politecnico di Milano and the Italian Society for Silviculture and Forest Ecology (SISEF) are organizing the 1st World Forum on Urban Forests, to be held in Mantova (Italy) in November 2018. Main objectives of the event are:

1. Support the process of the New Urban Agenda and optimizing the potential of urban forests in contributing to achieve the Sustainable Development Goals.
2. Strengthen the already existing international networking giving concrete opportunities to meet and exchange experiences and build partnerships.
3. Create an international appointment (through periodic worldwide meetings) for the urban forest and green infrastructure actors and stakeholders.
4. Prepare an international declaration including a set of recommendations for future collaboration on urban forestry towards a better quality of life of world cities.

COMUNE di MANTOVA

POLITECNICO MILANO 1863

SISEF

Contact person: Simone Borelli, Forestry Officer, Forestry Department: Simone.Borelli@fao.org

Food and Agriculture Organization of the United Nations

fao.org/forestry/urbanforestry

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Fachhochschule Südwestfalen
University of Applied Sciences

proGIreg

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Making nature-based solutions a business: replication strategies through business models

proGIreg Kick Off Conference
September 26th, 2018
Dortmund

Dr. Bernd Pölling, Prof. Dr. Wolf Lorleberg, Rolf Morgenstern
Fachhochschule Südwestfalen - University of Applied Sciences

proGIreg

proGIreg aim: self-sustained NBS businesses

- post-industrial urban regeneration important for cities' future attractiveness as places to live and locate businesses

Post-industrial urban sites	Urban green
• several hurdles for re-uses • contamination, access barriers, emissions, competition with open countryside, etc.	• expensive in maintaining certain qualities (public parks, etc.)

proGIreg approach:

NBS on post-industrial sites for implementing self-sustained business models

Outline

Business models

- Definition
- Business Model Canvas

Nature-based solutions // business models

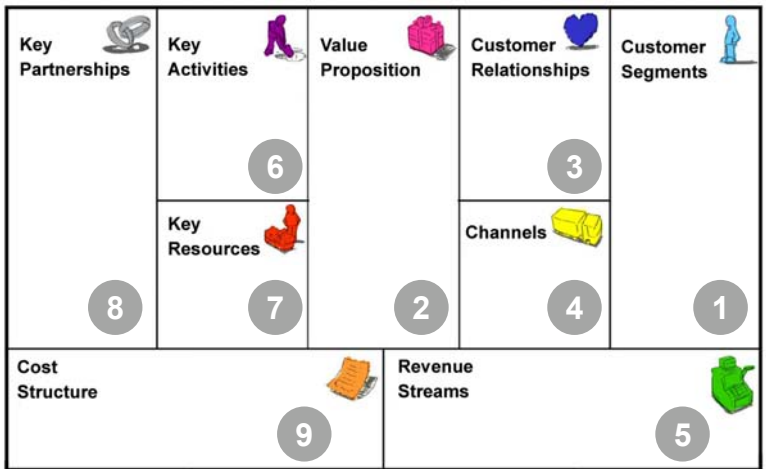
- NBS implementation into business models
- Urban Agriculture

Definition: Business models

- describe "the rationale of how an organization creates, delivers and captures value" (*Osterwalder and Pigneur, 2009*),
- represent the "design of organizational structures to enact a commercial opportunity" (*George and Bock, 2011*), and
- explain "how value is created for the customers and how value is captured for the company and its stakeholders" (*Henriksen, Bjerre, Almasi and Damgaard-Grann, 2012*).

Source: Trajectify

Business Model Canvas



adjusted from Osterwalder & Pigneur

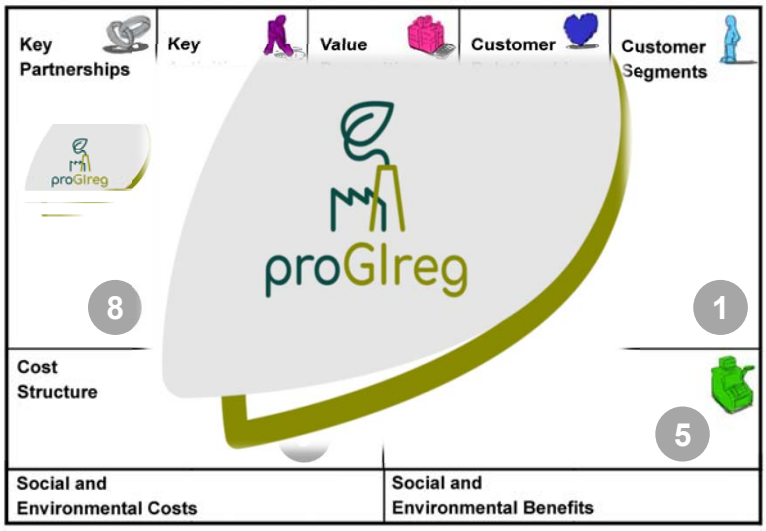
Nature-based solutions // business models

How can NBS be (part of) an urban business model?

- diversity of nature-based solutions (in urban areas)

> *„NBS are inspired and supported by nature, which are **cost-effective**, simultaneously provide **environmental, social and economic benefits** and help build **resilience**. Such solutions bring more, and more diverse, **nature and natural features and processes into cities**, landscapes and seascapes, through **locally adapted, resource-efficient and systemic interventions**." (European Commission)*

- diversity of businesses and business models



adjusted from Osterwalder & Pigneur

Urban Agriculture

Urban Agriculture – a nature-based solution for cities

Check Access Export

Urban Forestry & Urban Greening

Available online 25 July 2018

In Press, Corrected Proof

A stakeholder approach, door opener for farmland and multifunctionality in urban green infrastructure

Werner Rolf [a, b], Stephan Pauleit [a], Hubert Wiggering [b]

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https://doi.org/10.1016/j.ufug.2018.07.012 Get rights and content

Abstract

During the last years Urban Green Infrastructure (UGI) has evolved as a research focus across Europe. UGI can be understood as a multifunctional network of different urban green spaces and elements contributing to urban benefits. Urban agriculture has gained increasing research interest in this context. While a strong focus has been made on functions and benefits of small scale activities, the question is still open, whether these findings can be up-scaled and transferred to the farmland scale. Furthermore, multifunctionality of urban and peri-urban agriculture is rarely being considered in the landscape context. This research aims to address these gaps and harnesses the question if agricultural landscapes – which in many European metropolitan regions provide significant spatial potential – can contribute to

sustainability MDPI

Review

The Role of Urban Agriculture as a Nature-Based Solution: A Review for Developing a Systemic Assessment Framework

Martina Artmann * and Katharina Sartison

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* Correspondence: m.artmann@ioer.de; Tel.: +49-351-46-79-231

Received: 20 April 2018; Accepted: 6 June 2018; Published: 9 June 2018

check for updates

Abstract: Urbanization and achieving sustainable agriculture are both major societal challenges. By reducing food miles and connecting people with nature, food cultivation in cities has several major advantages. However, due to further urban development (peri-) urban agriculture (UPA) is under threat. To strengthen UPA, we argue for considering UPA as a nature-based solution (NbS) supporting systemic approaches for societal challenges. However, academic knowledge on UPA's contribution to various societal challenges of urbanization is still fragmented. This study addresses the gap by conducting a systemic literature review, incorporating 166 academic articles focusing on the global north. The results of the review show that UPA contributes to ten key societal challenges of urbanization: climate change, food security, biodiversity and ecosystem services, agricultural intensification, resource efficiency, urban renewal and regeneration, land management, public health, social cohesion, and economic growth. The value of UPA is its multifunctionality in providing social,

Urban Agriculture

Urban Agriculture – a nature-based solution for cities

- UA contributes to ten societal challenges

No.	Challenges and Relevant Fields of Action
1	Climate change (including climate change adaption and mitigation, carbon sequestration)
2	Food security (including food safety, food justice)
3	Biodiversity and ecosystem services
4	Agricultural intensification (including organic farming, sustainable agriculture)
5	Resource efficiency (including energy efficiency, water protection, urban water, life cycle assessment)
6	Urban renewal and regeneration (including abandoned land, brownfields, vacancy)
7	Land management (including land take, soil sealing, soil degradation, soil erosion, green space management, governance, green infrastructure)
8	Public health (including, well-being, quality of life)
9	Social cohesion (including social justice, participation, awareness, civic agriculture)
10	Economic growth (including green jobs, innovation, cost-effectiveness)


The Role of Urban Agriculture as a Nature-Based Solution: A Review for Developing a Systemic Assessment Framework

Artmann & Sartison, 2018

Urban Agriculture

The 8 nature-based solutions of proGIreg

1. Renaturing landfill sites for leisure use and energy production
2. New regenerated soil thanks to biotic compounds for urban forestry and urban farming
3. Community-based urban farming and gardening on post-industrial sites
4. Aquaponics as soil-less agriculture for polluted sites
5. Capillary GI on walls and roofs
6. Making post-industrial sites and renatured river corridors accessible for local residents
7. Establishing protocols and procedures for environmental compensation at local level
8. Pollinator biodiversity improvement activities and citizen science project

Urban Agriculture

NBS 2: Community-based urban farming and gardening

- Social innovation
- ‘Co-Production’ / ‚Co-Creation‘
- ‚Prosumer‘

- Participation of consumers / city dwellers in:
  - Production and harvesting
  - Processing
  - Marketing
  - Consumption
  - Waste management
  - Business management / decision-making / financing

Urban Agriculture

NBS 2: Community-based urban farming and gardening

- **Alternative Food Networks**
  - Community Supported Agriculture
  - Rent-a-field / Rent-a-garden
  - Food Coops / (Solidary) Purchasing Groups



Photos: Elmar Schulte-Tigges / Julia Welkoborsky

Urban Agriculture

NBS 2: Community-based urban farming and gardening

- **Possible production types on post-industrial sites**
  - …
  - Food Forests
  - Orchards
  - Permaculture
  - Market gardens
  - SPIN farming *(**S**mall **P**lot **IN**tensive)*
  - Aquaponics
  - Microgreens
  - …

Indicators of measurement

Urban Agriculture

NBS 2: Community-based urban farming and gardening

- **Possible production types on post-industrial sites**
  - …
  - Food Forests
  - Orchards
  - Permaculture
  - Market gardens
  - SPIN farming *(**S**mall **P**lot **IN**tensive)*
  - **Aquaponics**
  - Microgreens
  - …

Indicators of measurement

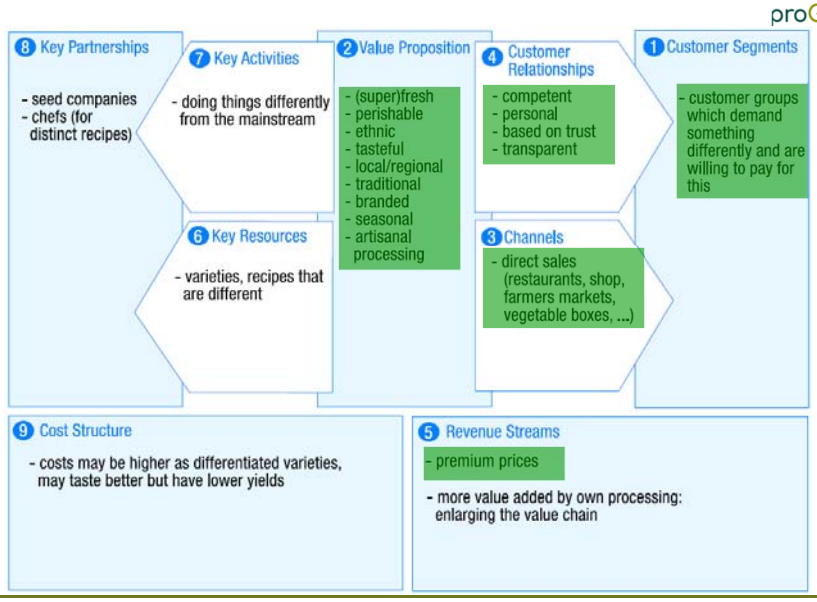
Replication strategies through business models

- NBS integration into business models on post-industrial sites
- can learn from existing classifications of UA business models

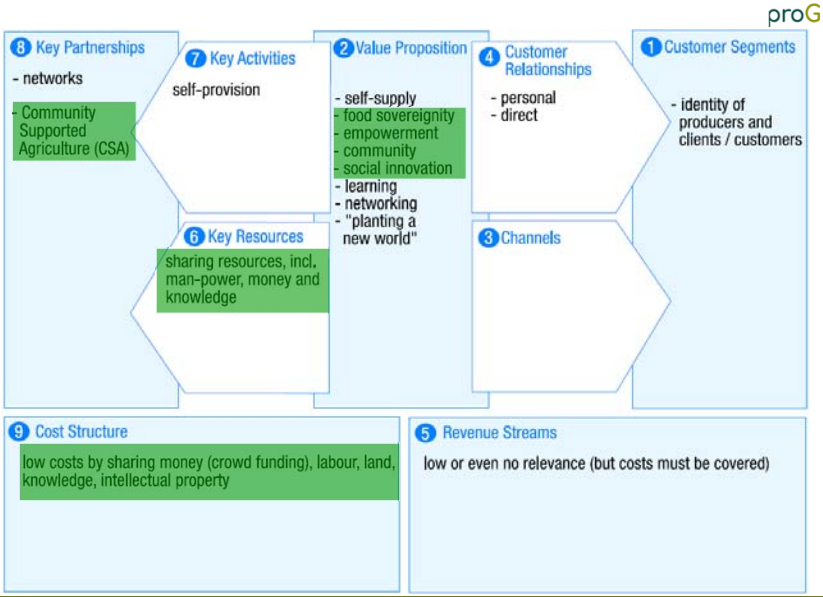
UA business model*	Key features		
Cost reduction	Specialization	Economies of scale	Urban resources
Differentiation	USPs	Short food chains	High-quality production
Diversification	Product diversity	On-farm services	Multifunctionality
Shared Economy	Social innovation	Co-Production	Alternative Food Networks
Experience	‚Selling a story'	‚Aha' effect	Authentic / memorable
Experimental	Tech innovation	R&D	Aquaponics, Vertical

**: classification of UA business models based on EU COST-Action „Urban Agriculture Europe" and erasmus+ „URBAN GREEN TRAIN"*

Example: differentiation



Example: shared economy



Urban Agriculture

The 8 nature-based solutions of proGIreg

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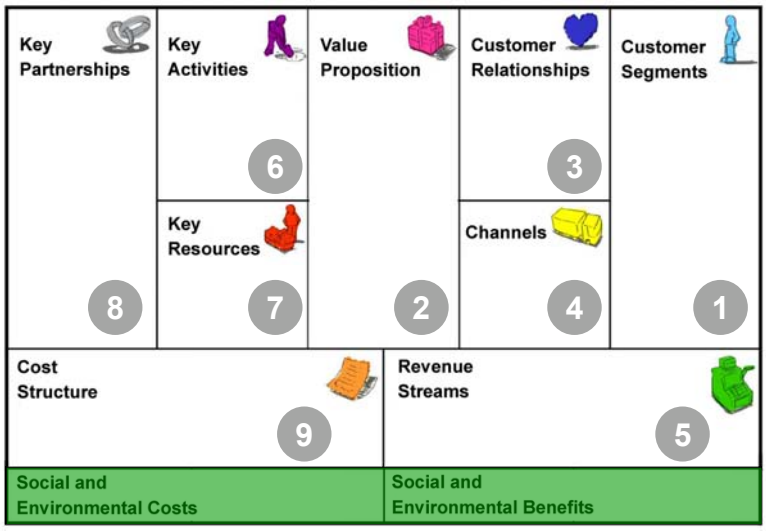
Business Model Canvas



adjusted from Osterwalder & Pigneur

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Thanks for your attention!
Any remarks or questions?

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