RETHINKING PARKS IN A SHRINKING SETTING

The Marrying of Social Restoration and Nitrate Remediation for a New Urban Park Model in Parkstad Limburg




North Sea
The Netherlands
Belgium
Germany
France
Luxembourg
Beekdaelen
Brunssum
PARKSTAD
Landgraaf
Heerlen
Voerendaal
Kerkrade
SOUTH LIMBURG
Simpelveld


North Sea
The Netherlands
Belgium
Germany
France
Luxembourg
Beekdaelen
Brunssum
PARKSTAD
Landgraaf
Heerlen
Voerendaal
Kerkrade
SOUTH LIMBURG
Simpelveld

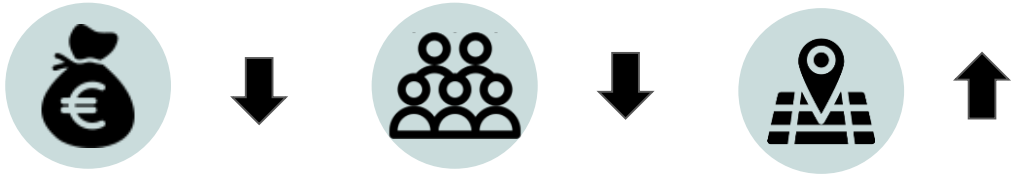
From Black to Green







URBAN SHRINKAGE





Fascination & Motivation







Park Heilust, kerkrade

Designed by Buro Lubbers

- Bad social condition in the neighbourhood, vacant housing
- Started from 2011 over 500 degraded houses/ apartments were demolished for this park

Fascination & Motivation







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Fascination & Motivation





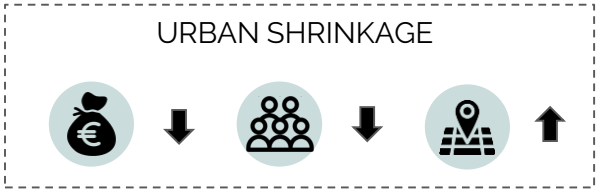
"As good as it is in Heilust, you don't see it anywhere in Parkstad and perhaps not in the whole of the Netherlands. Heilust has changed enormously. In a **positive** sense"

sociologist Maurice Hermans
of the Neimed knowledge institute in Heerlen

Park Heilust, kerkrade
Designed by Buro Lubbers

Fascination & Motivation





Positive change but a ‘negative investment’ :(

Park Heilust, kerkrade

Designed by Buro Lubbers

Fascination & Motivation

Parks become a ‘losing investment’...

What does ‘Park’ mean in ‘Parkstad’?

What values can ‘park’ bring to define its own existence?

Fascination & Motivation

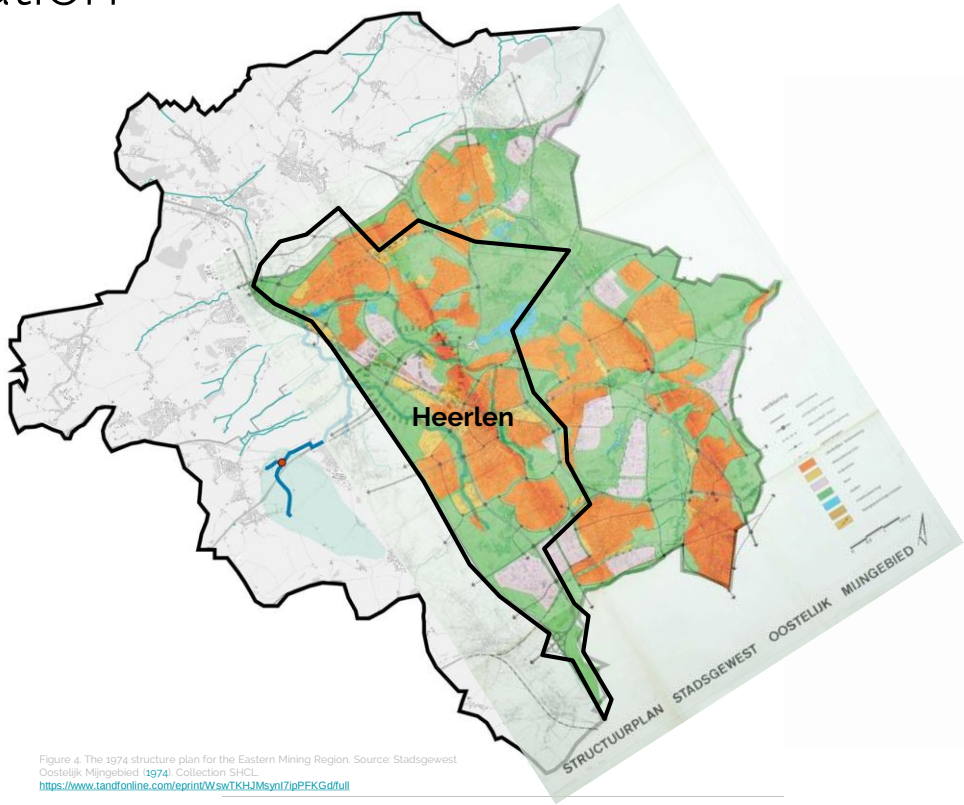


Figure 4. The 1974 structure plan for the Eastern Mining Region. Source: Stadsgewest Oostelijk Mijngebied (1974). Collection SHCL.
https://www.tandfonline.com/eprint/WSwTKHJMsynI7ipPFKGd/full

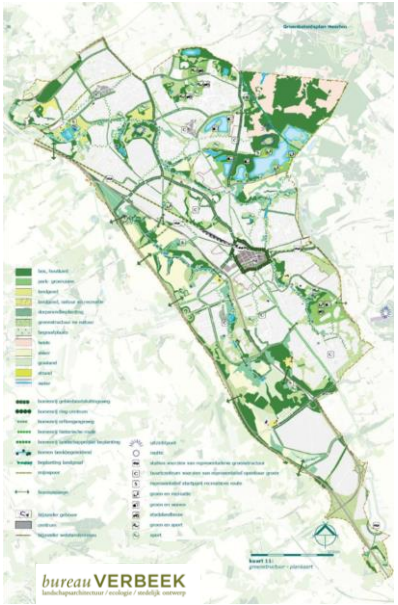
Parkstad

Meaning of name from ->
high green ratio ->
from Garden-city concept

Fascination & Motivation

Meaningless public green in daily setting

Highest green ratio ≠ **Perceived** or **Daily** green









Heerlen



Research indicates that Heerlen is one of the 'greenest' cities in The Netherlands with respect to presence of (public) **green areas. However, residents do not perceive it as such, because many of these** public green areas are not accessible (Gemeente Heerlen, 2004b). P.168

Berg, L. V. D., Pol, P. M., Mingardo, G. J., & Speller, C. undefined. (2006). The Case of Heerlen. The Safe City, 159–178..

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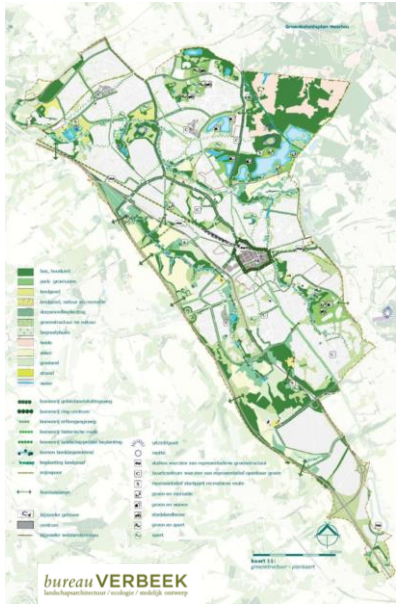







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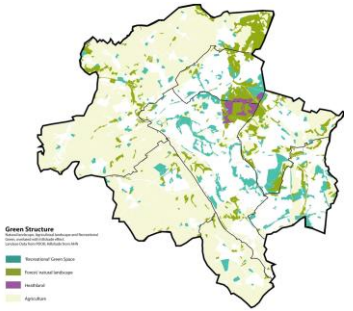
Tourism oriented







1. **Problem statements**

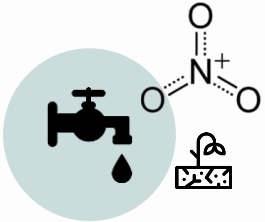
2. **Research Question, design concept, design aim**

3. **DESIGN**

- Masterplan
- Focus area Site Design
- Spatial experience



Pressing Need:
Social problem



Upcoming threat:
Nitrate contamination



Post-industrial aftermaths: Social problem

- lost of identity

- Unemployment

- feel low in control

- poor mental wellbeing
(loneliness, dissatisfaction with environment, etc)

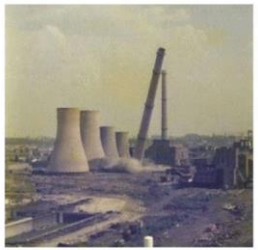
- low social participation and cohesion



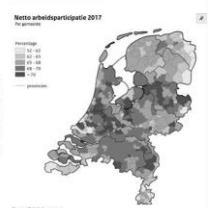
‘I was very disappointed when I started my job in 1977 and found an area over here where people were very sad, disappointed, thrown back and showed a great lack of initiative and entrepreneurship. Sitting back and lamenting, that is not my stand. I knew how proud miners were, and all that pride had disappeared. ‘

Sjeng Kremers, former governor of province of Limburg (2012)

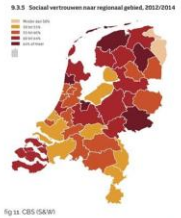
Loss of Identity



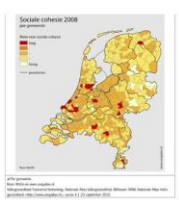
Unemployment



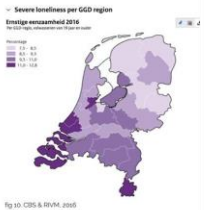
Low in Social Trust



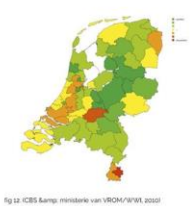
Low Social Cohesion



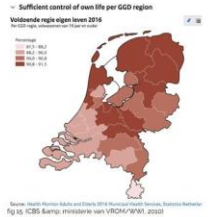
Loneliness/ mental wellbeing



Dissatisfaction with Living Enviornment



Low Control Over Life





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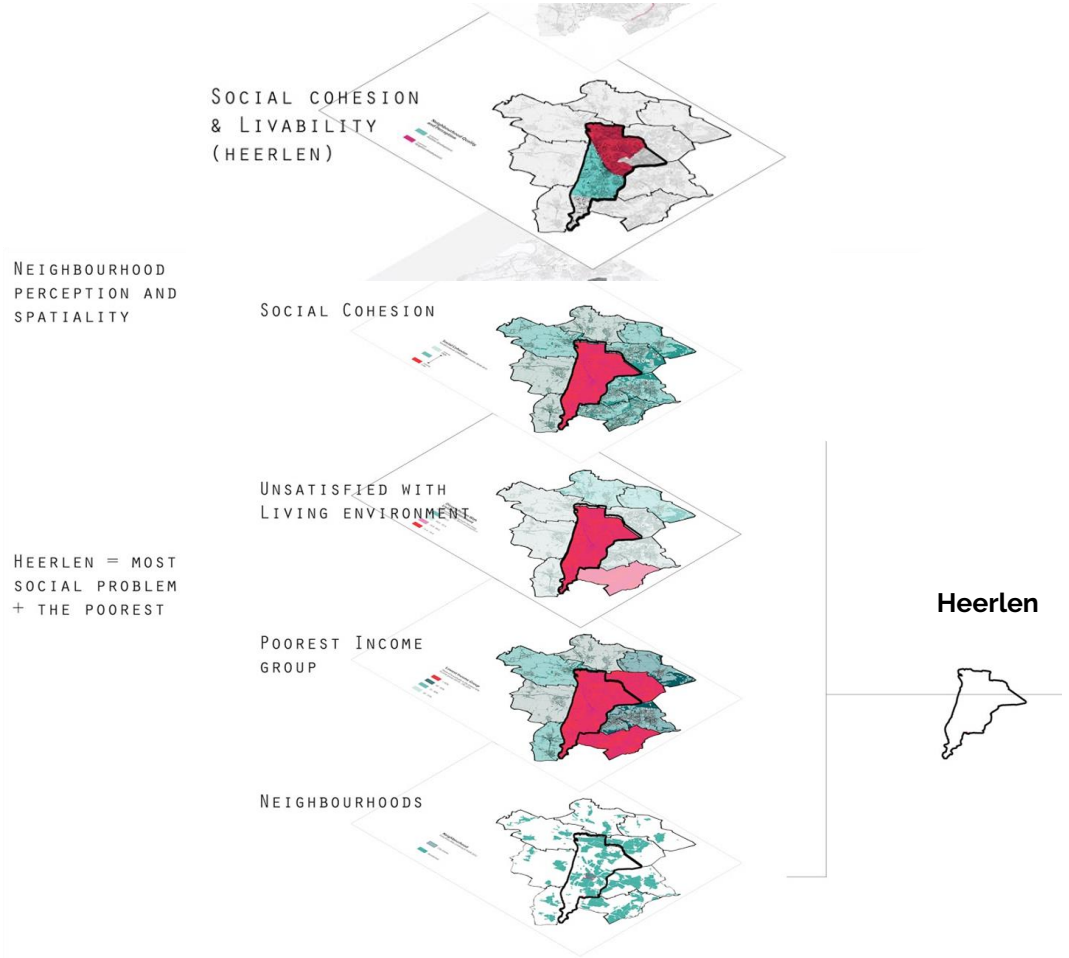
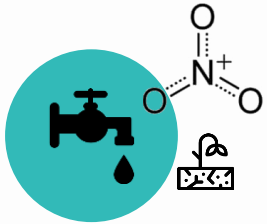
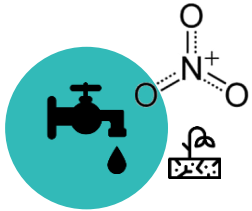




Pressing Need:
Social problem



Upcoming threat:
Nitrate contamination



Nitrate contamination in groundwater

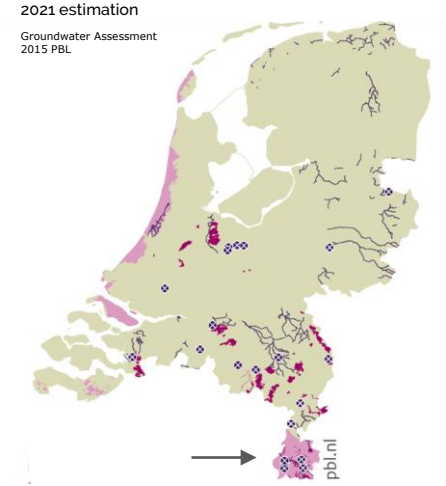


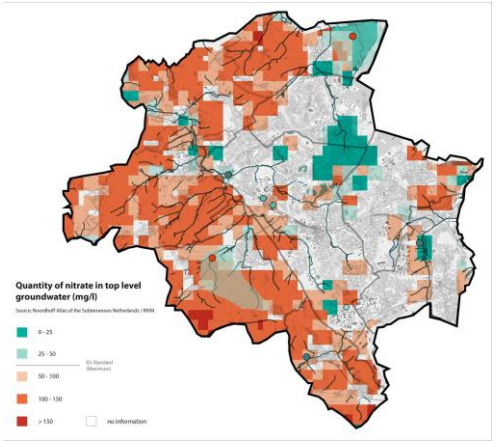
NITRATE

-a form of nitrogen found in most fertilizers, manure, and liquid waste

- threatens drinking water and biodiversity

- hard to get rid of, past chemical traces remain in water system

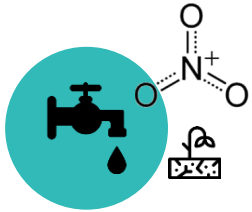






Drinking water is threatened!
Biodiversity is threatened!

https://themasites.pbl.nl/balansvandeleefomgeving/jaargang-2018/themas/water/kwaliteit-grondwater



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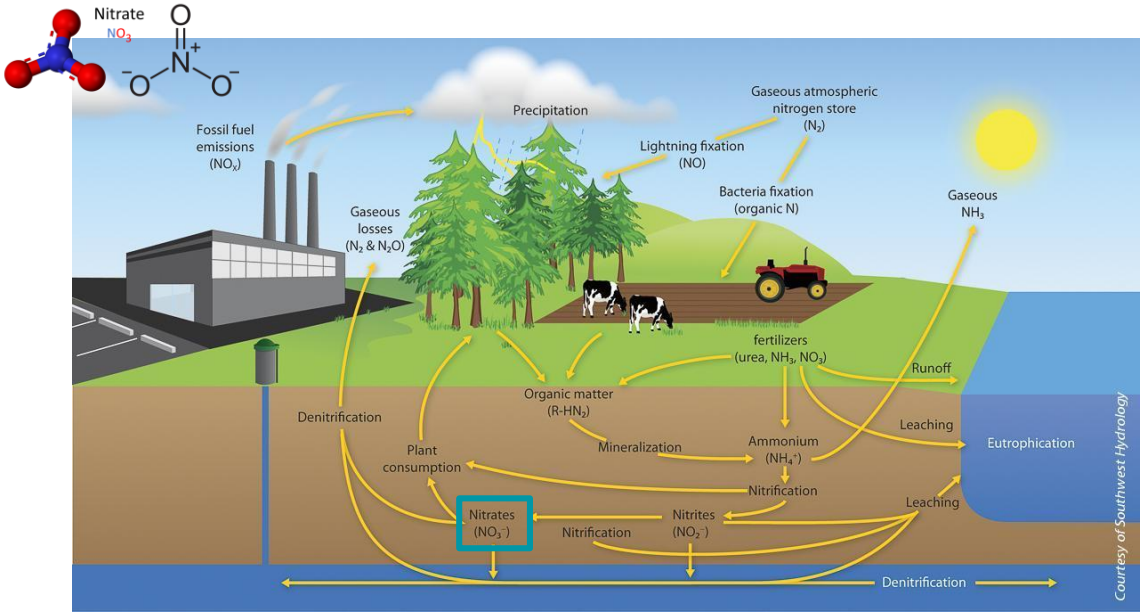
Nitrate is a form of Nitrogen present in soil and water



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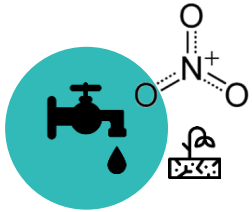

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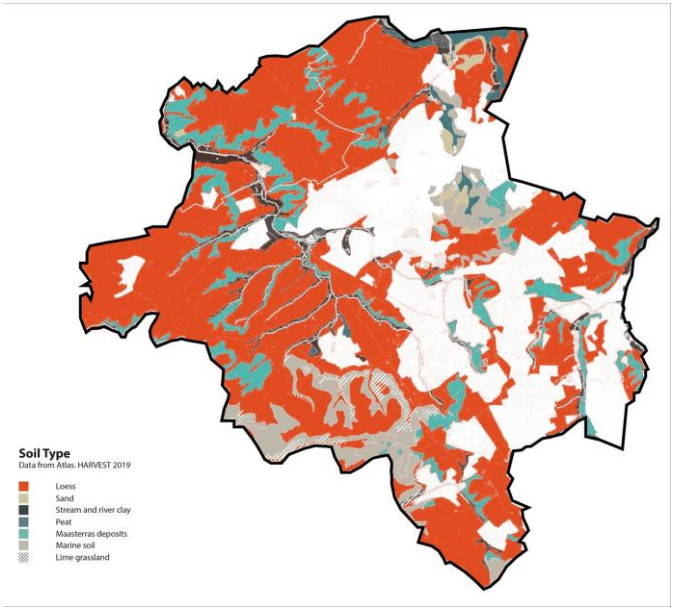
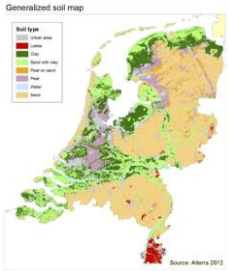
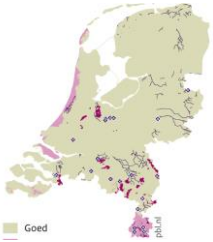
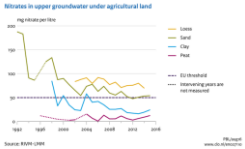


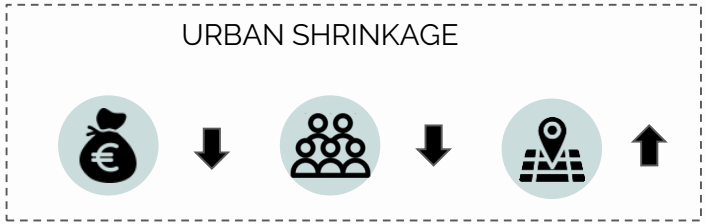




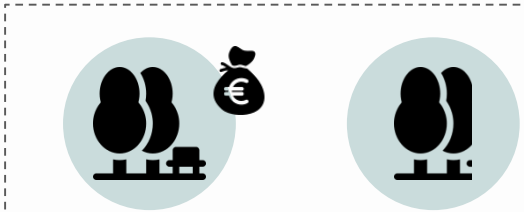


Parkstad's soil type (Loess) causes more nitrate leaching into groundwater

Context



What does Park mean in Parkstad?



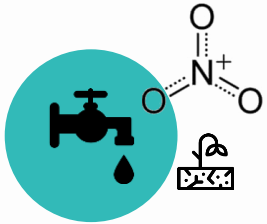
Parks in shrinking city becomes negative investment

Meaningless public green in daily setting

2 Key problems:



Pressing Need: Social problem



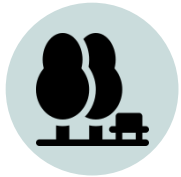
Upcoming threat: Nitrate contamination

Problems

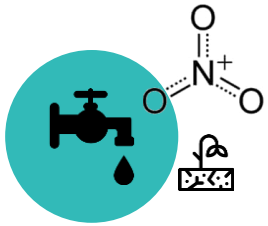
Current solution



Social problem



Parks as social infrastructure

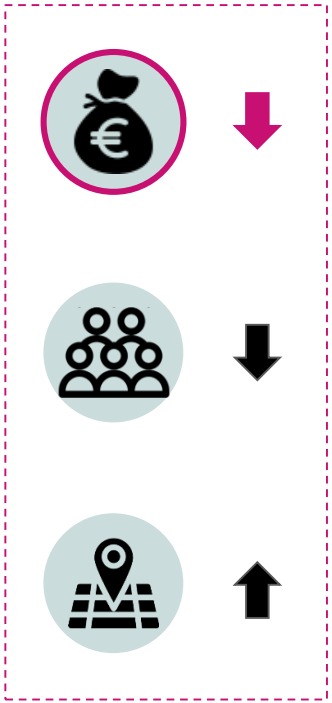


Nitrate contamination



Water purification

Context:
Shrinkage



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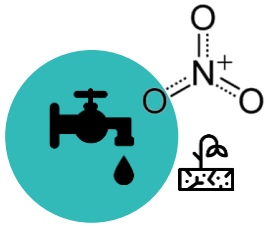

Nitrate contamination



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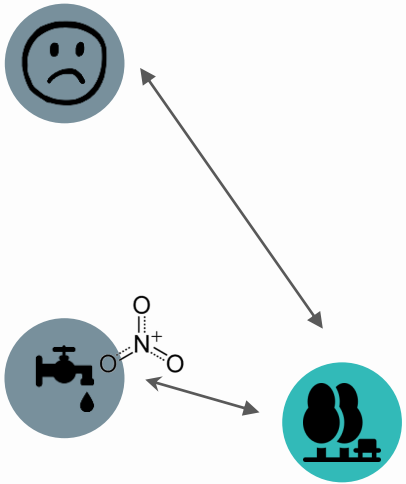
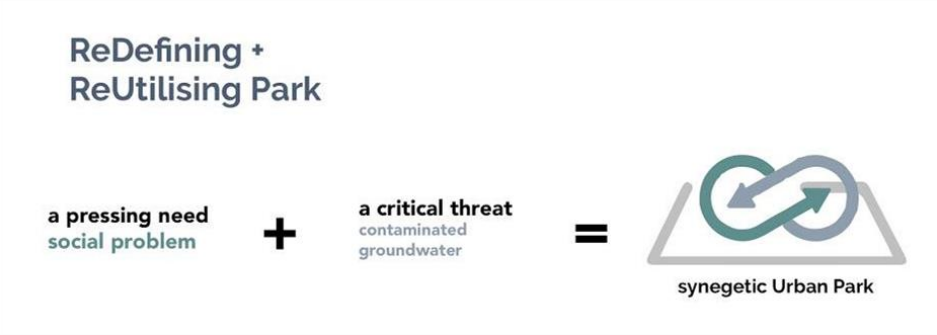


Cross-domain, hybrid
Park's potential not utilised!

Multiple values and share-cost

The role of ‘parks’ in Parkstad is underdefined, the hybrid potential of parks in terms of social restoration and environmental service is underutilised.

How to **redefine and reutilise** 'park' through **the marrying of social restoration** and **nitrate remediation** in order to create a new **urban park model that carries multiple values**?



The MARRYING of



&



For a new mode of



DESIGN INGREDIENTS
Research findings in a nutshell

Philosophical backbone & inspiration

‘Nitrate’ technique

Azolla (water fern)

Alnus tree

Pump & treat method (groundwater)

‘Social’ Principles

(Repeated) Interactions with other residents or social networks

Participation in collective community activities

Pride or sense of place

Environmental preference (psychology)

‘Park’ philosophy

Garden city:
- ‘Cooperative commonwealth’
- Shared profits and roles
- Stewardship
- Community life

Park Value:
- ‘Instrumental’
('park as 'means to achieve human-desired outcome')
- ‘Functional’
('park contributes to values without intervention of human consciousness')

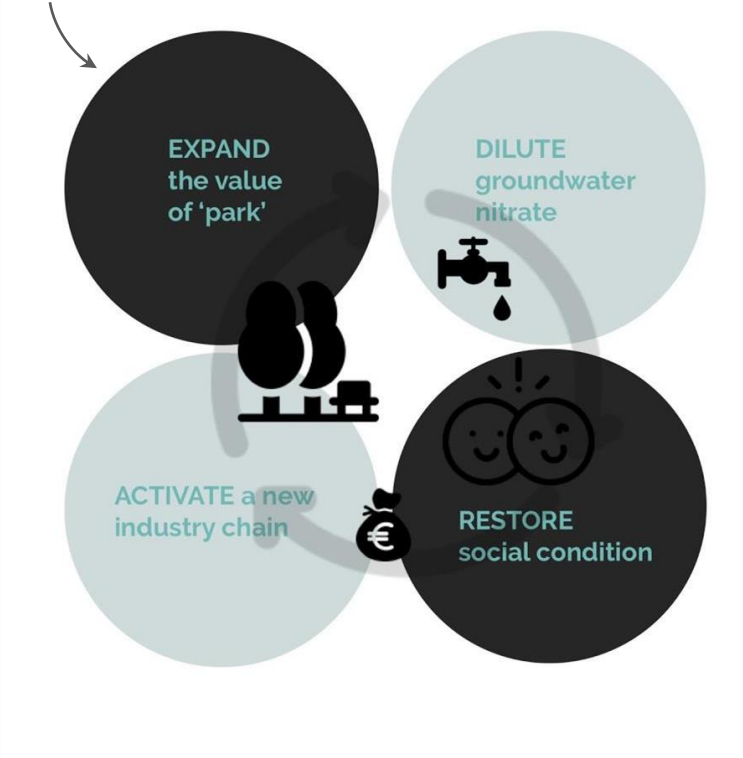
A Co-owned Azolla City Park

in Heerlen



AIM

To be valuable instead of a burden/ luxury



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in Heerlen

WHAT IS AZOLLA?

- Most effective plant for nitrate-removal (special bacteria)
- Easy Participation
- Useful Crop





(see fig 21)



(see fig 22)



fig 34. Sjödin, E. (2010). The Azolla Cooking and Cultivation Project. source: http://www.gemenskapspraktik.se/projects/theazollacookingandcultivationproject/



fig 35. Sjödin, E. (2010). Azolla bread. source: http://www.gemenskapspraktik.se/projects/theazollacookingandcultivationproject/



fig 36. Azolla as livestock feed. source: sotraya.blogspot.com



fig 37. Azolla turning red. Source: Nicholls, D. (2009). Watermead Country Park. photograph. https://www.naturespot.org.uk/species/water-fern.

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Compost



Renewable Energy



Animal feed



Human Food



(see fig 21)



(see fig 22)



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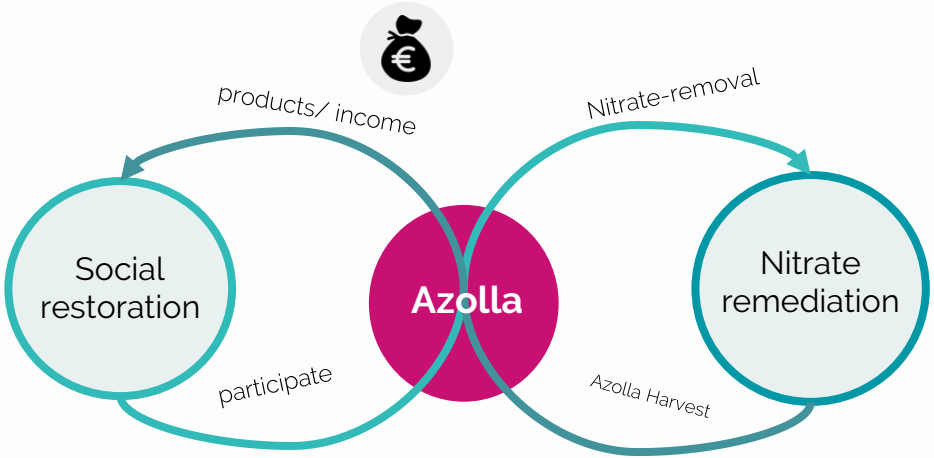
How to create mutual serving synergy?



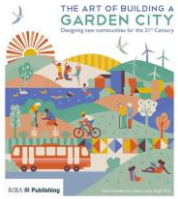
Azolla is the key to create this social-nitrate SYNERGY

Co-Ownership & Empowerment

Inspiration



luchtsingel



Garden city:
- 'Cooperative commonwealth'.
- Shared profits and roles
- Stewardship
- Community life

Individual small donation

- Crowdfund project

small investment (buying share)

- Public owned
'azolla-park-Co-Op'

- Azolla products:
(azolla as compost, Animal feed or superfood for human)
- on-site Cafe/ restaurant/ urban farming

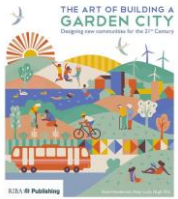
Profit return

- investment from other sector
- Research institution
- New start-ups working with Azolla
- water/ juice company

Inspiration



luchtsingel



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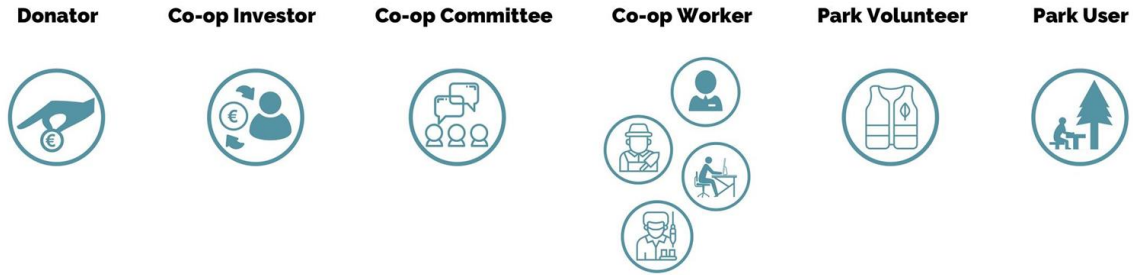
Azolla Park Cooperative



Azolla City Park - Public Involvement and Participationary Roles



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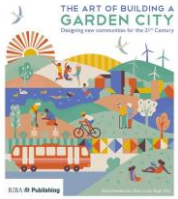

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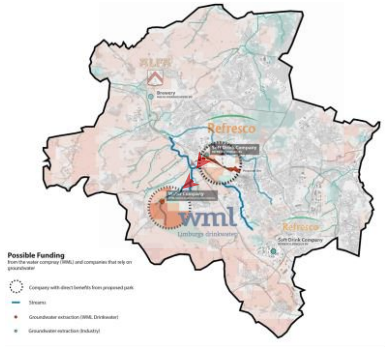
small investment (buying share)

- Public owned
'azolla-park-Co-Op'

- Azolla products:
(azolla as compost, Animal feed or superfood for human)
- on-site Cafe/ restaurant/ urban farming

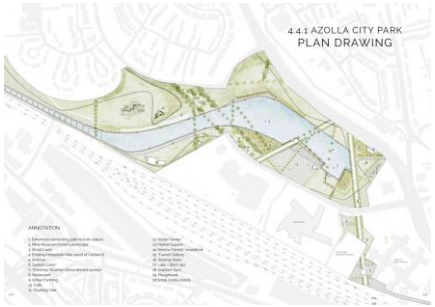
Profit return

- investment from other sector
- Research institution
- New start-ups working with Azolla
- water/ juice company

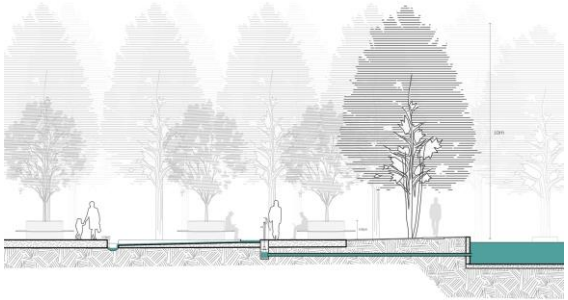




Masterplan level:
Site Strategy, System



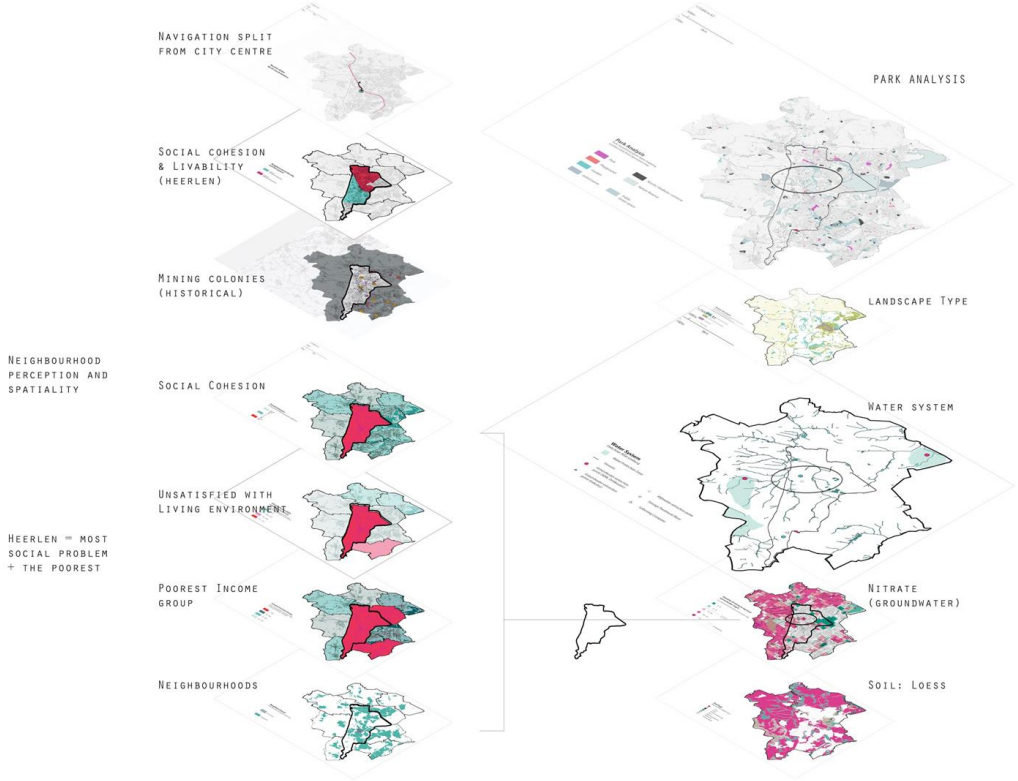
Focus Area:
Spatial design, connection with surrounding



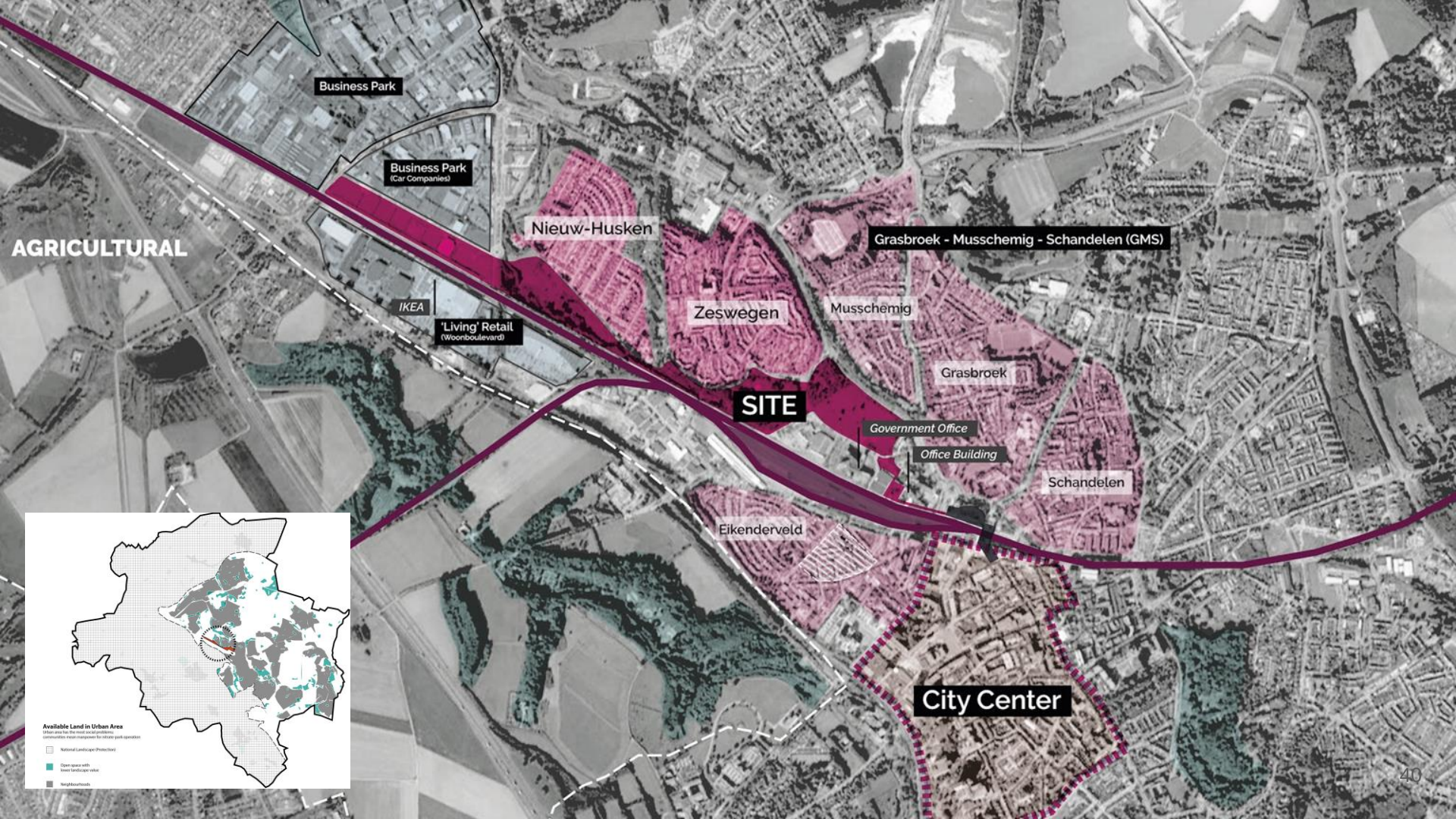
THE DESIGN

A Co-Owned Azolla City Park

Layered approach



Social potential x Nitrate-water potential


Business Park
Business Park
(Car Companies)
AGRICULTURAL
Nieuw-Husken
Grasbroek - Musschemig - Schandelen (GMS)
IKEA
'Living' Retail
(Woonboulevard)
Zeswegen
Musschemig
Grasbroek
SITE
Government Office
Office Building
Schandelen
Eikenderveld
City Center
Available Land in Urban Area
Urban area has the most social problems,
communities mean manpower for nature-park operation
National Landscape (Protection)
Open space with
lower landscape value
Neighbourhoods

Business Park

Business Park
(Car Companies)

AGRICULTURAL

Nieuw-Husken

Grasbroek - Musschemig - Schandelen (GMS)

IKEA

'Living' Retail
(Woonboulevard)

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SITE

Government Office

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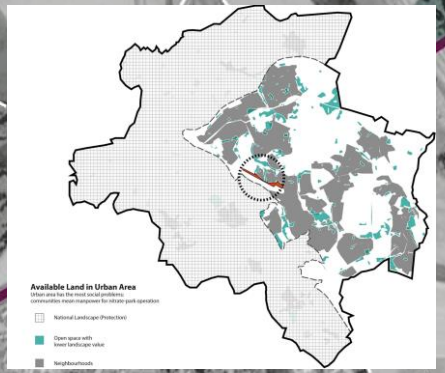
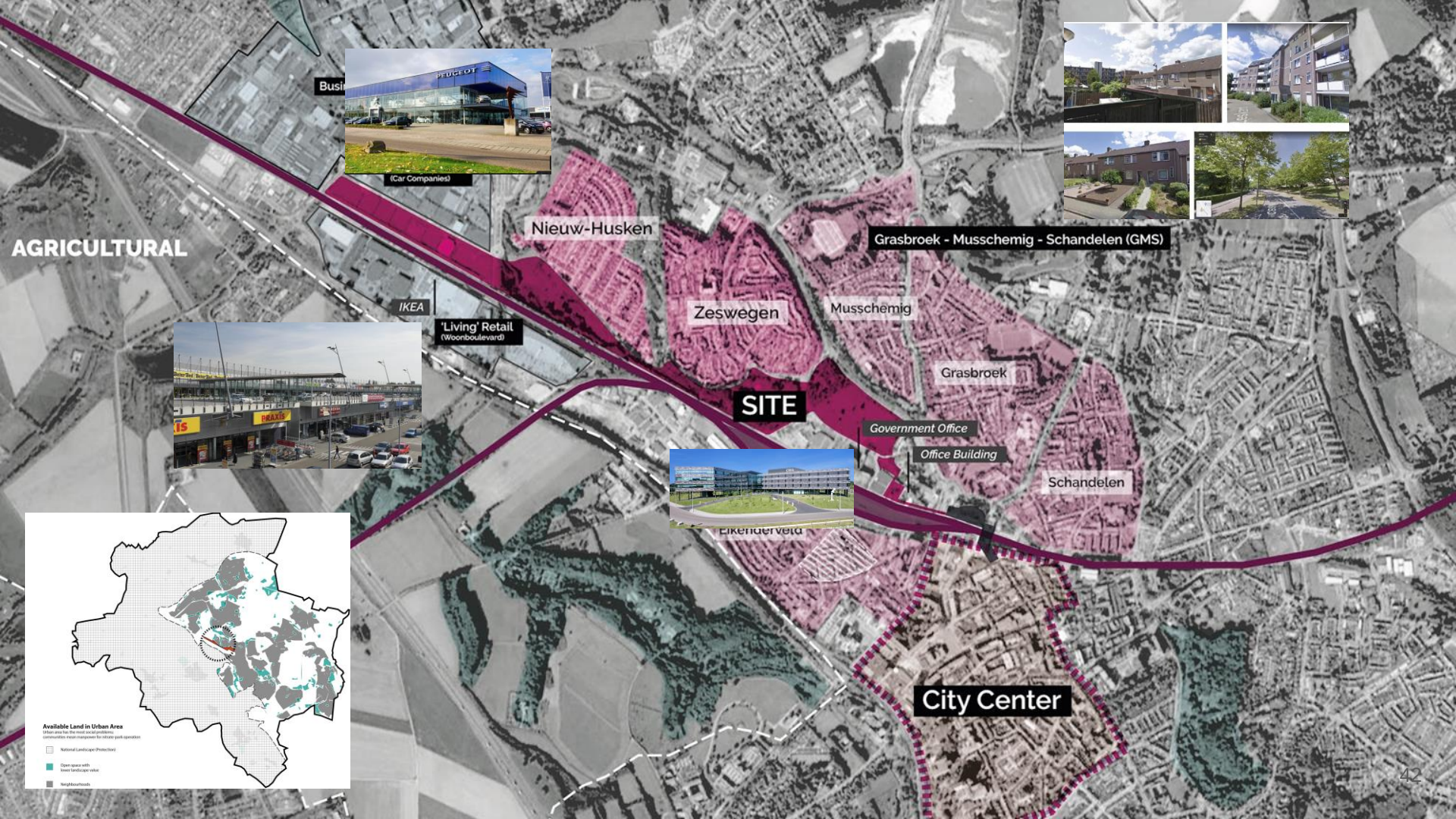
City Center








PEUGEOT
(Car Companies)
AGRICULTURAL
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'Living' Retail
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City Center
Available Land in Urban Area
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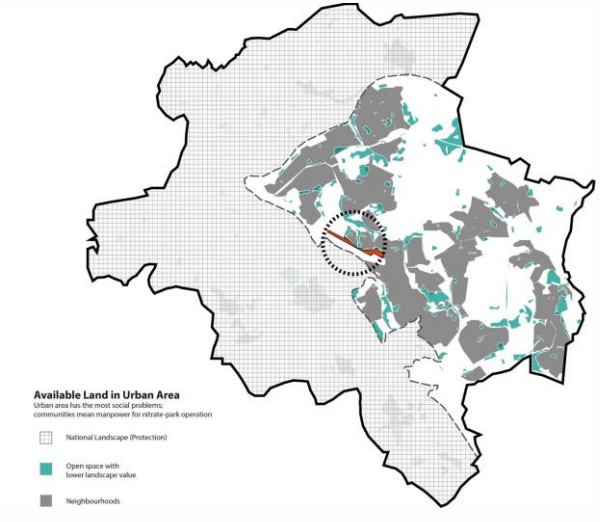
Open space with lower landscape value
Neighbourhoods

Site


Available Land in Urban Area
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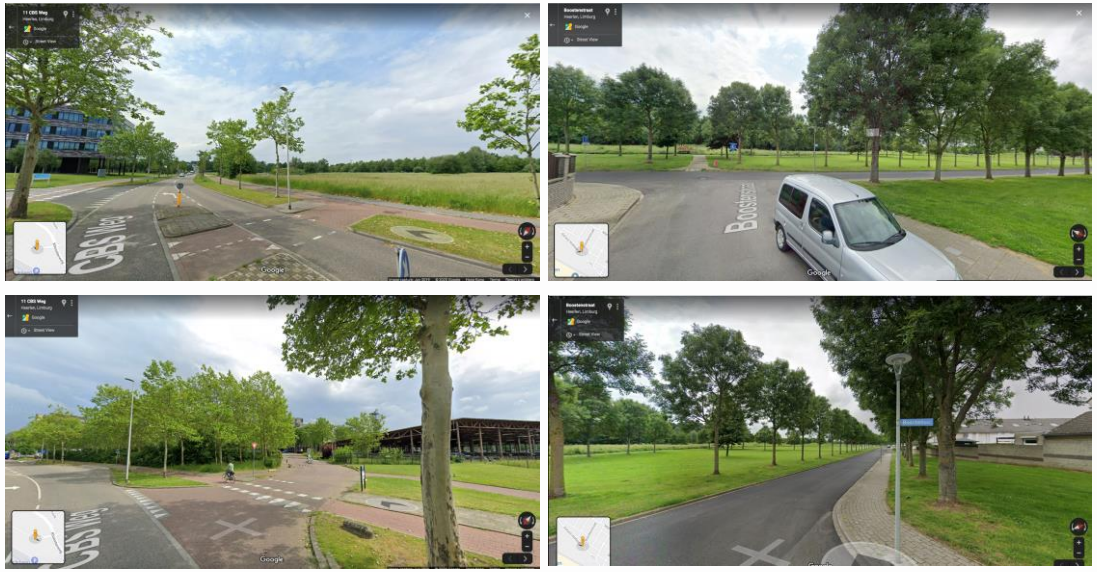
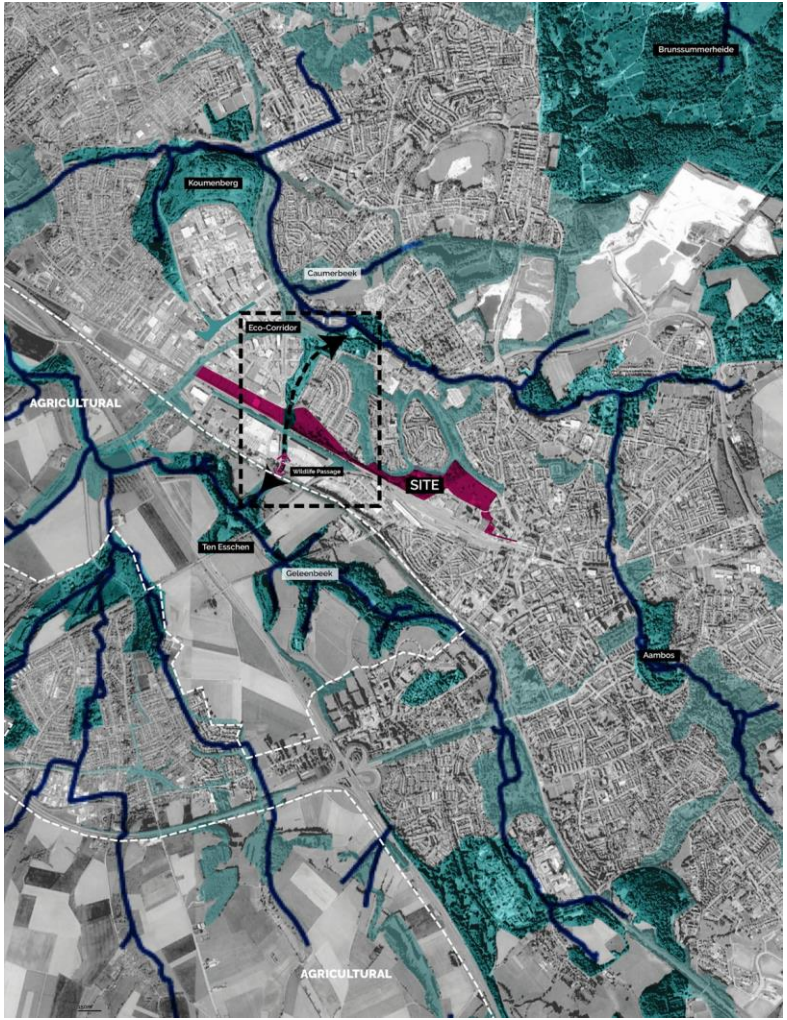
National Landscape (Protection)
Open space with
lower landscape value
Neighbourhoods



1. Relationship with G&B Network -

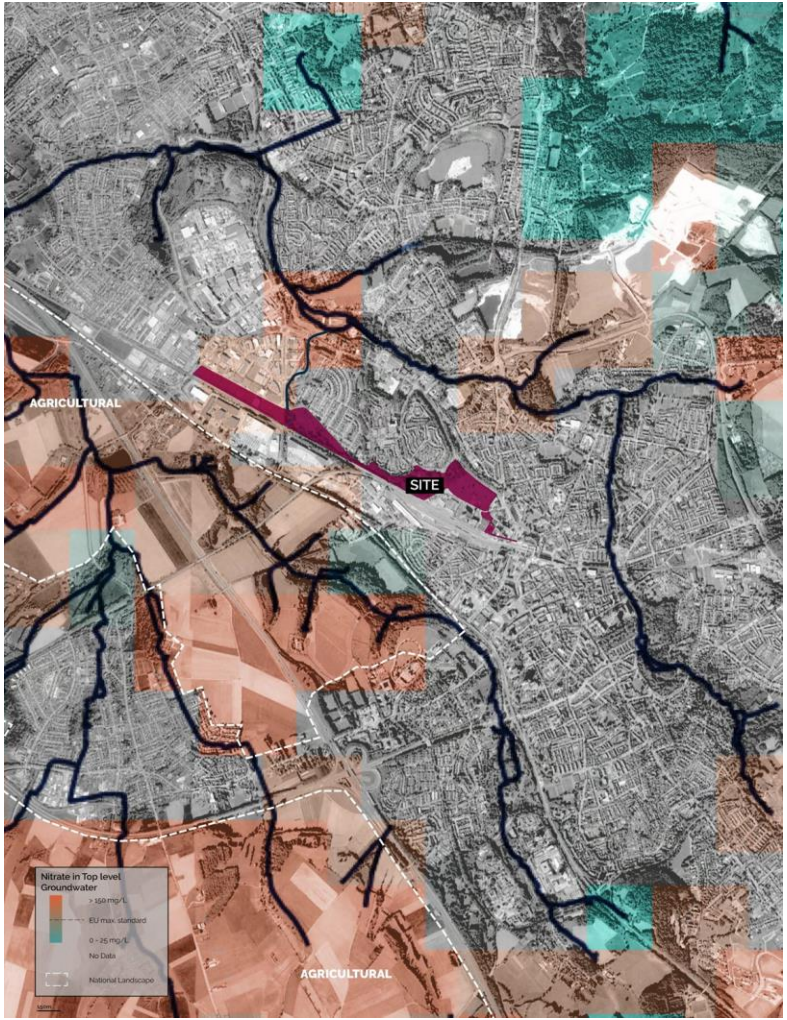
Maintain Eco-Corridor

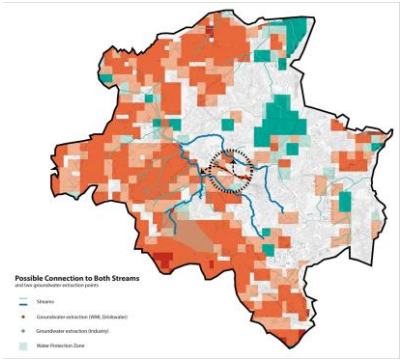


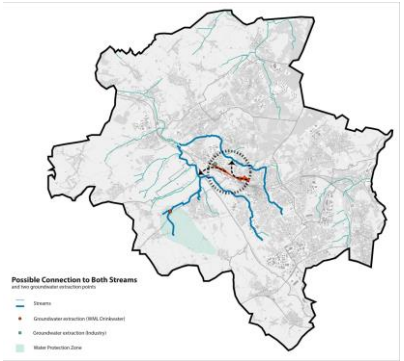
2. Groundwater Nitrate diluting Device

Diluted water will be release to nearby brooks and back to the natural water system

Pump & Treat







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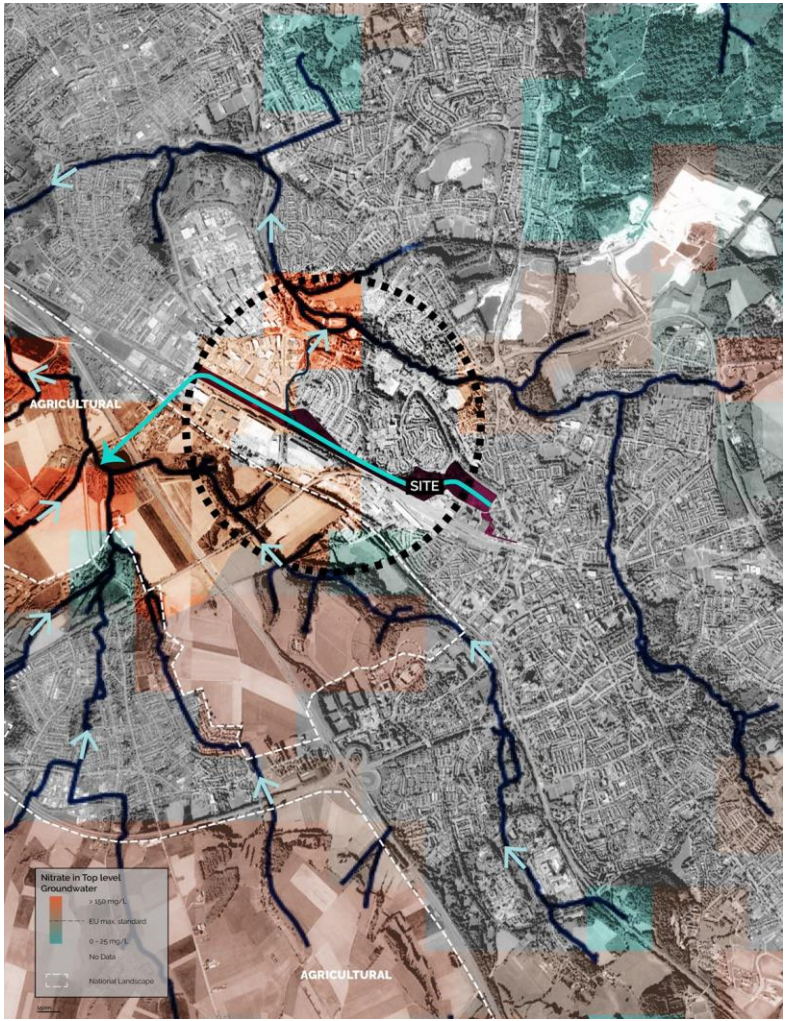
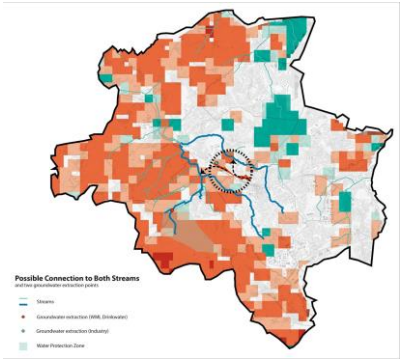
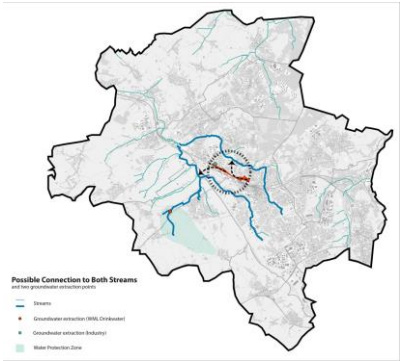
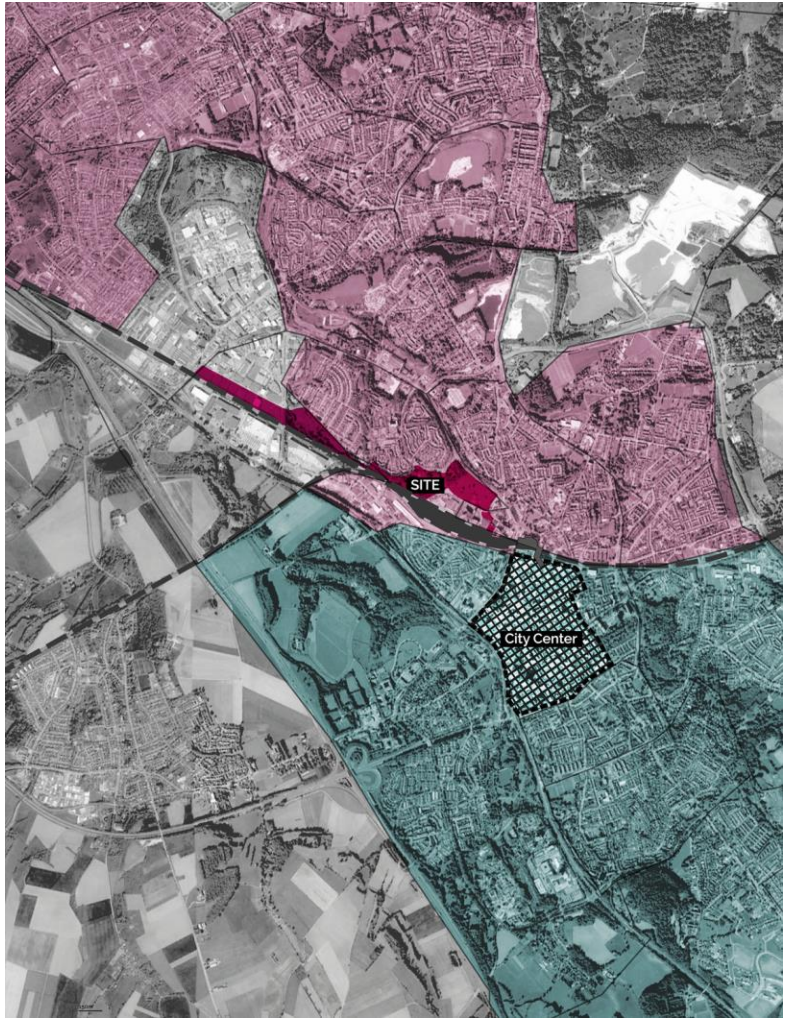






3. Stitching the two sides

North: poorer social condition
South: better, city center



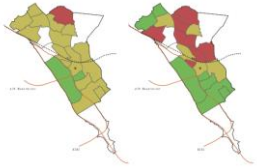


Fig. 9 | social cohesion & nuisance (Boogaard,2016)



Fig. 8 | overall housing quality & urban decay (Boogaard, 2016)



Fig. 11 | feelings of insecurity & victimization (Boogaard,2016)

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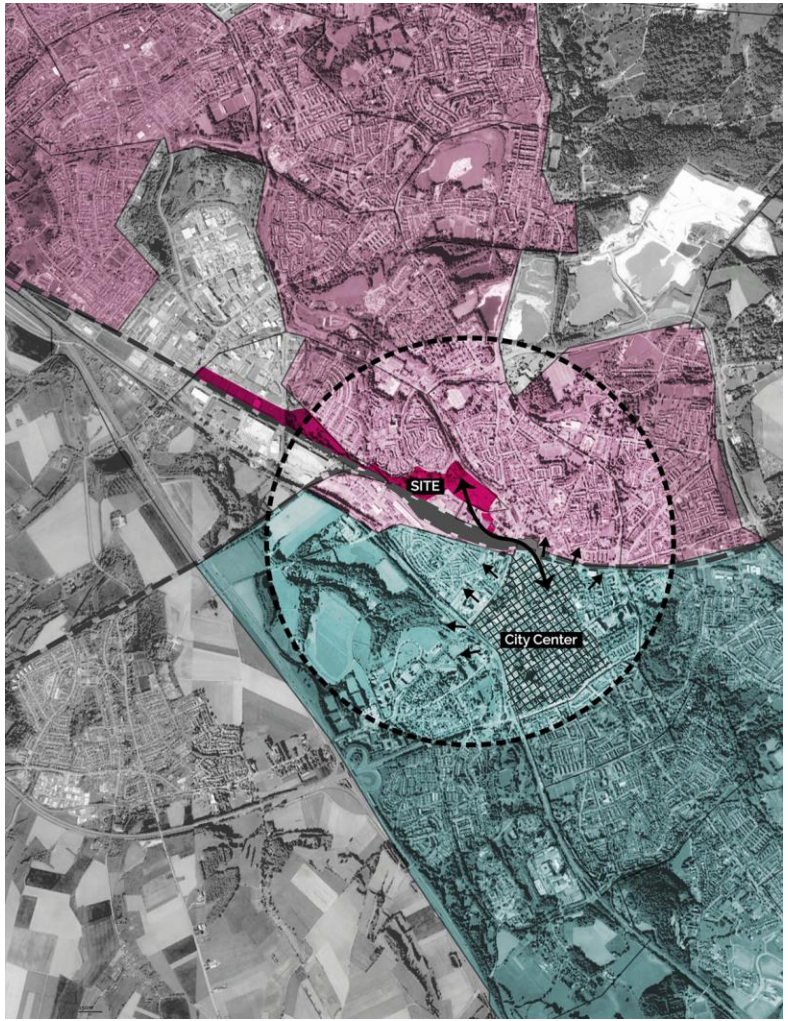


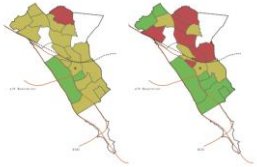


Fig. 9 | social cohesion & nuisance (Boogaard,2016)



Fig. 8 | overall housing quality & urban decay (Boogaard, 2016)



Fig. 11 | feelings of insecurity & victimization (Boogaard,2016)

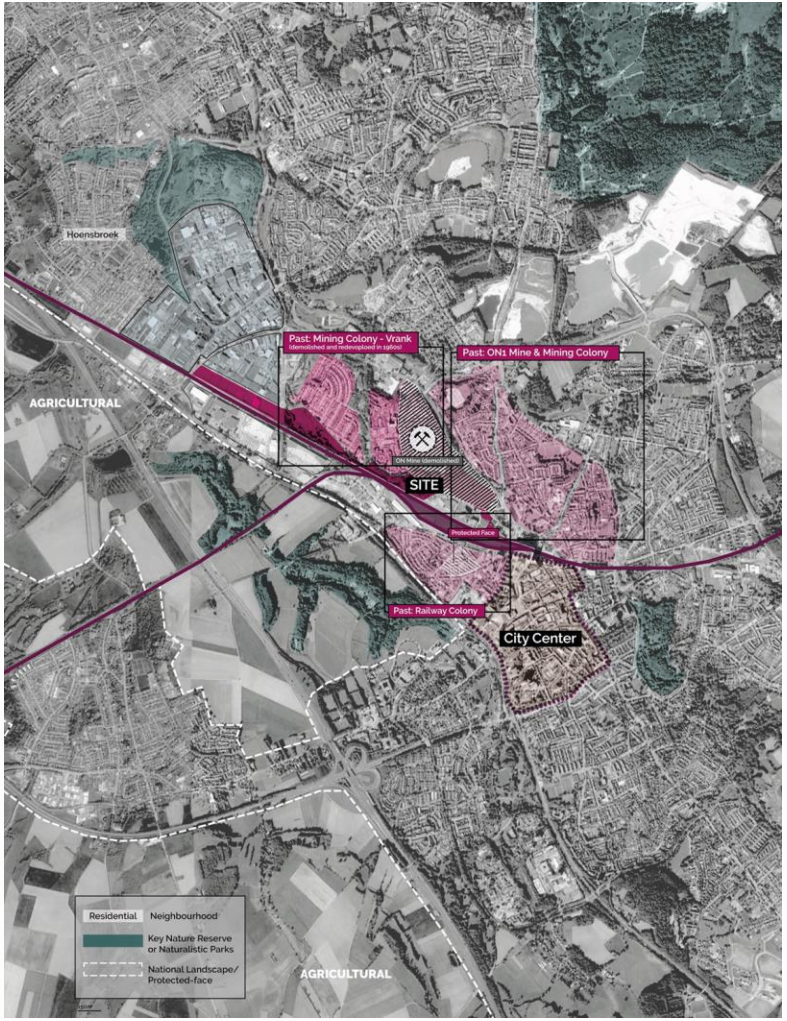
4. A renewed Social Core
for Colony-neighbourhoods



Oranje-Nassau 1 Mine



Mine museum











4. A renewed Social Core
for Colony-neighbourhoods

- Walking distance



Oranje-Nassau 1 Mine



Mine museum





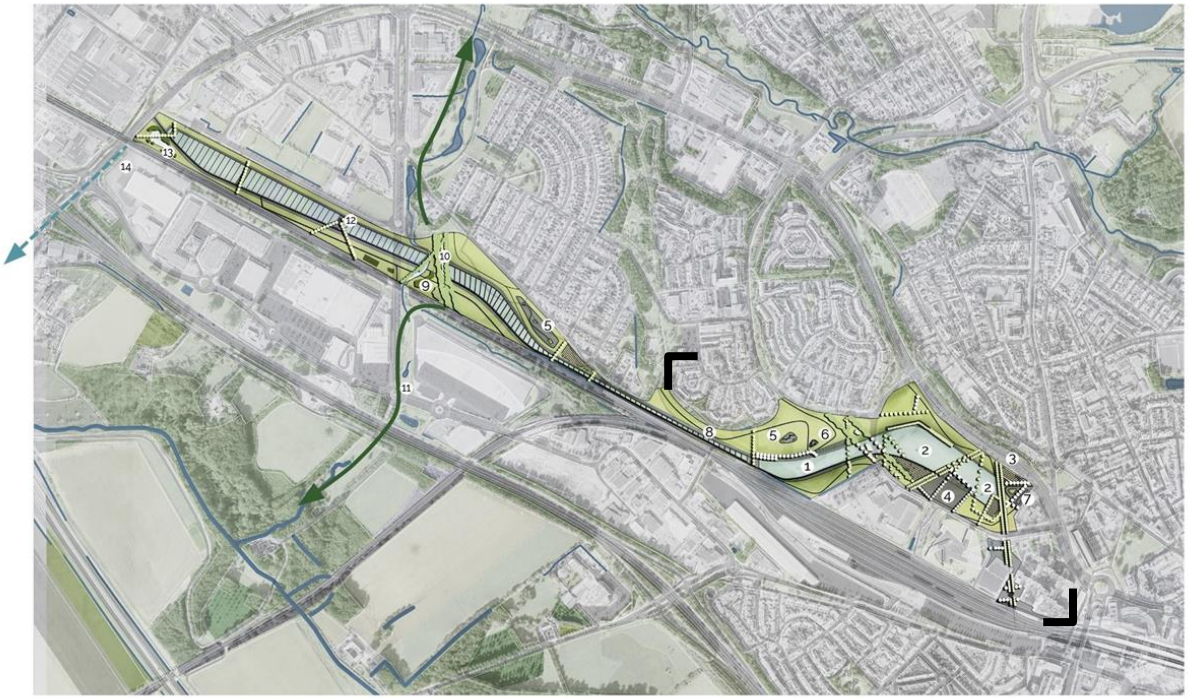






AZOLLA CITY PARK

MASTERPLAN









ANNOTATION

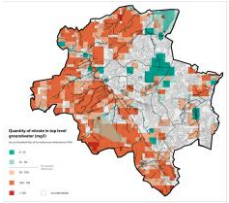
1. Grand Azolla Pond
2. 'Chimney'-fountain (Groundwater pump)
3. Urban Farming
4. Market Squar
5. Playground
6. Outdoor Gym
7. Skating Area
8. Small Azolla ponds
9. Wetland
10. Ecological Corridor
11. Existing Ecological Corridor
12. Existing Mijnwater project pump (water harvested for heating purpose)
13. Wetland
14. Discharge pipe to Geleenbeek

How does it help with the overall nitrate situation?

Diluting

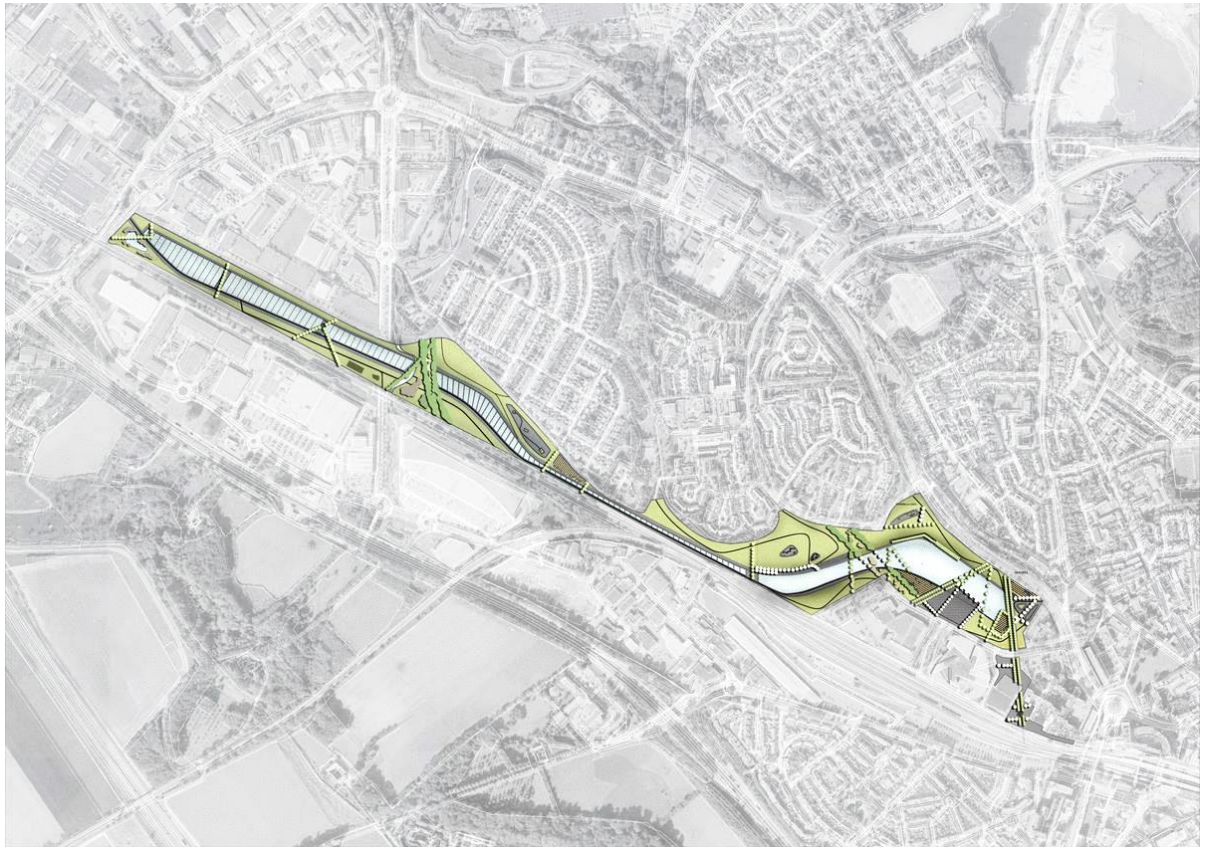
1. taking out nitrate
2. Make products out of it
3. Release cleaned water back

[repeat]





Dr. Bob Ursem



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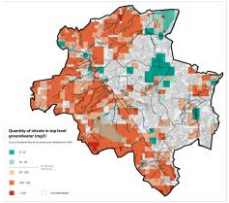

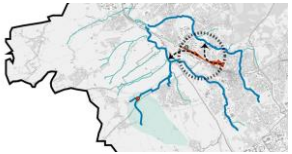



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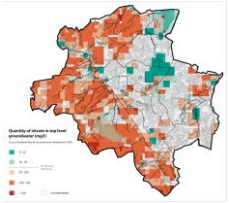



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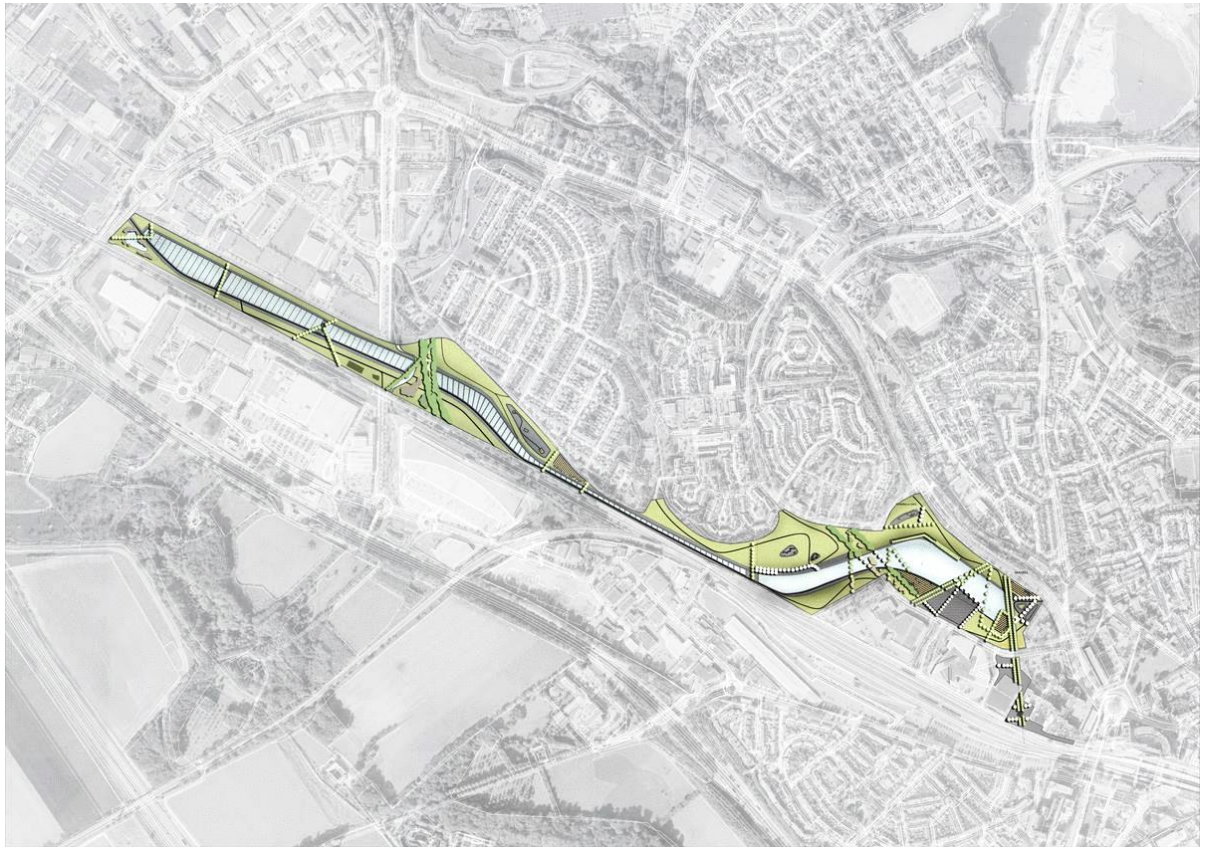
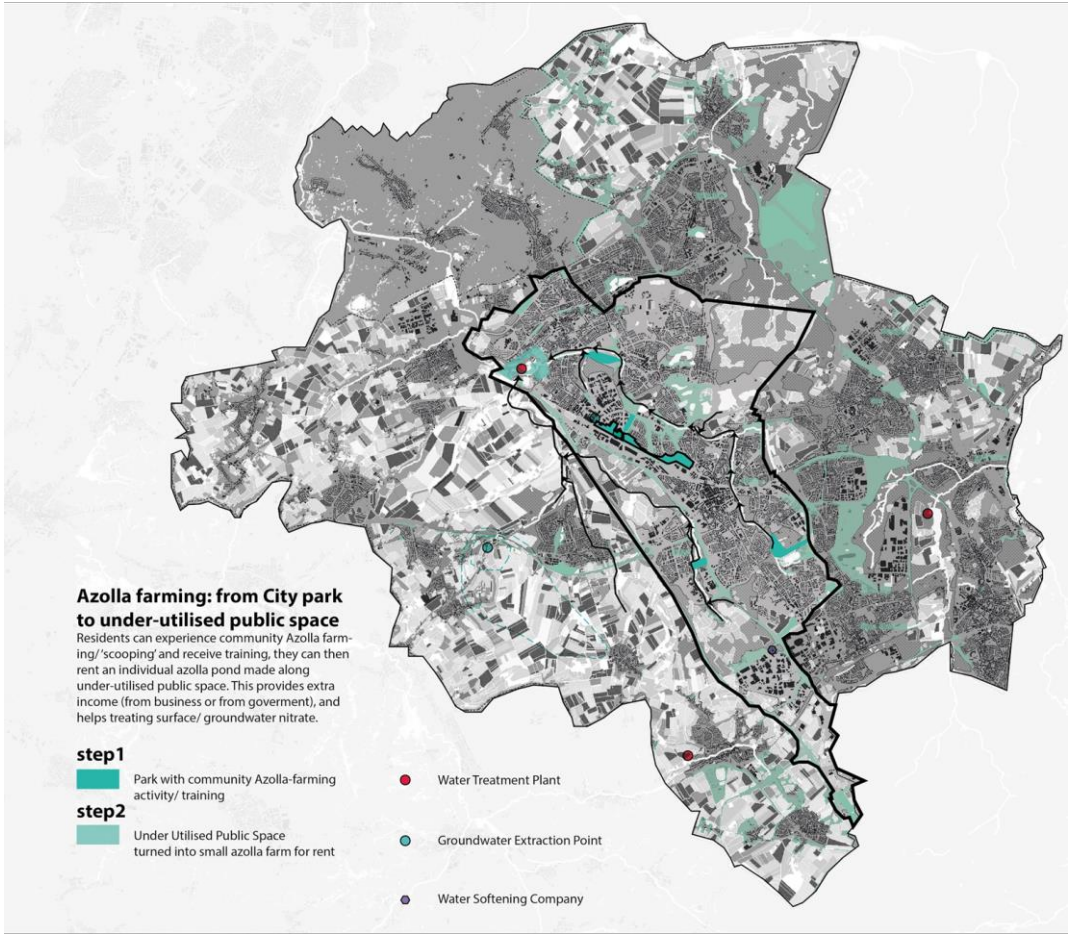
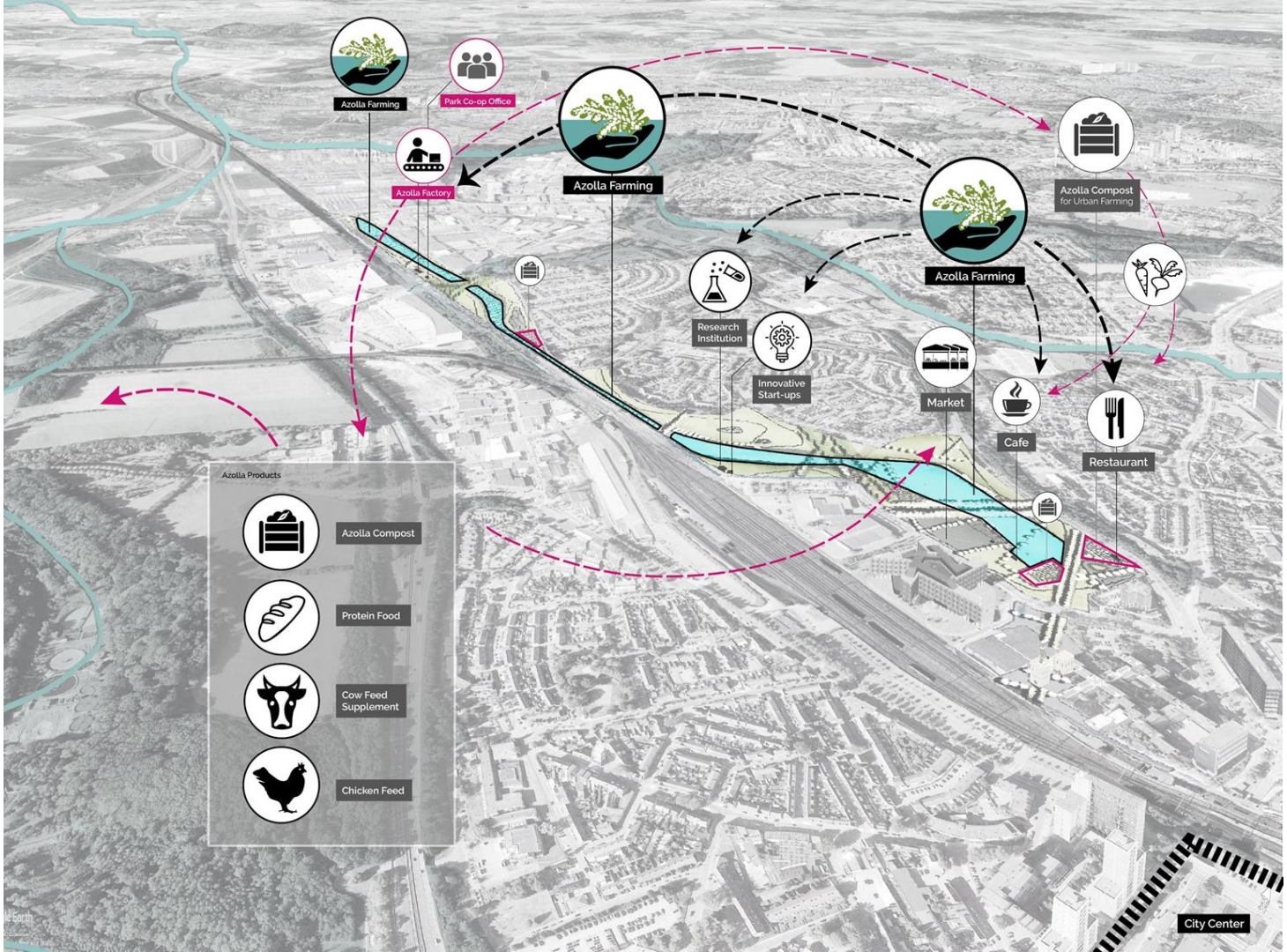


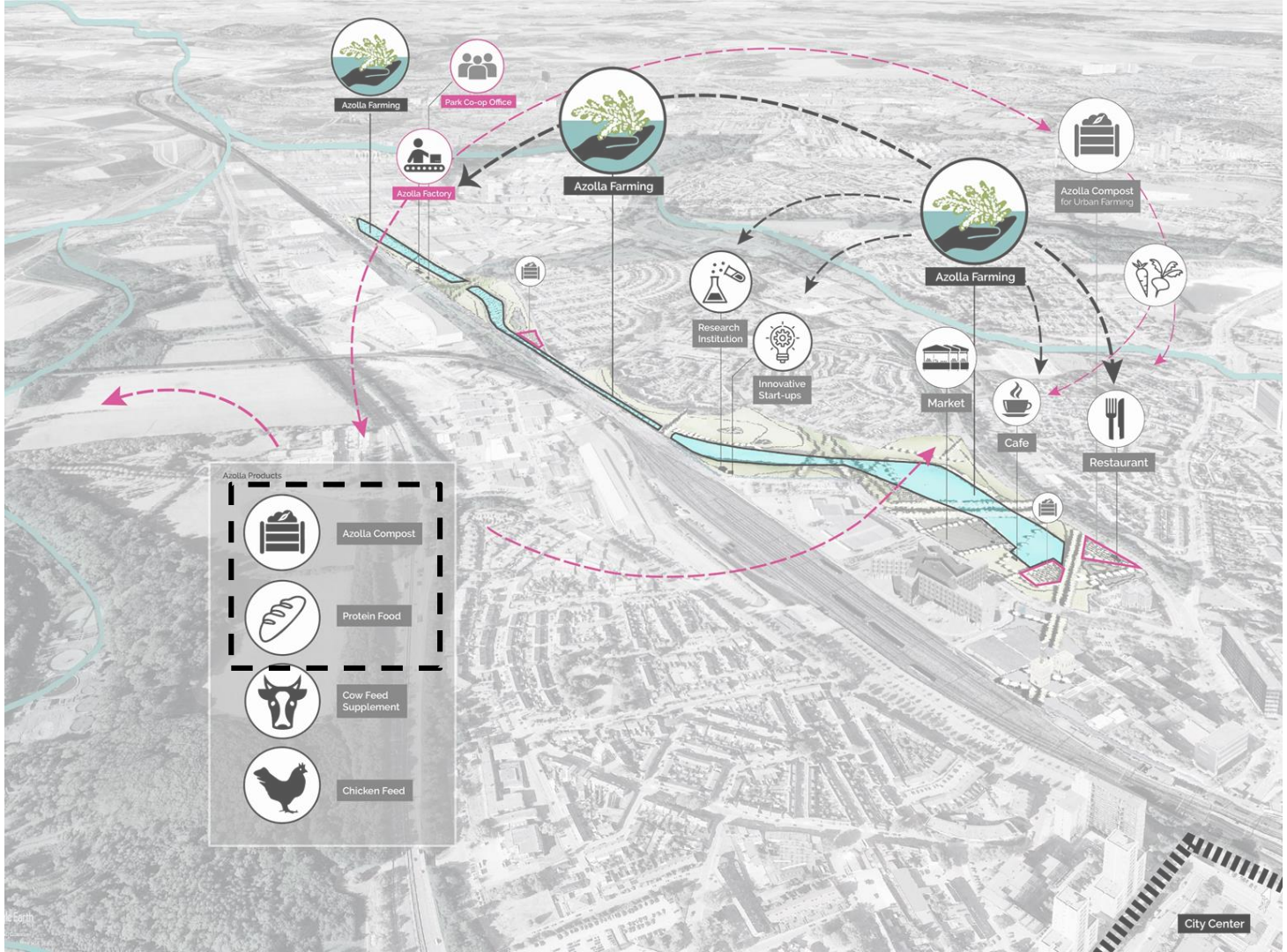
a Prototype


Azolla farming: from City park to under-utilised public space
Residents can experience community Azolla farming/'scooping' and receive training, they can then rent an individual azolla pond made along under-utilised public space. This provides extra income (from business or from goverment), and helps treating surface/ groundwater nitrate.
step1
Park with community Azolla-farming activity/ training
step2
Under Utilised Public Space turned into small azolla farm for rent
Water Treatment Plant
Groundwater Extraction Point
Water Softening Company

Azolla City Park



Azolla City Park



Azolla Food











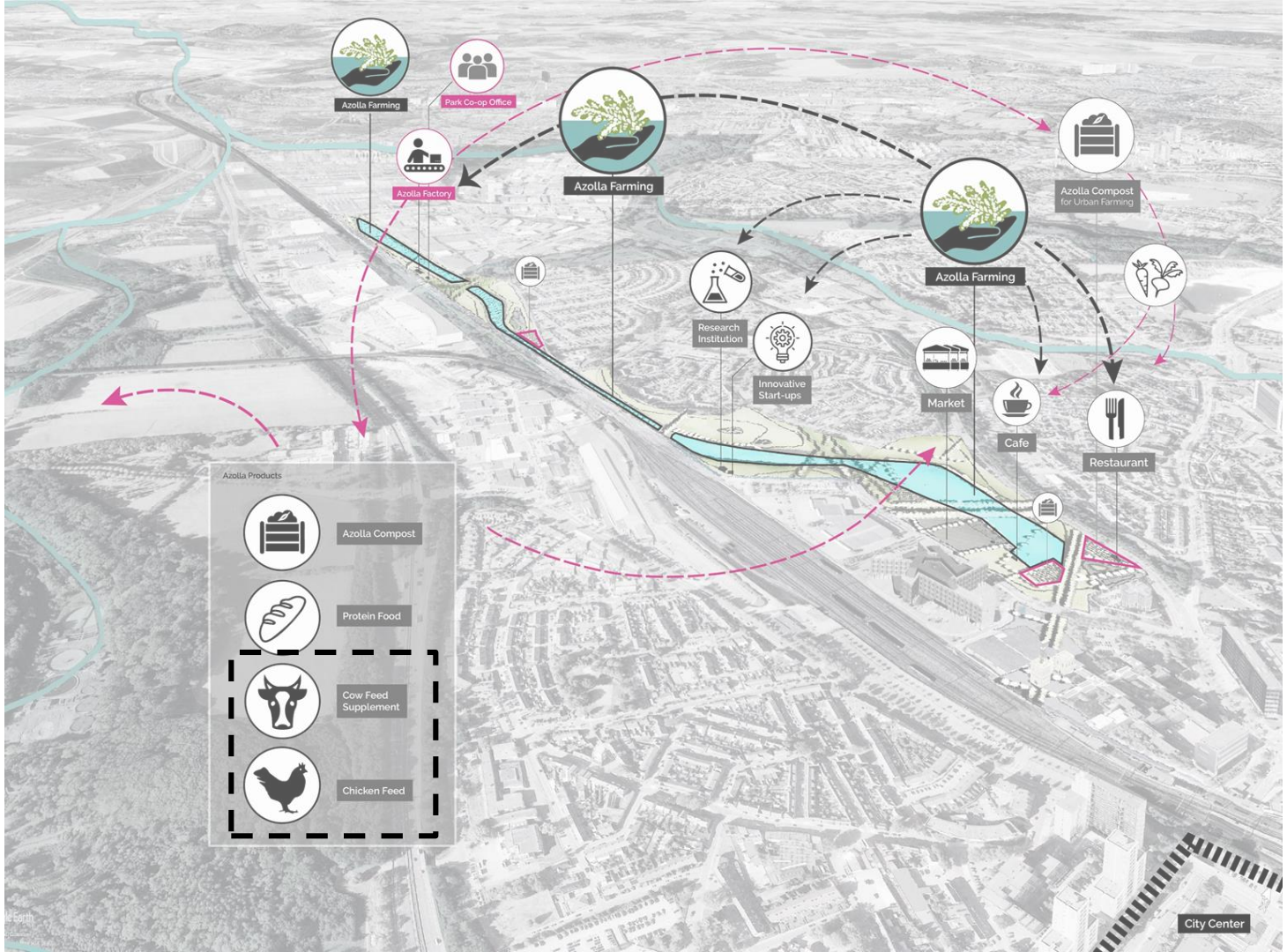
Azolla Compost for urban farming







Azolla City Park



Azolla Products: Animal Feed

Formula:
Every 1 m^2 = 0.15 to 0.5 kg (per day)

Every 1kg = 1 dairy cow supplement (per day)
9kg = 100 chicken supplement (per day)

Quantity of Site:
Total water surface: 7.15 ha (71500 m^2)

10725 kg to
35750 kg fresh azolla (per day)

- Milk yield increases 15 - 20%
- Milk quality improvement

As Supplement feed for
35750 dairy cows (per day)

- Egg quality increase
- Egg quantity improvement

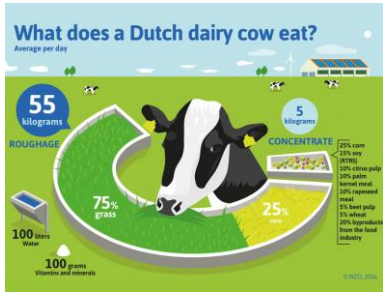
As Supplement feed for
400000 chicken (per day)

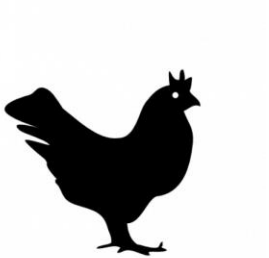
"An area of 4-4.5 m^2 and 10-15 cm deep can produce about 2 kg/d of fresh azolla, enough to supplement 2 dairy cows." (per day)

https://www.feedipedia.org/node/565#:~:text=An%20area%20of%204%2D4.5,to%20supplement%202%20dairy%20cows.

'A poultry farm with 100 birds will require about 9 kg of fresh Azolla/day to replace 20% of the commercial feed'
(Subudhi & Singh, 1978)

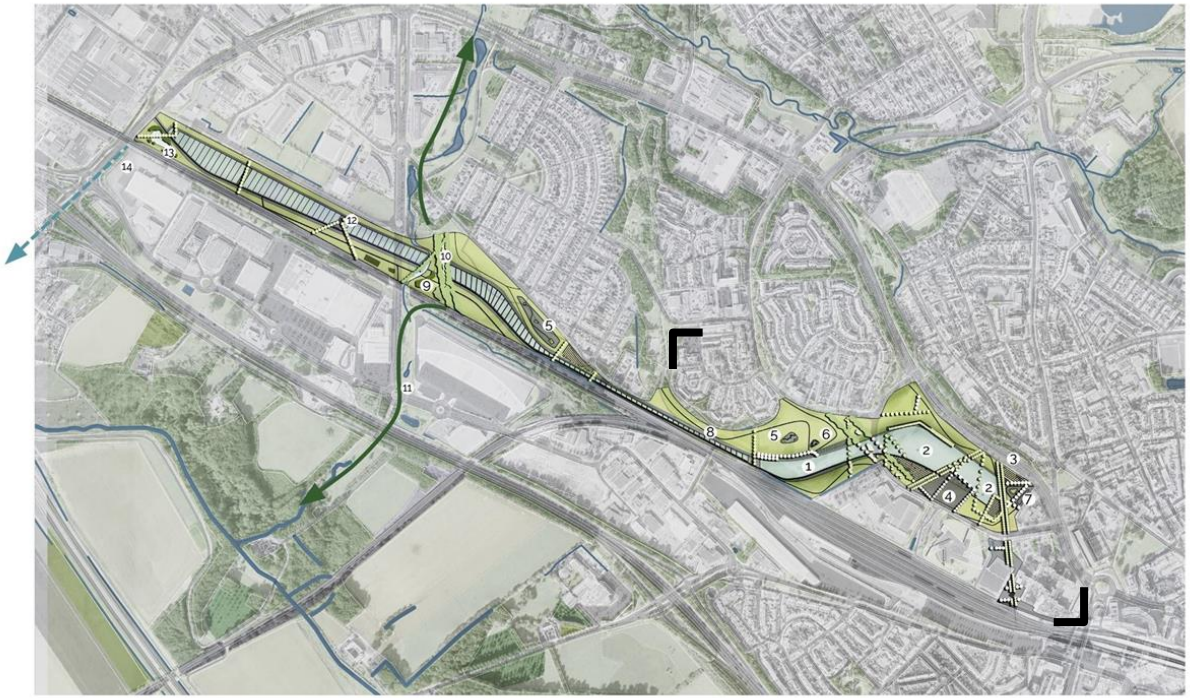
Subudhi, B & Singh, P. 1978. Nutritive value of the water fern Azolla pinnata for chicks. Poultry Science, vol. 57, pp. 123-124.





AZOLLA CITY PARK

MASTERPLAN









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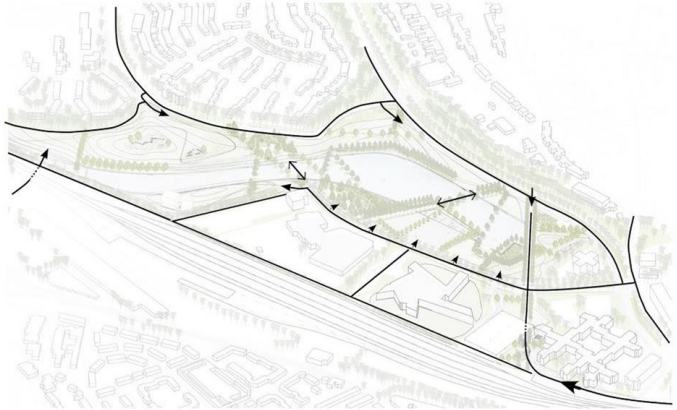
14. Discharge pipe to Geleenbeek

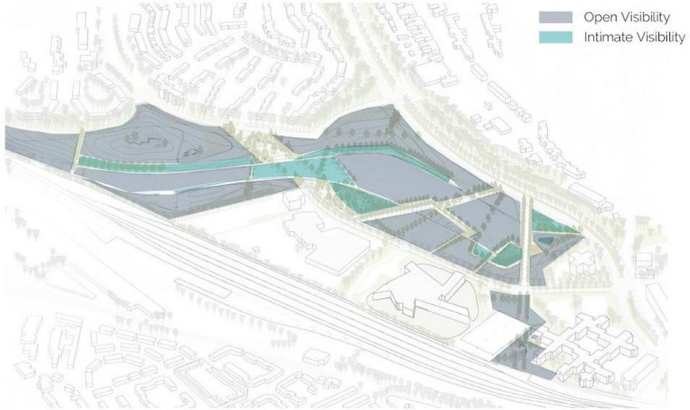

4.4.1 AZOLLA CITY PARK
PLAN DRAWING
CBS building
120
121

Design Analysis

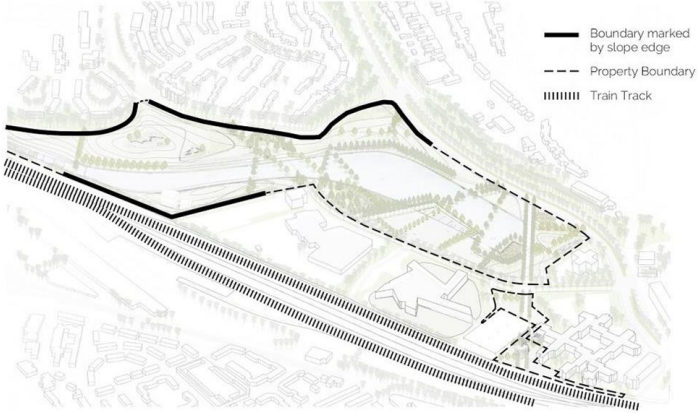
Connection/ Accessibility



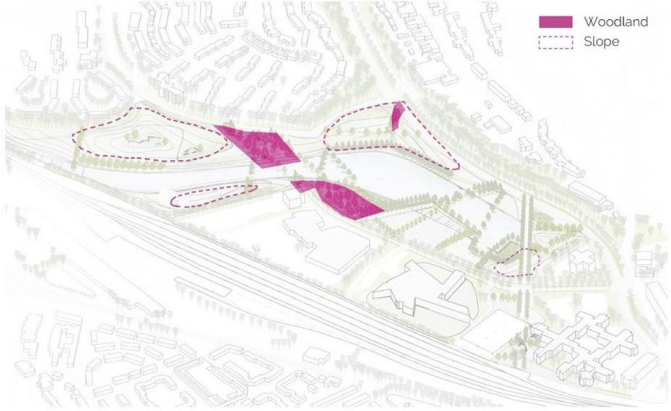
Visibility



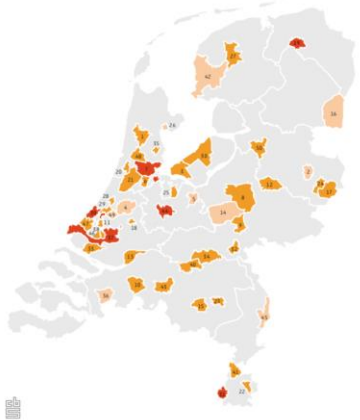
Types of Boundary/ Edge



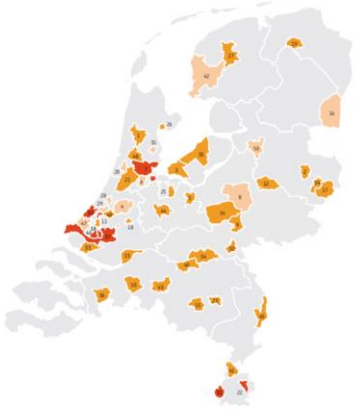
Nature-escape + Slope



1.11 Crime victim rates in municipalities with over 70 thousand inhabitants, 2015



1.12 Perceived neighbourhood unsafety in municipalities with over 70 thousand inhabitants, 2015



compared to average of municipalities with over 70 thousand inhabitants

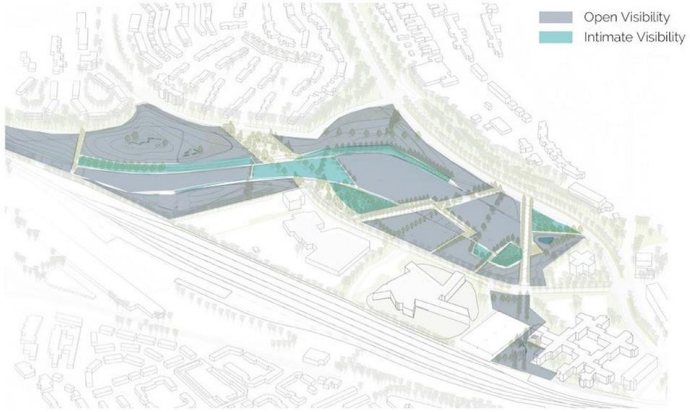
Lower than average | Average | Higher than average

1. Alkmaar, 2. Almelo, 3. Almere, 4. Alphen aan den Rijn, 5. Amersfoort, 6. Amstelveen, 7. Amsterdam, 8. Apeldoorn, 9. Arnhem, 10. Breda, 11. Delft, 12. Deventer, 13. Dordrecht, 14. Ede, 15. Eindhoven, 16. Emmen, 17. Enschede, 18. Gouda, 19. Groningen, 20. Haarlem, 21. Haarlemmermeer, 22. Heerlen, 23. Helmond, 24. Hengelo, 25. Hilversum, 26. Hoorn, 27. Leeuwarden, 28. Leiden, 29. Leidschendam-Voorburg, 30. Lelystad, 31. Maastricht, 32. Nijmegen, 33. Nissewaard, 34. Oss, 35. Purmerend, 36. Roosendaal, 37. Rotterdam, 38. Schiedam, 39. The Hague, 40. 's-Hertogenbosch, 41 Sittard-Geleen, 42 Südwest Fryslân, 43. Tilburg, 44. Utrecht, 45. Venlo, 46. Vlaardingen, 47. Westland, 48. Zaanstad, 49. Zoetermeer, 50. Zwolle

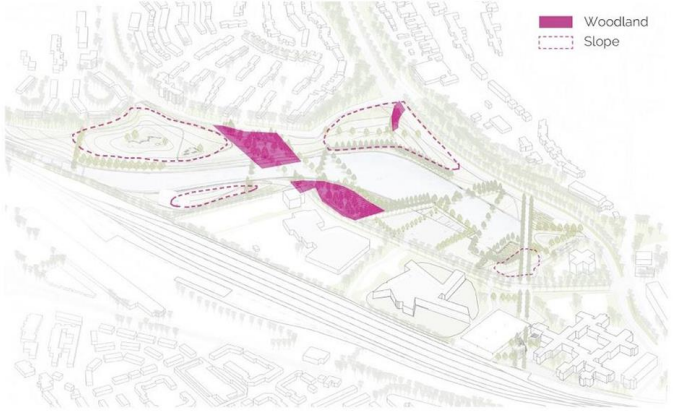
Perceived Safety

Heerlen is the only region where perceived 'unsafety' is lower than its actual 'unsafety'.

Visibility



Nature-escape + Slope



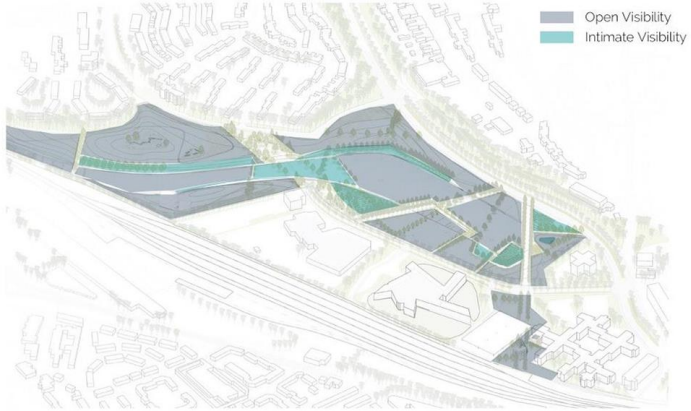
on the optimal level of complexity and order.

	UNDERSTANDING	EXPLORATION
Immediate	**Coherence** Organization – Ease in which the environment can be read or understood	**Complexity** Richness – Variety of objects [*rather than the number of objects*]
Inferred	**Legibility** Wayfinding – Ease of understanding orientation	**Mystery**[5] Sustained interest – Potential for more information

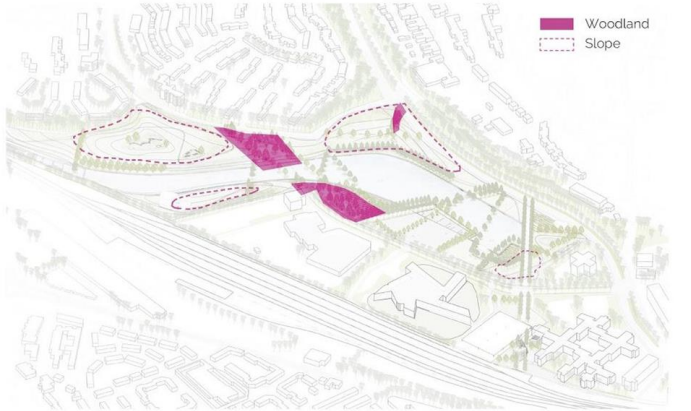
Table 2: **Kaplan & Kaplan Preference Matrix Model**
Excerpted from Kaplan [25]

Environmental Psychology Model

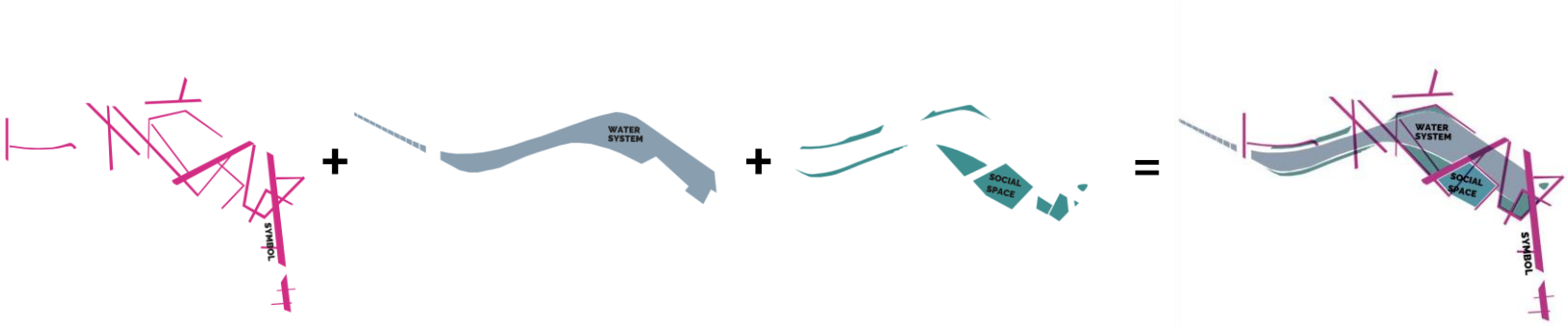
Visibility



Nature-escape + Slope



Spatial Design



Historical Pattern

Azolla-Water System

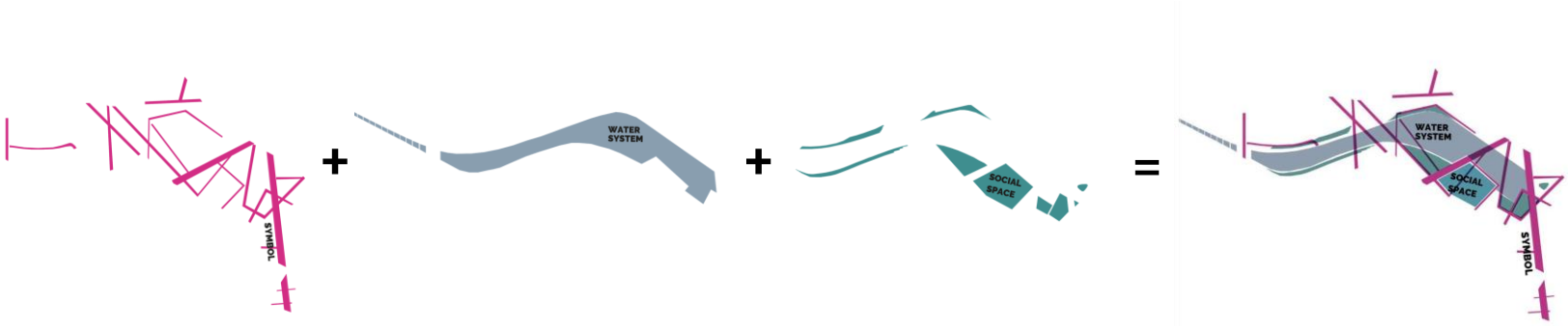
Social Space

Azolla City Park



Juxtaposition of time

Spatial Design



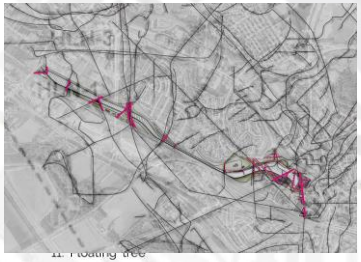
Historical Pattern

Azolla-Water System

Social Space

Azolla City Park

4.4.1 AZOLLA CITY PARK
PLAN DRAWING



12. Visitor Center
13. Market Square
14. Narrow Forest/ woodland
15. 'Tunnel' Gallery
16. Seating Steps
17. Labs + Start-ups
18. Outdoor Gym
19. Playground
20.Small Azolla ponds

11. Floating tree

122

123

Tree lines tell story

Juxtaposition of time





Tree lines tell story

Juxtaposition of time



















Mine Tunnel Timber. Source: http://sleutelspoor.nl/projecten/mijnhout/



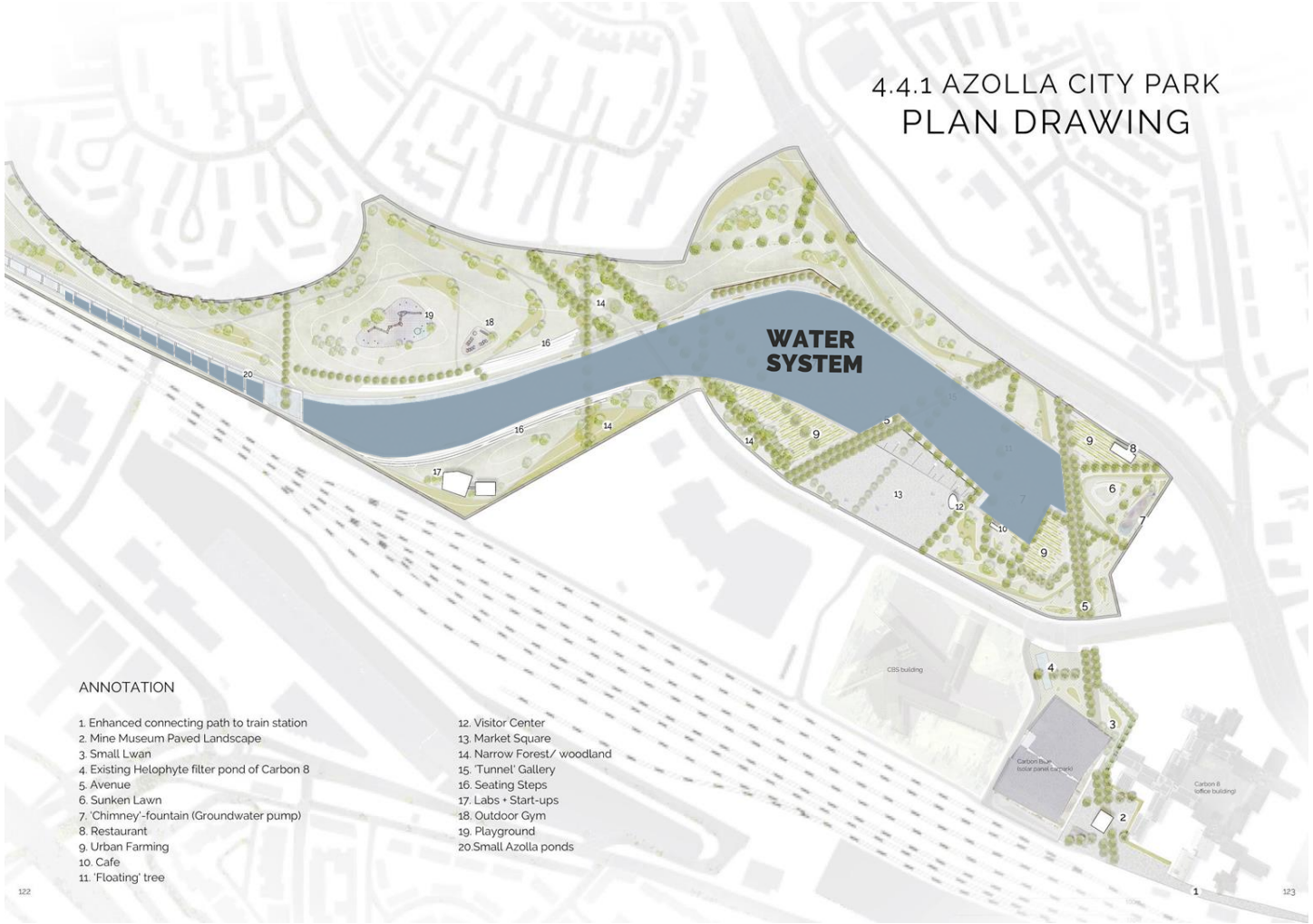
Mine Tunnel Timber. Source: http://www.timberiq.co.za/

Tree lines tell story

Juxtaposition of time



4.4.1 AZOLLA CITY PARK
PLAN DRAWING



ANNOTATION

1. Enhanced connecting path to train station
2. Mine Museum Paved Landscape
3. Small Lwan
4. Existing Helophyte filter pond of Carbon 8
5. Avenue
6. Sunken Lawn
7. 'Chimney'-fountain (Groundwater pump)
8. Restaurant
9. Urban Farming
10. Cafe
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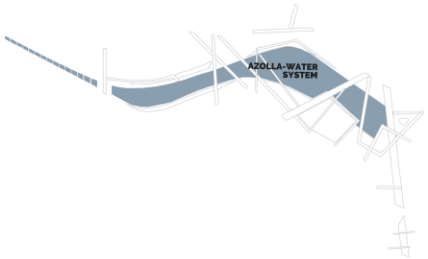
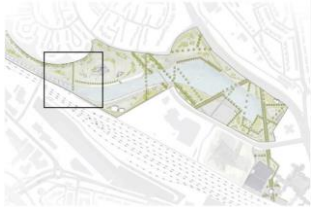
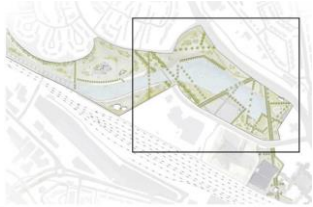


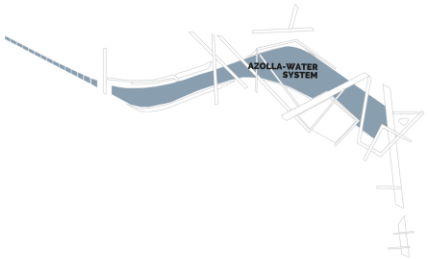




Azolla Ponds/
Water Features







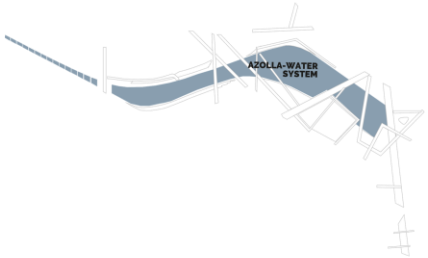
BIG AZOLLA POND

Main Park Entrance - Gathering Hub with cafe, market, restaurant, skating area and gallery



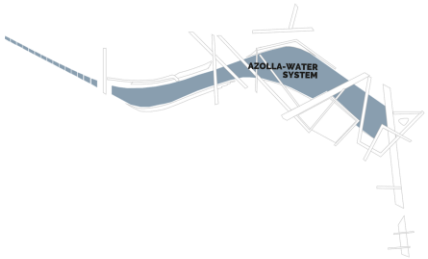






BIG AZOLLA POND





Long Perspective Section - Big Azolla Pond



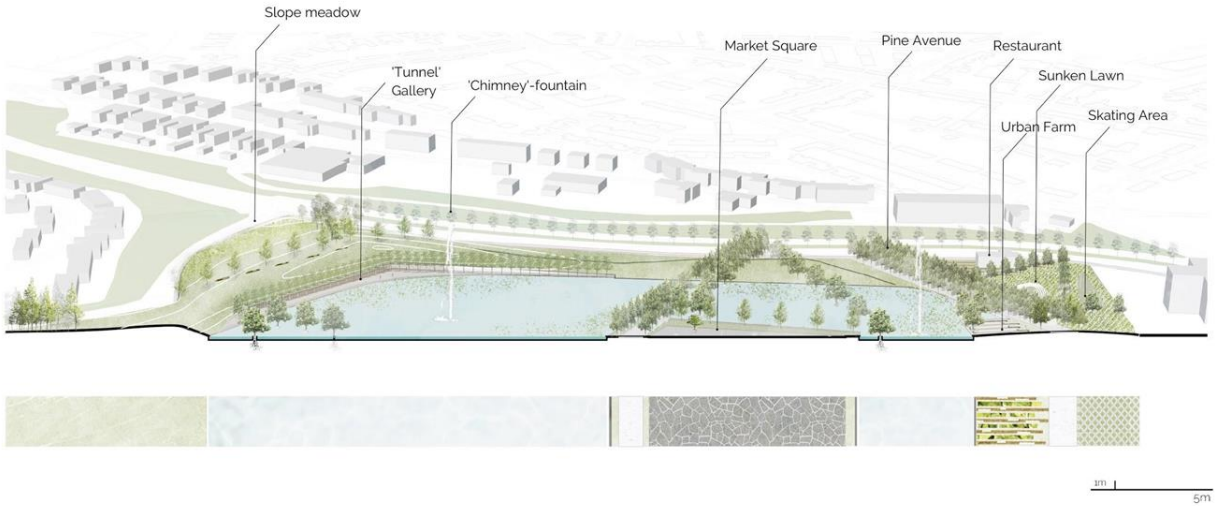


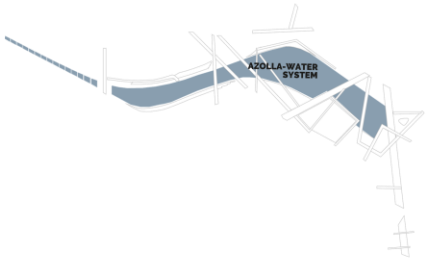




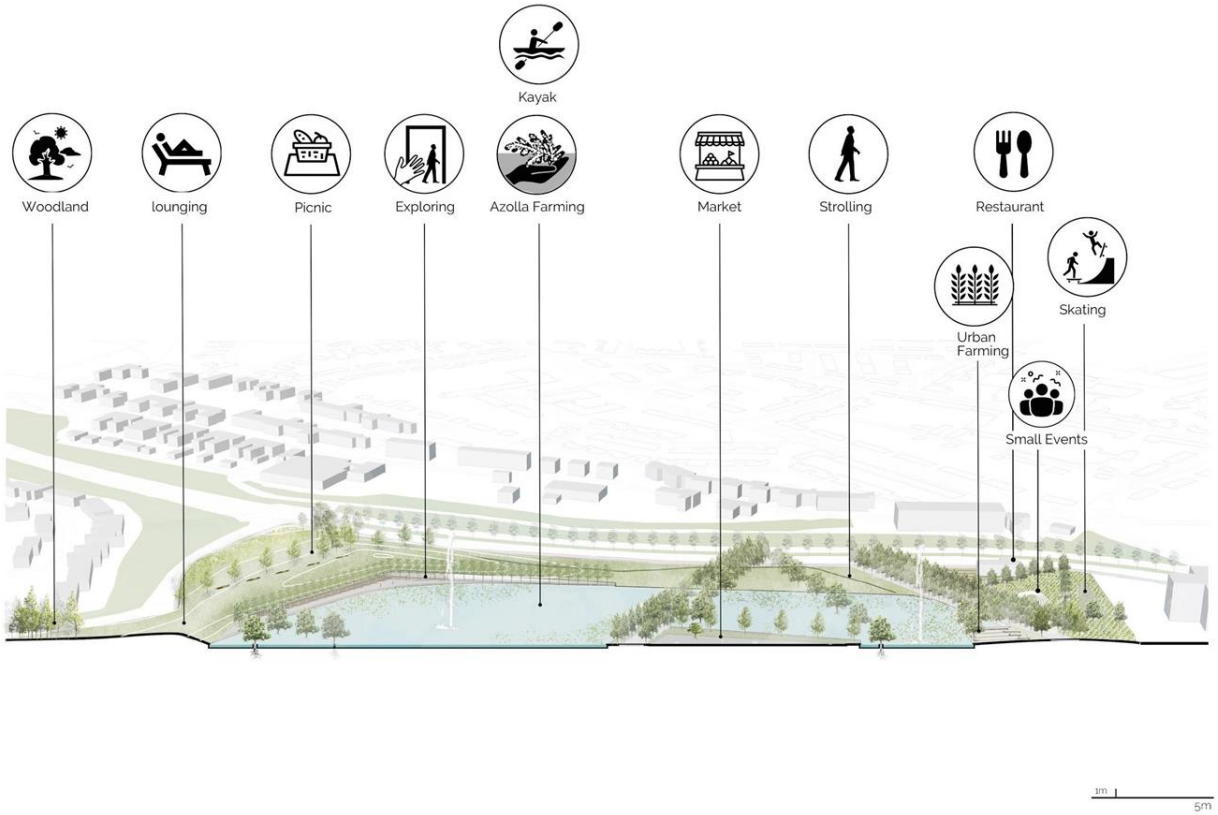


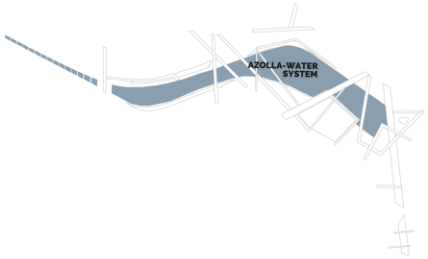
Section AA'



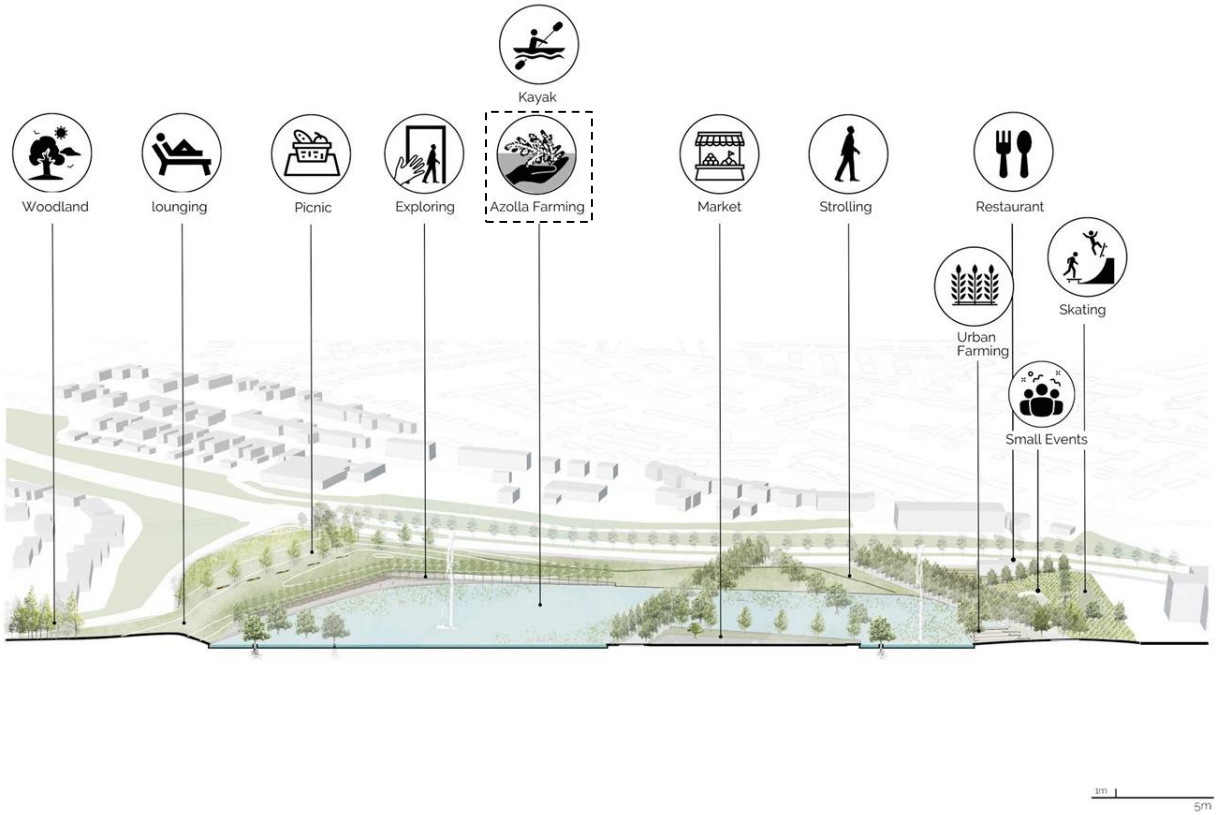


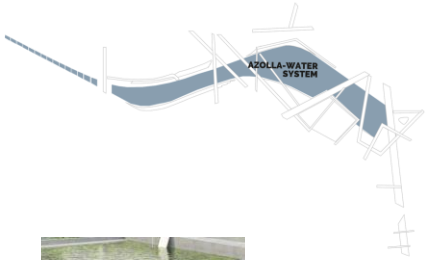
Long Perspective Section - Big Azolla Pond





Long Perspective Section - Big Azolla Pond

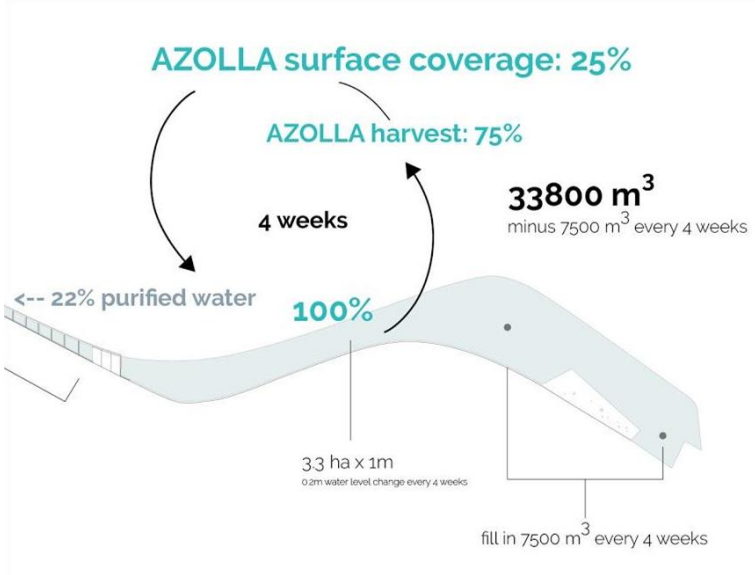




Azolla Farming



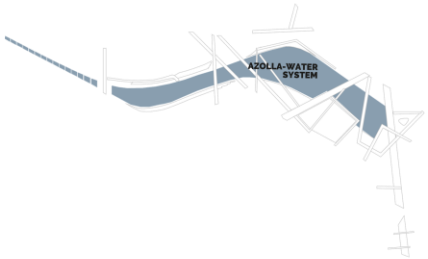
Monthly or Daily Harvest







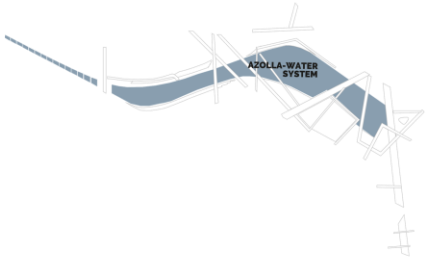




SMALL AZOLLA POND







SMALL AZOLLA POND

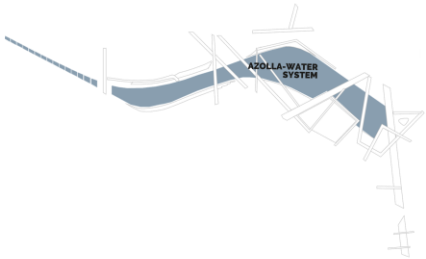






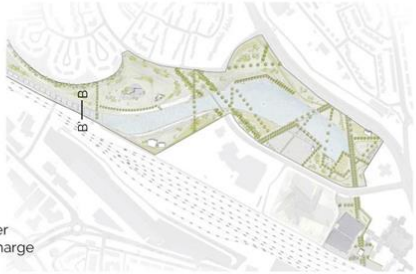


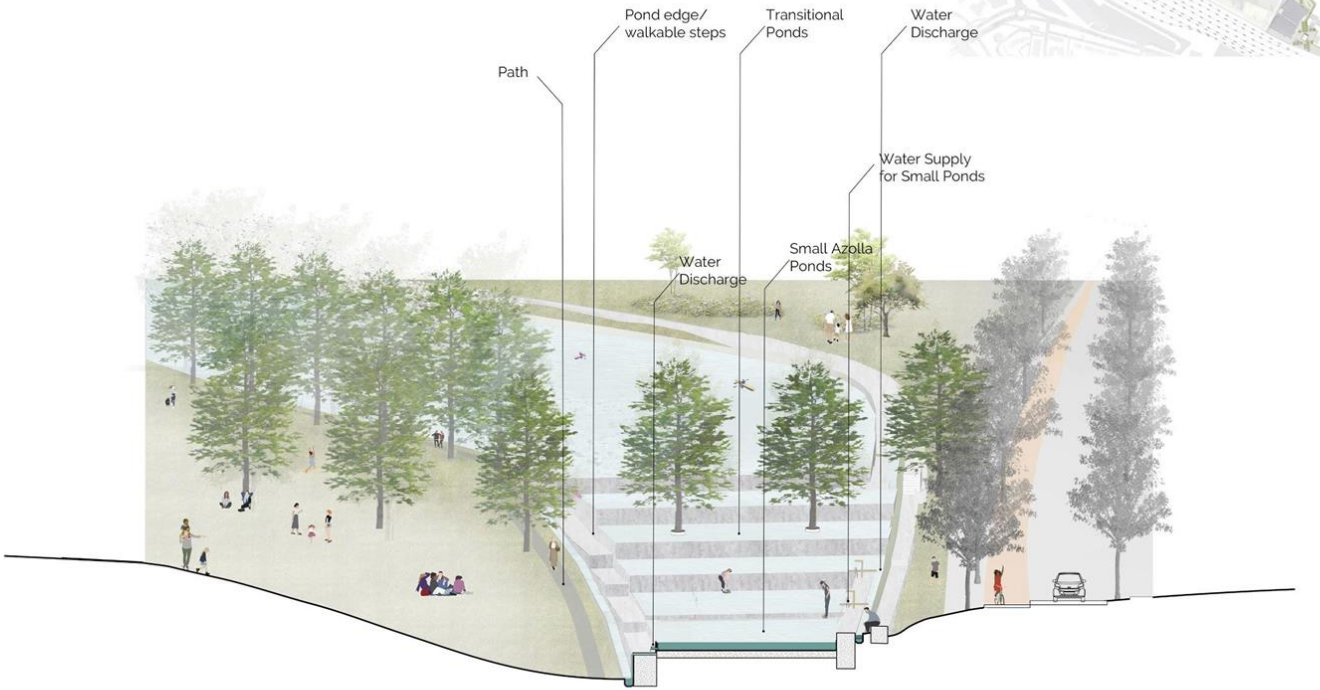


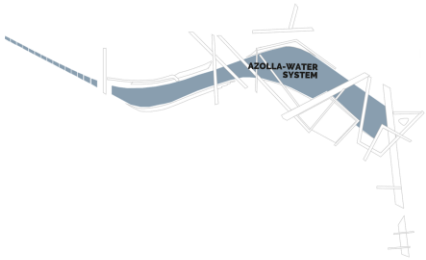


Perspective Section - Small Azolla Pond System

Section BB'

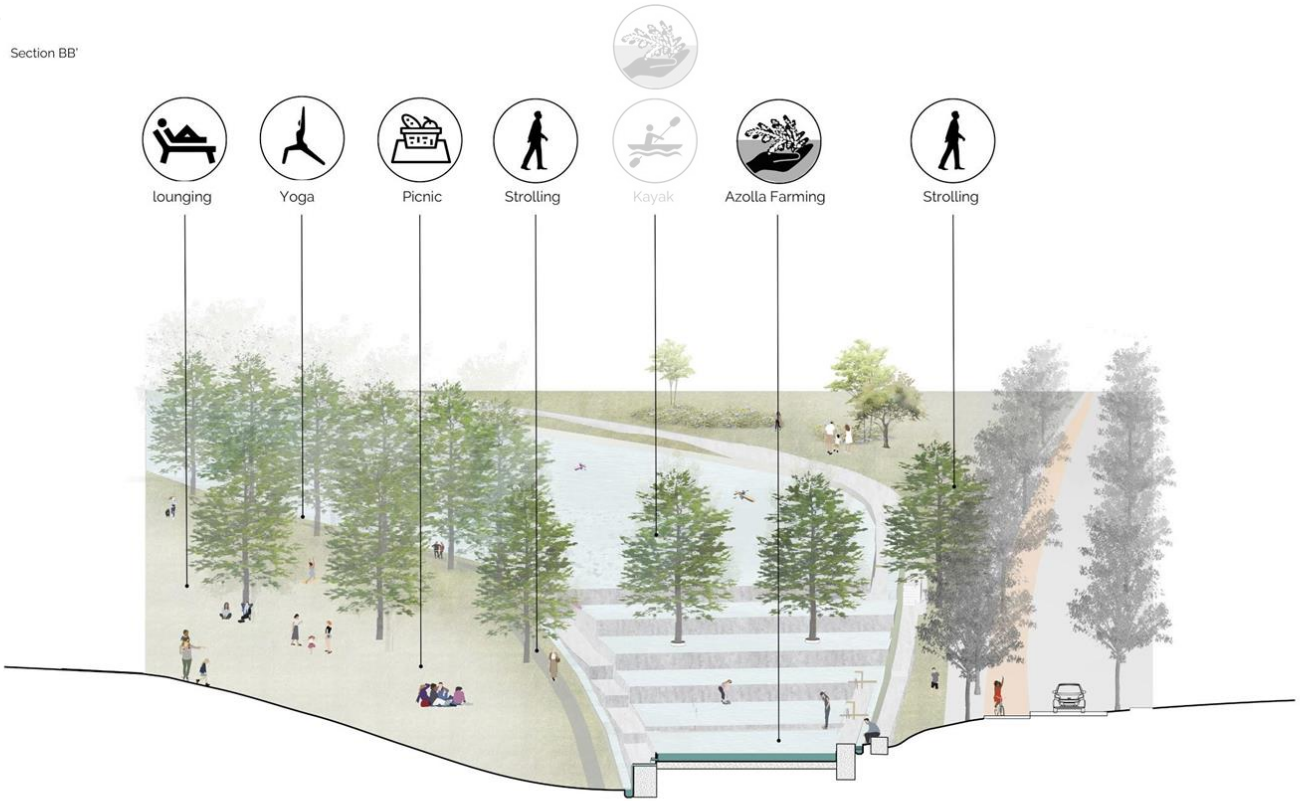






Perspective Section - Small Azolla Pond System (Programme)

Section BB'

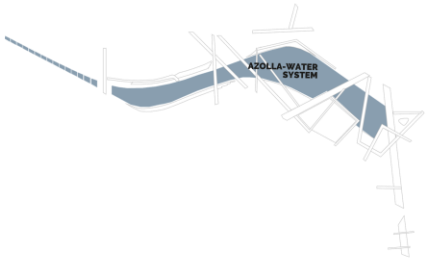












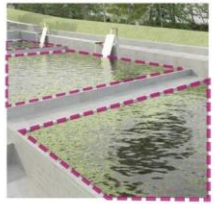
Azolla Pond:
(Lake)



Micro Water
Discharge:



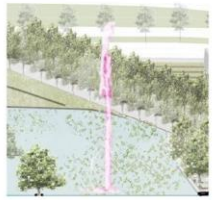
Azolla Pond:
(Small Ponds)



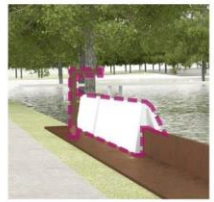
Main Water
Discharge:



Groundwater
Pump:



Micro Water-
Circulation Device:

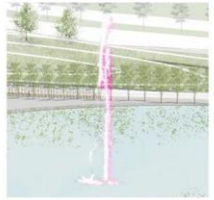


Version 1



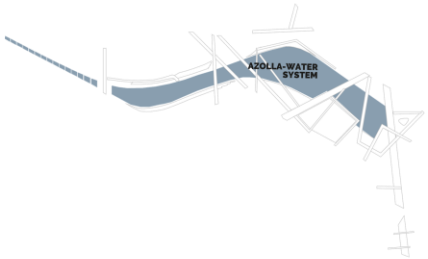
Monthly Groundwater fountain
symbolises lost landmark





Version 2





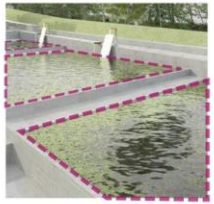
Azolla Pond:
(Lake)



Micro Water
Discharge:



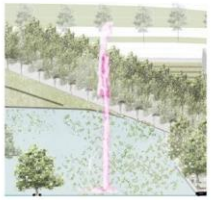
Azolla Pond:
(Small Ponds)



Main Water
Discharge:



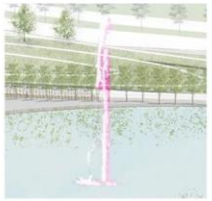
Groundwater
Pump:





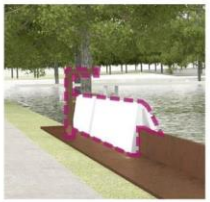
Monthly Groundwater fountain
symbolises lost landmark





Micro Water-
Circulation Device:

Version 1

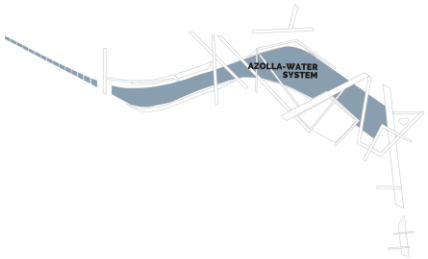


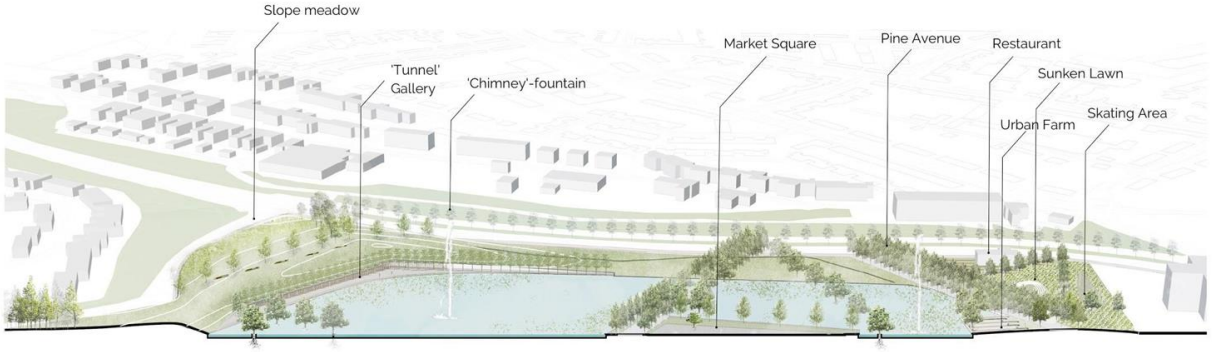
Version 2













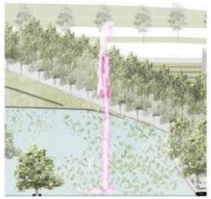


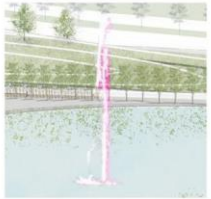
Groundwater Pump:

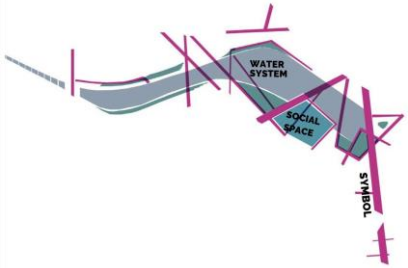


Monthly Groundwater fountain symbolises lost landmark









Spatial Experience of different users

4.4.1 AZOLLA CITY PARK
PLAN DRAWING

ANNOTATION

1. Enhanced connecting path to train station
2. Mine Museum Paved Landscape
3. Small Lwan
4. Existing Helophyte filter pond of Carbon 8
5. Avenue
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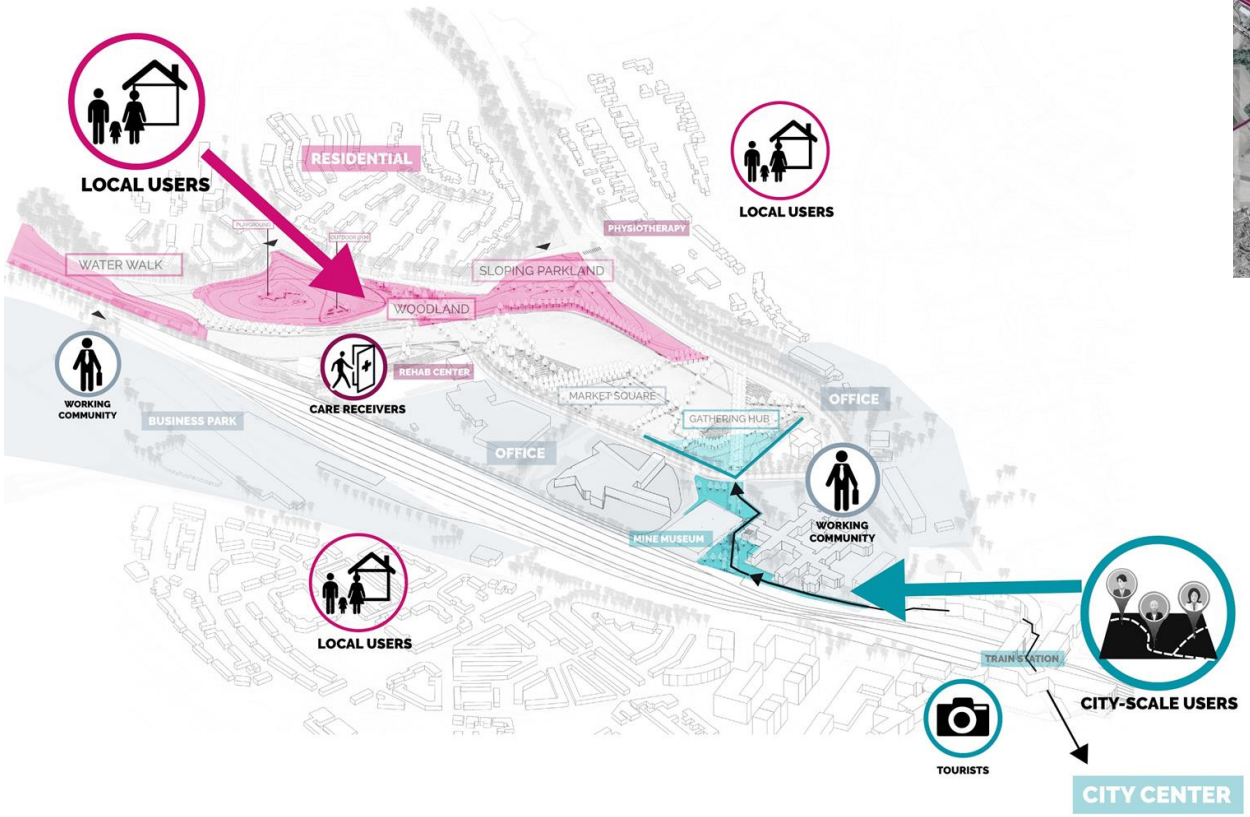
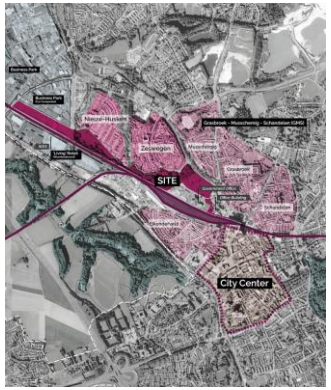
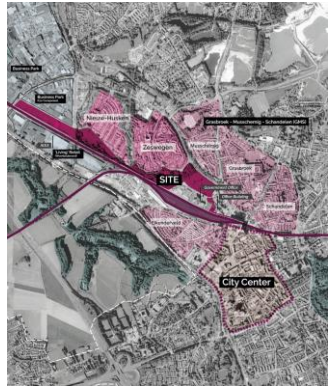
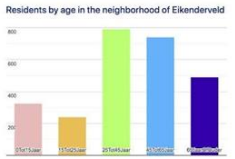

LOCAL USERS
RESIDENTIAL
WATER WALK
WOODLAND
SLOPING PARKLAND
PHYSIOTHERAPY
LOCAL USERS
WORKING COMMUNITY
BUSINESS PARK
REHAB CENTER
CARE RECEIVERS
MARKET SQUARE
GATHERING HUB
OFFICE
OFFICE
WORKING COMMUNITY
MINE MUSEUM
LOCAL USERS
TRAIN STATION
CITY-SCALE USERS
TOURISTS
CITY CENTER


SITE
City Center

- **Low-income**
- **High unemployment**



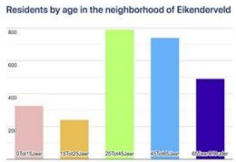
Zeswegen



Average income per inhabitant:

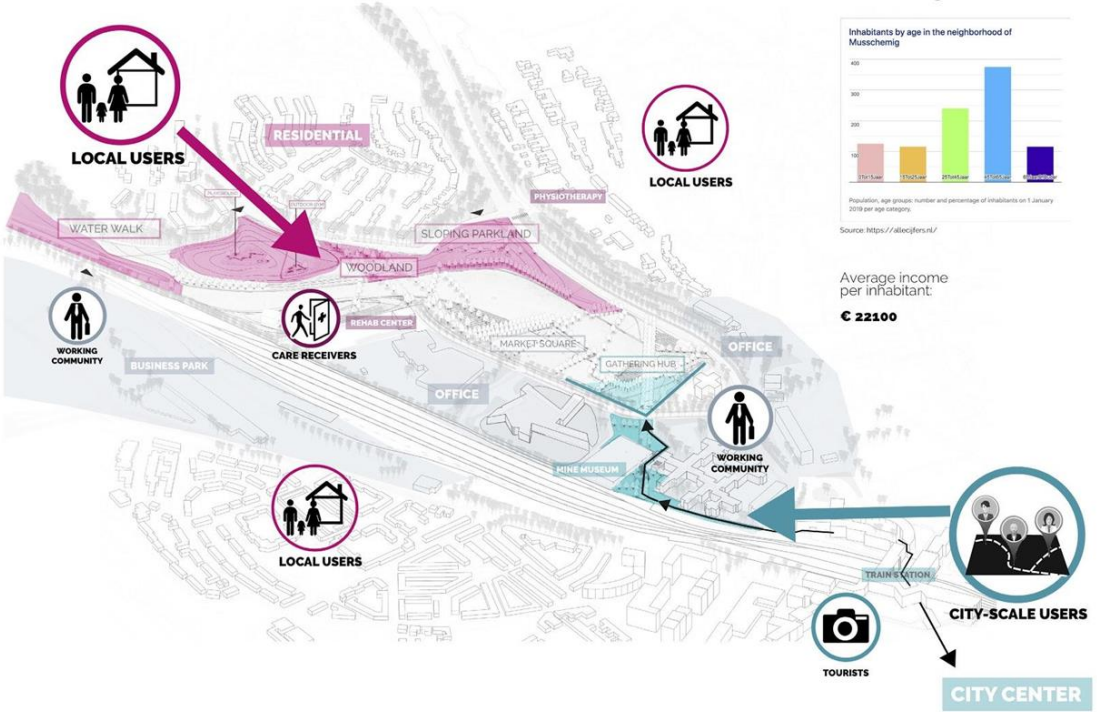
€ 16400

Eikenderveid



Average income per inhabitant:

€ 20800

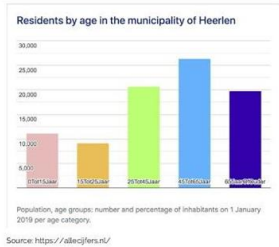


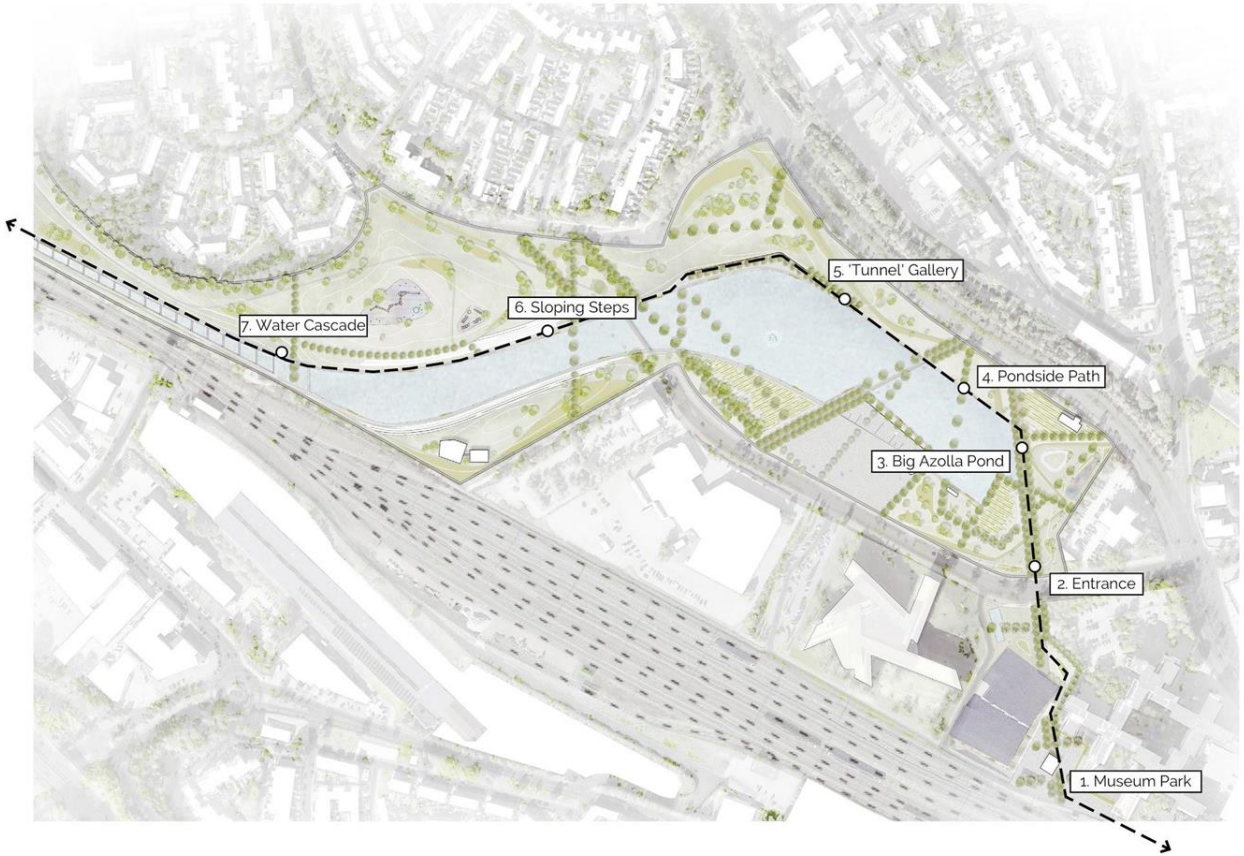
Musschemig

Average income per inhabitant:

€ 22100

Heerlen





CITY-SCALE USERS

EXAMPLE ROUTE 1

City-scale user Water-Walk Route

MUSEUM PARK

Open space outside of the existing Mine Museum acts as important connector between the train station and the main park area















Impression Collage

ENTRANCE - PINE AVENUE

Existing topography creates inviting scenic slope effect







ENTRANCE - PINE AVENUE

Existing topography creates inviting scenic slope effect







Temporal Change - Growth (30 - 50 years)

BIG AZOLLA POND

with scenic view of Azolla pond and 'floating' trees



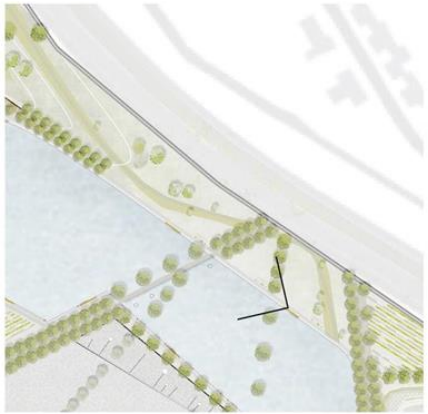




PONDSIDE PATH

a continuous path along the azolla pond



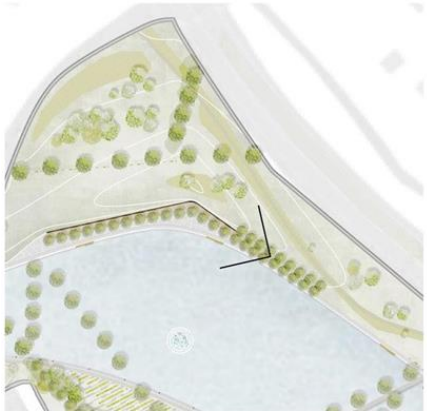




‘TUNNEL’ GALLERY

a gallery carved into the exisiting slope, offering a semi-enclosed spatial expereince. The Gallery showcased a more literal tunnel metaphor





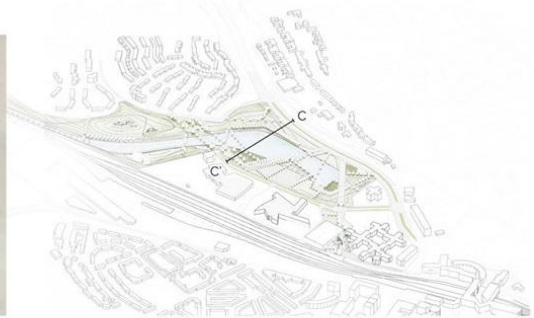


‘TUNNEL’ GALLERY

a gallery carved into exisiting slope; acts as a semi-enclosed spatial expereince. The Gallery showcased a more literal tunnel metaphor

‘tunnel’ gallery Section



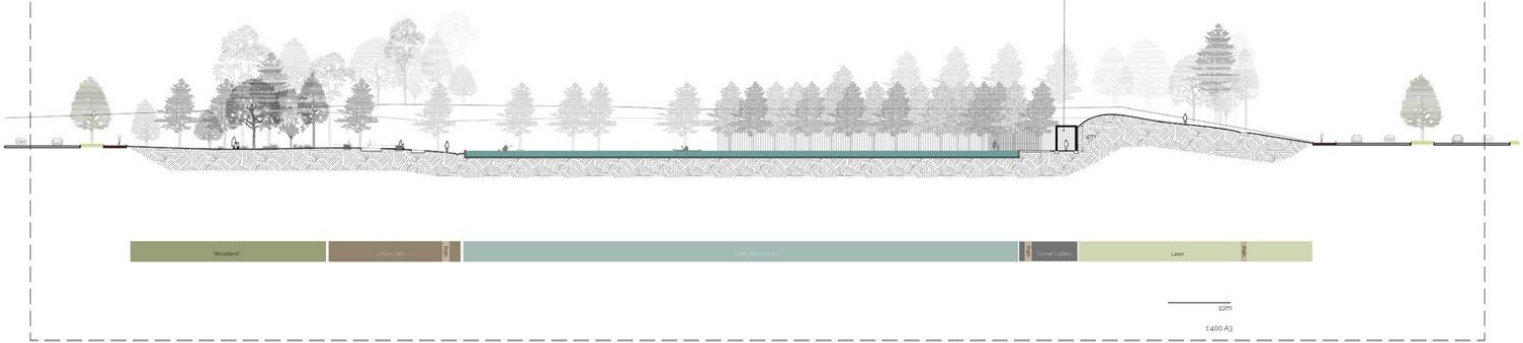




Mine Tunnel. Source: www.rhcl.nl



Section CC'



‘TUNNEL’ GALLERY

a gallery carved into exisiting slope; acts as a semi-enclosed spatial expereince. The Gallery showcased a more literal tunnel metaphor



SLOPING STEPS

Path along azolla pond in the sloping parkland zone







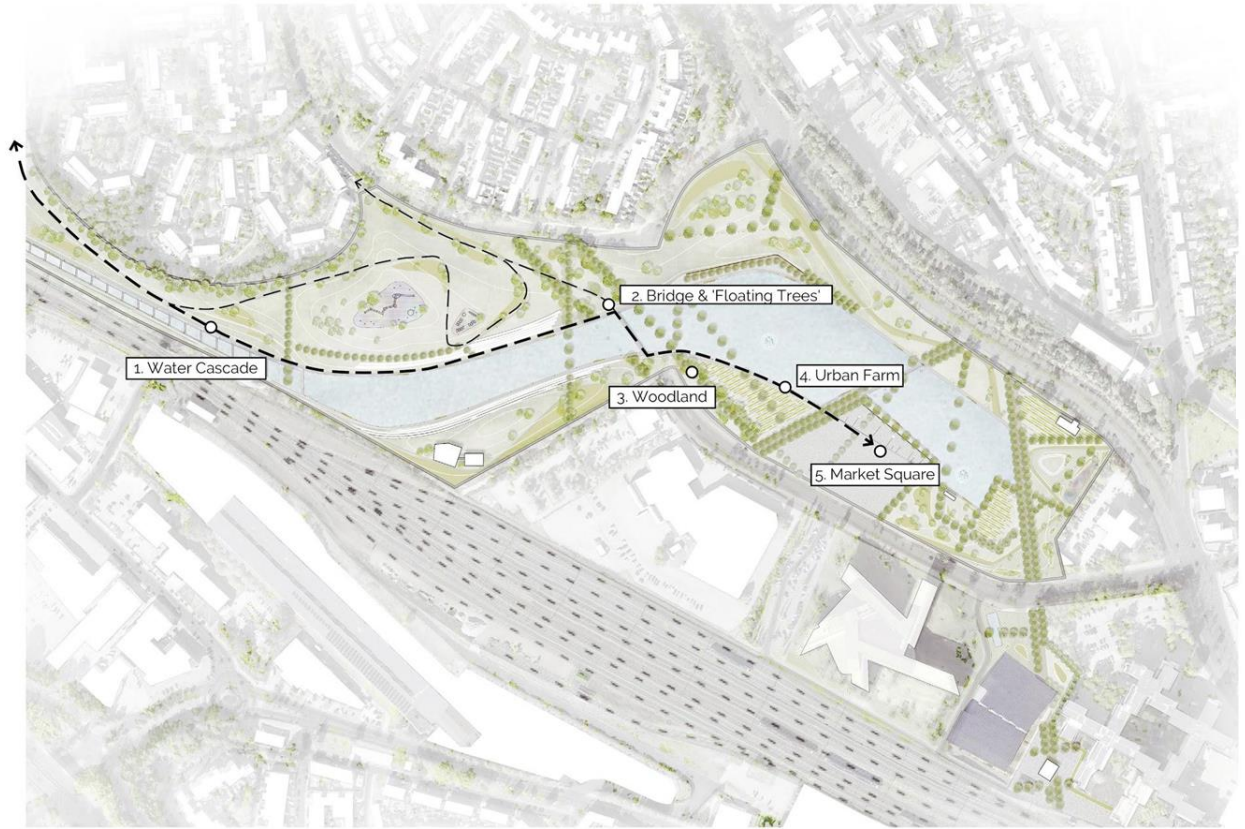
WATER CASCADE

A different spatial expereience with series of cascading azolla ponds









LOCAL USERS

EXAMPLE ROUTE 2

Local Resident Route

WATER CASCADE

One of the entrances from surrounding residential neighbourhood









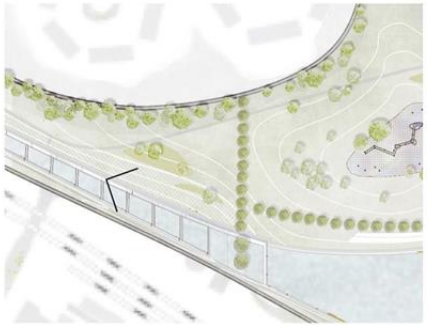














SLOPING STEPS

Path along azolla pond in the sloping parkland zone

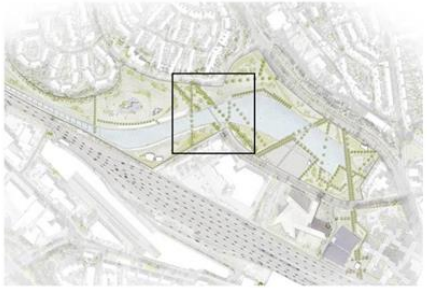


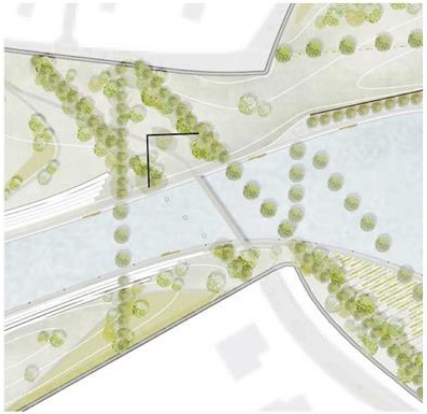




BRIDGE & ‘FLOATING TREES’

Birdeye view of the bridge crossing and the ‘floating trees’



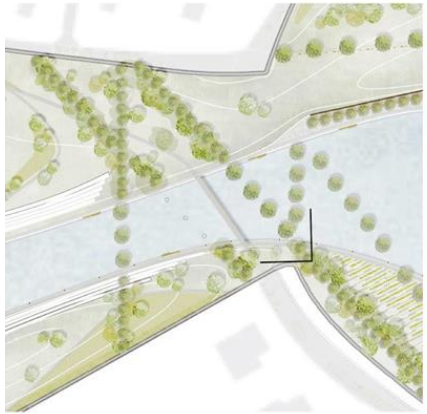




WOODLAND

Existing sloping topography gives a scenic nature-escape experience







URBAN FARMING

Some of the azolla ferns that are made into composts are used in the Urban Farming zones. These Urban Farming pocket spaces also provide bences for gathering.







MARKET SQUARE

The Square offers large scale social opportunities such as markets or events. The weekly market will be one of the places to promote azolla products.







MARKET SQUARE

The square features an educational playing area, and a flexible use space for market and events.



Market Square

MARKET SQUARE

The square features an educational playing area, and a flexible use space for market and events.



Market Square with flexible use

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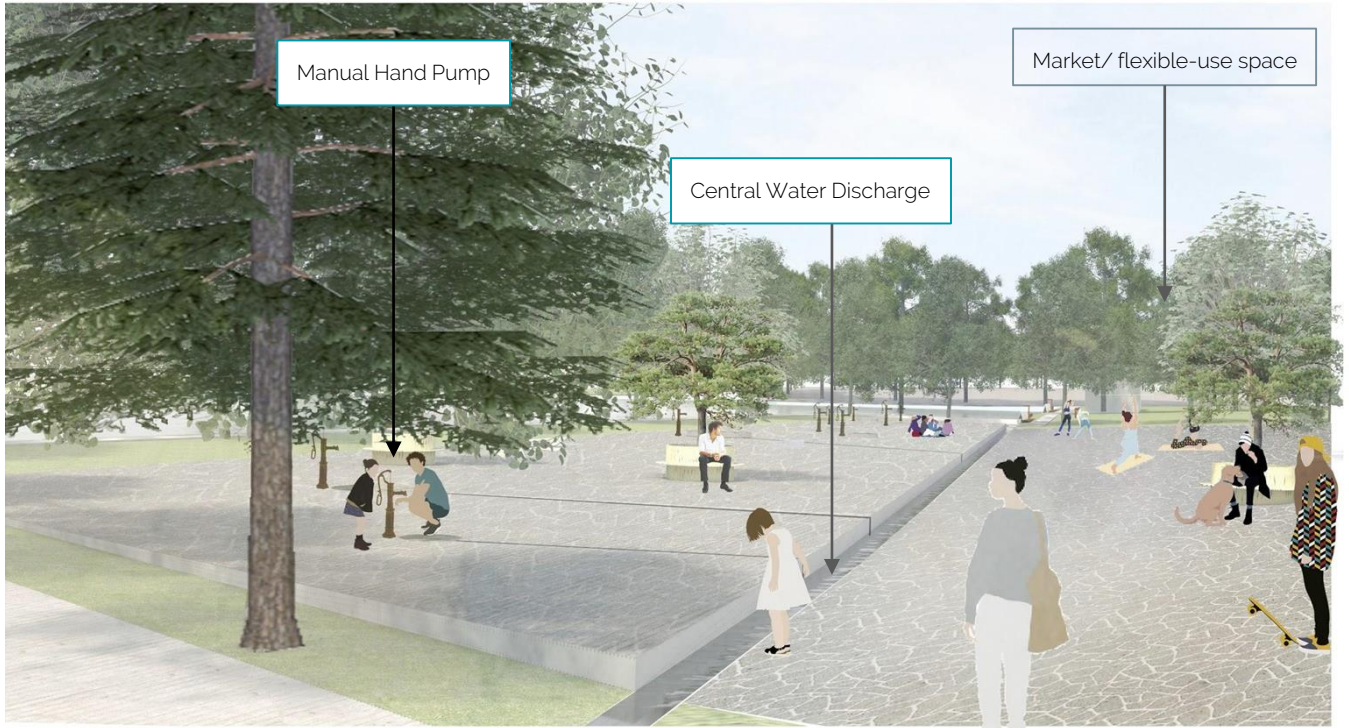
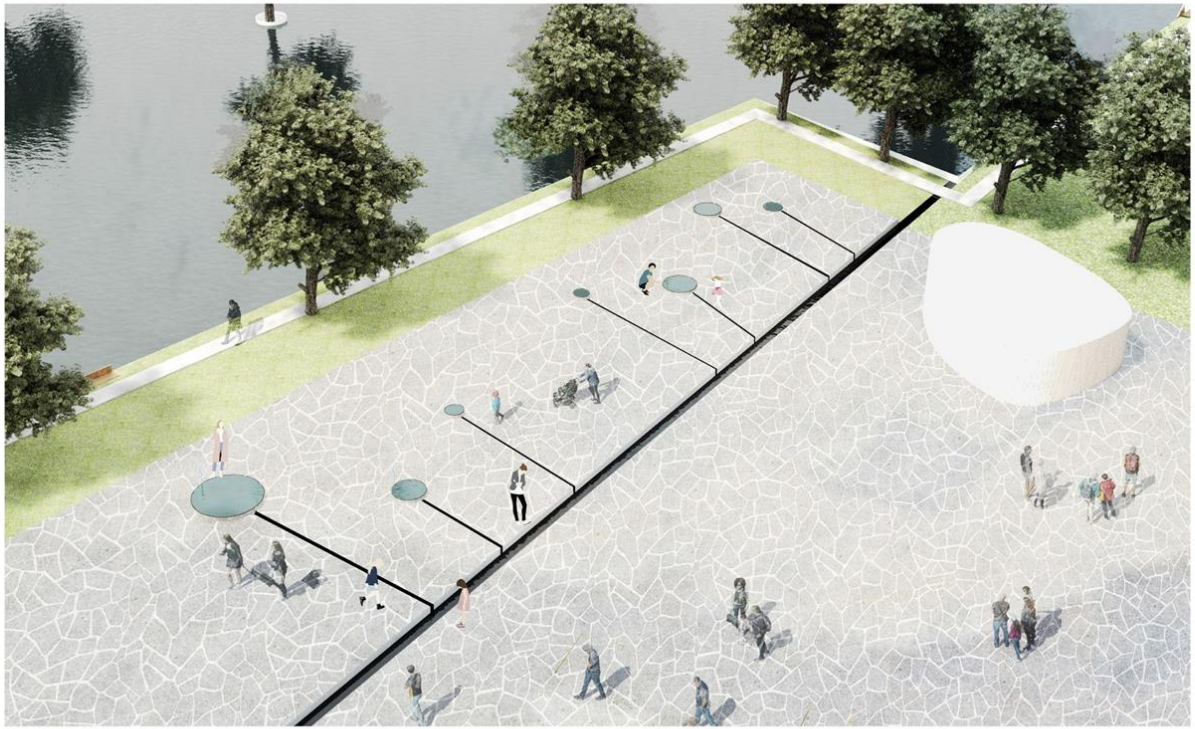


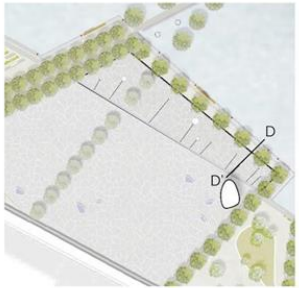
Market Square with flexible use

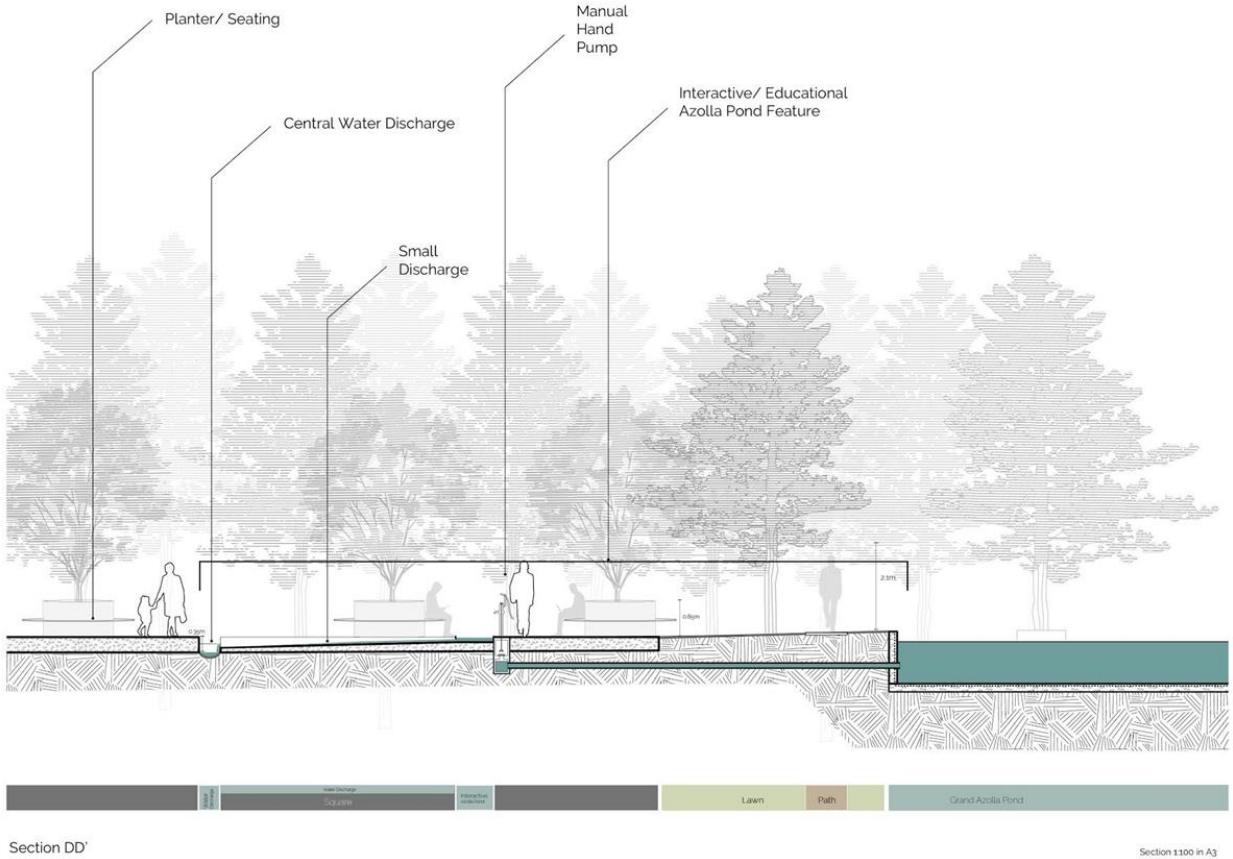


Birdeye View showing educational 'mini azolla ponds' features









Section DD'

Section 1:100 in A3

Planting Palette

Nitrogen-fixation Plant









Pinus sylvestris
(Scots Pine)

Crown shape: pyramidal

Crown structure: semi-open

height: 25 - 30m

Width: 10 - 15m



Source: https://www.ebben.nl/en/treeebb/pinylves-pinus-sylvestris/#?search%5Bfilt%5D=Pinus%20sylvestris

Pinus sylvestris 'Watereri'
(Dwarf Scots Pine)

Crown shape: wide pyramidal

Crown structure: dense

Height: 3 - 5 m

Width: 3 - 5 m



Source: https://www.ebben.nl/en/treeebb/pinwater-pinus-sylvestris-watereri/







Nitrogen-fixation Plant

Pinus sylvestris
(Scots Pine)

Crown shape: pyramidal

Crown structure: semi-open

height: 25 - 30m

Width: 10 - 15m



Source: https://www.stbeverst.nl/en/treeslib/pinus-sylvestris/#?searchQuery=Pinus%20sylvestris

Pinus sylvestris 'Watereri'
(Dwarf Scots Pine)

Crown shape: wide pyramidal

Crown structure: dense

Height: 3 - 5 m

Width: 3 - 5 m



Source: https://www.stbeverst.nl/en/treeslib/pinus-sylvestris-watereri/

Nitrogen-fixation Plant

Alnus glutinosa
(Common Black Alder)

Crown shape: wide pyramidal

Crown structure: semi-open

height: 10 - 20m

Width: 6 - 12m



Source: https://www.instantlineanursery.com.au/tree/common-alder-alnus-glutinosa/

Nitrogen-fixation Plant

Alnus incana 'Pendula'
(Weeping Grey Alder)

Crown shape: wide weeping

Crown structure: semi-open

Height: 6 - 8 m

Width: 3 - 5 m



Source: https://www.stbeverst.nl/en/treeslib/pinus-sylvestris-watereri/

Nitrogen-fixation Plant

Alnus Incana
(Grey Alder)

Crown shape: egg-shaped

Crown structure: semi-open

Height: 12 - 18 m

Width: 6 - 10 m



Source: https://www.stbeverst.nl/en/treeslib/pinus-sylvestris-watereri/

Nitrogen-fixation Plant

Alnus Incana 'Aurea'
(Golden Alder)

Crown shape: egg-shaped

Crown structure: semi-open

Height: 5 - 10 m

Width: 3 - 6 m



Source: https://www.gardensdream.co.uk/alnus-incana-aurea-tree-p3985

4.4.7 Plant Palette

Lawn:

Lolium perenne
(perennial ryegrass)



Source: https://www.elkmoundseed.com/elk-mound-seed/perennial-ryegrass-fig-50/

Shrub:

Syringa vulgaris
(Common lilac)



https://burtsgh.com/product/syringa-vulgaris-common-lilac/

Winter Flowering
(Mar - Apr)

Prunus spinosa
(Blackthorn)



Source: https://hustratedgardener.com/2015/04/28/spring-flower-candy-prunus-spinosa/

Water Fern:

- Turns red in autumn
- Nitrogen-fixation plant

Azolla filiculoides
(Azolla/ Mosquito fern/ Fairy Moss)



(see fig 21)

Groundcover/ Flower:

Long Flowering Period

Bellis perennis
(Common Daisy)



- flowering:
April - September,
December - March

- 5 - 15 cm

(https://www.floraveneederlandnl/planten/madeliefje/

Source: http://www.freenatureimages.eu/Plants/Flora/%20A-B/Bellis%20perennis%2C%20Daisy/index.html

Centaurea cyanus
(Cornflower)



- flowering:
June - August

- the species has deteriorated sharply due to modern intensive arable farming and herbicides

- reaches a height of 30-60 cm

(Flora of the Netherlands, https://www.floraveneederlandnl/planten/korenbloem/)

Source: https://www.lensculture.com/projects/2377-poppies-cornfield-weeds

Vinca minor
(Common Periwinkle/ Myrtle)



Source: https://plants.ces.ncsu.edu/plants/vinca-minor/

Nitrogen-fixation Plant

Trifolium pratense
(Red Cover)



- Flowering:
May to August

- nitrogen-fixation property

- up tp 50 cm

(Flora of the Netherlands, https://www.floraveneederlandnl/planten/rode_klaver/)

Source: https://www.wildlifetrusts.org/wildlife-explorer/wildflowers/red-clover

Papaver dubium
(Pale poppy)



- flowering:
May - August

- the species has deteriorated sharply due to modern intensive arable farming and herbicides

- 20-60 cm

(Flora of the Netherlands, https://www.floraveneederlandnl/planten/blake_klaproos/)

Source: https://www.gardenia.net/plant/papaver-rhoeas-common-poppy

Cichorium intybus
(Wild chicory)



- Flowering:
July to August

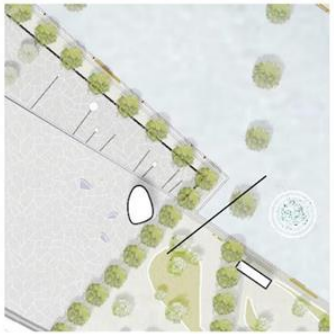
- 30 - 120 cm

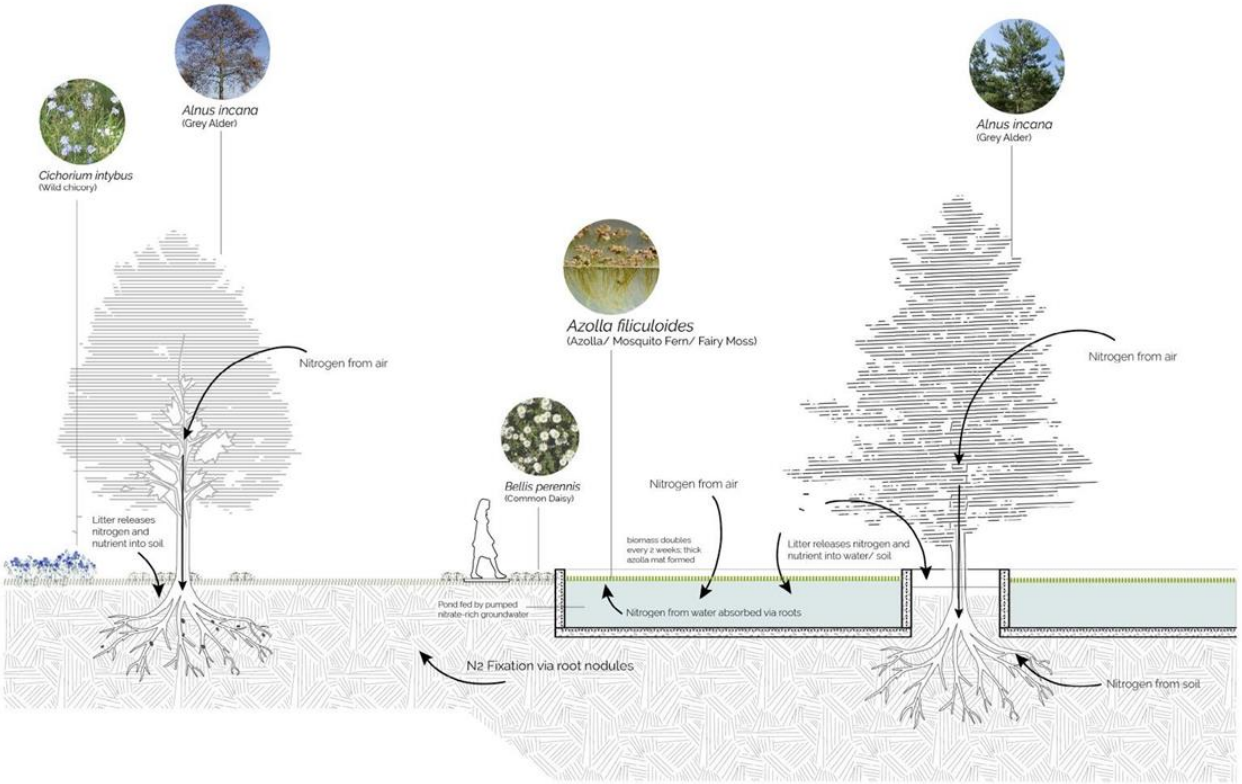
(Flora of the Netherlands, https://www.floraveneederlandnl/planten/wilde_cichorei/)

Source: https://eattheplanet.org/chicory-street-side-salad-greens-and-tea/

Micro Ecosystem

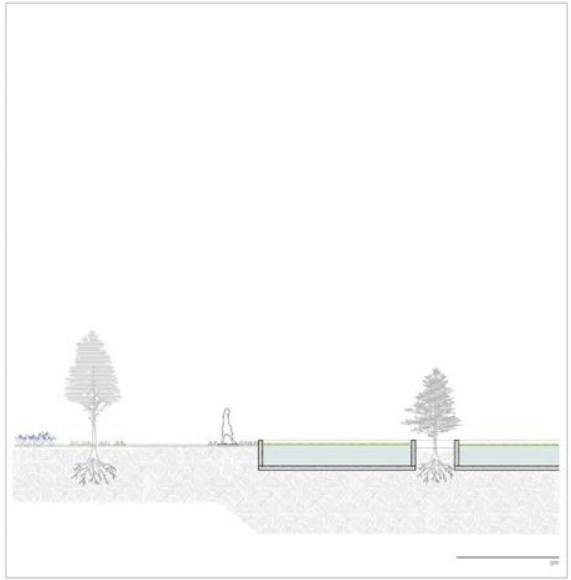
Planting section



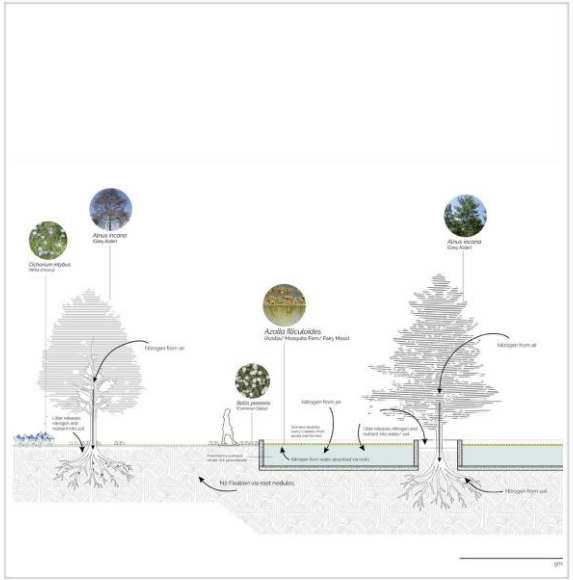


Temporal Change - Growth

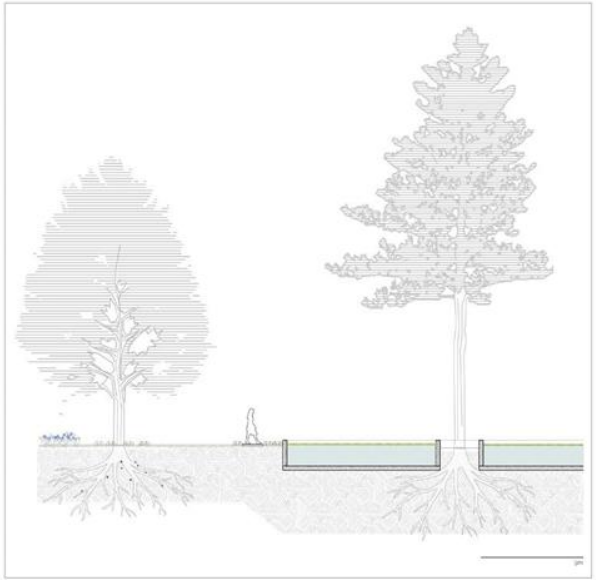
Planting section



Start year



10 - 20 years

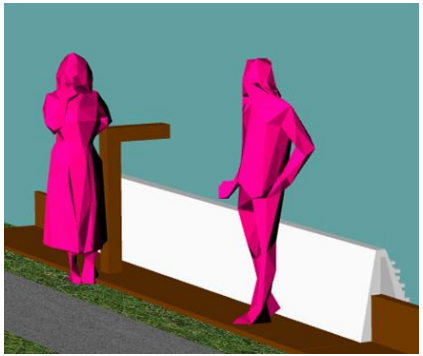


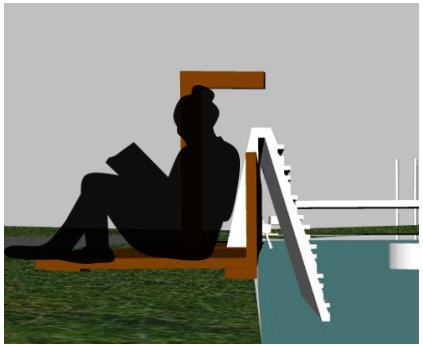
30 - 50 years



TECHNICAL DESIGN







Micro-circulation

Informal seating opportunity
Symbolises industrial memory

Micro-circulation Feature

Corten Steel



Carbon-neutral Concrete*
(e.g. Hempcrete) /

Recycled Concrete**
(e.g. Superlocal, Parkstad)

Wood

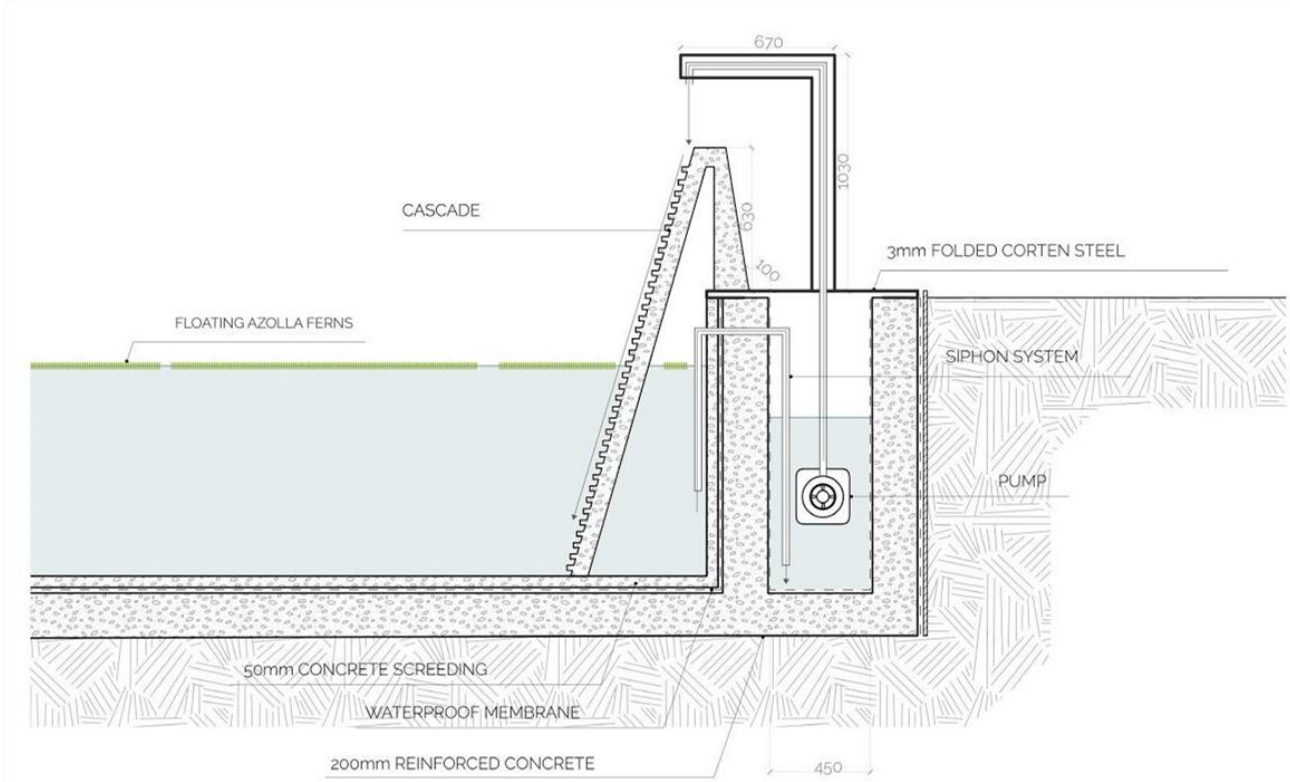




* Recycled concrete (from demolished buildings) experimental project in Kerkrade Parkstadm developed by Superlocal.



** Source: https://www.astm.org/standardization-news/?q=features/c2f-green-building-hempcrete-maze.html



Rhythm Calendar

Flowing Spectacles

Every 1 or 2 months

Large scale water change

'Chimney-fountain' appears

Azolla Harvest



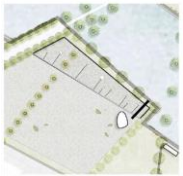


Daily

Interactive water feature

Small Azolla Harvest





Constant

Micro water-circulation





Winter

Option:

- Water feature without Azolla

- Big Pond: Ice-Skating Rink

- Small Ponds:
partially emptied for pop-up features, e.g. for different artist

Conclusion

Park should never be single purposed, especially in a shrinking city. Park as a cross-domain infrastructure should take on more roles, such as social, environmental and financial roles. By utilising these potentials, park can be redefined as a valuable component of the city, instead of a burden.

My project is an attempt to create multiple meanings in park, and it explores and demonstrates the overlapping potential of social restoration and nitrate remediation.

Conclusion

Park should never be single purposed, especially in a shrinking city. Park as a cross-domain infrastructure should take on more roles, such as social, environmental and financial roles. By utilising these potentials, park can be redefined as a valuable component of the city, instead of a burden.

My project is an attempt to create multiple meanings in park, and it explores and demonstrates the overlapping potential of social restoration and nitrate remediation.

Empowering Community With a New Nitrate Industry

Designing a **Nitrate-Diluting Landscape System**

Creating a Place that Attracts People (**Repeated Interactions**)

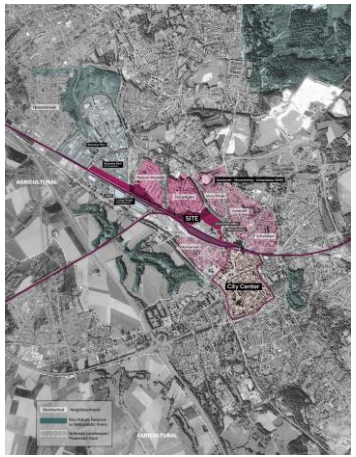
Building up **Pride/ Sense of Place**

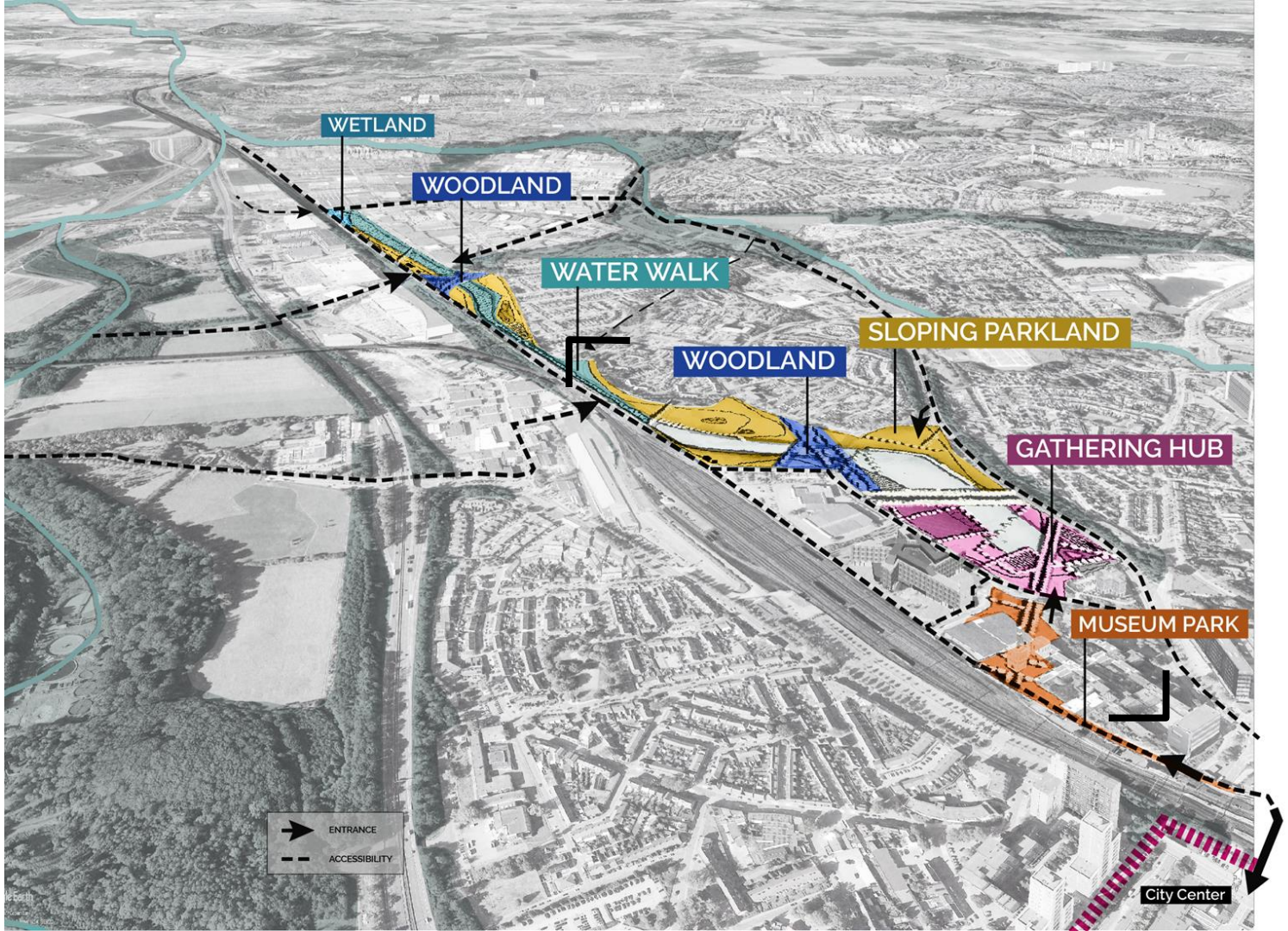
Integrating Azolla In a Daily **Park Setting**

Thank You

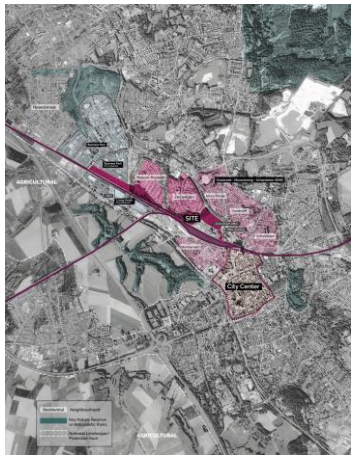
additional

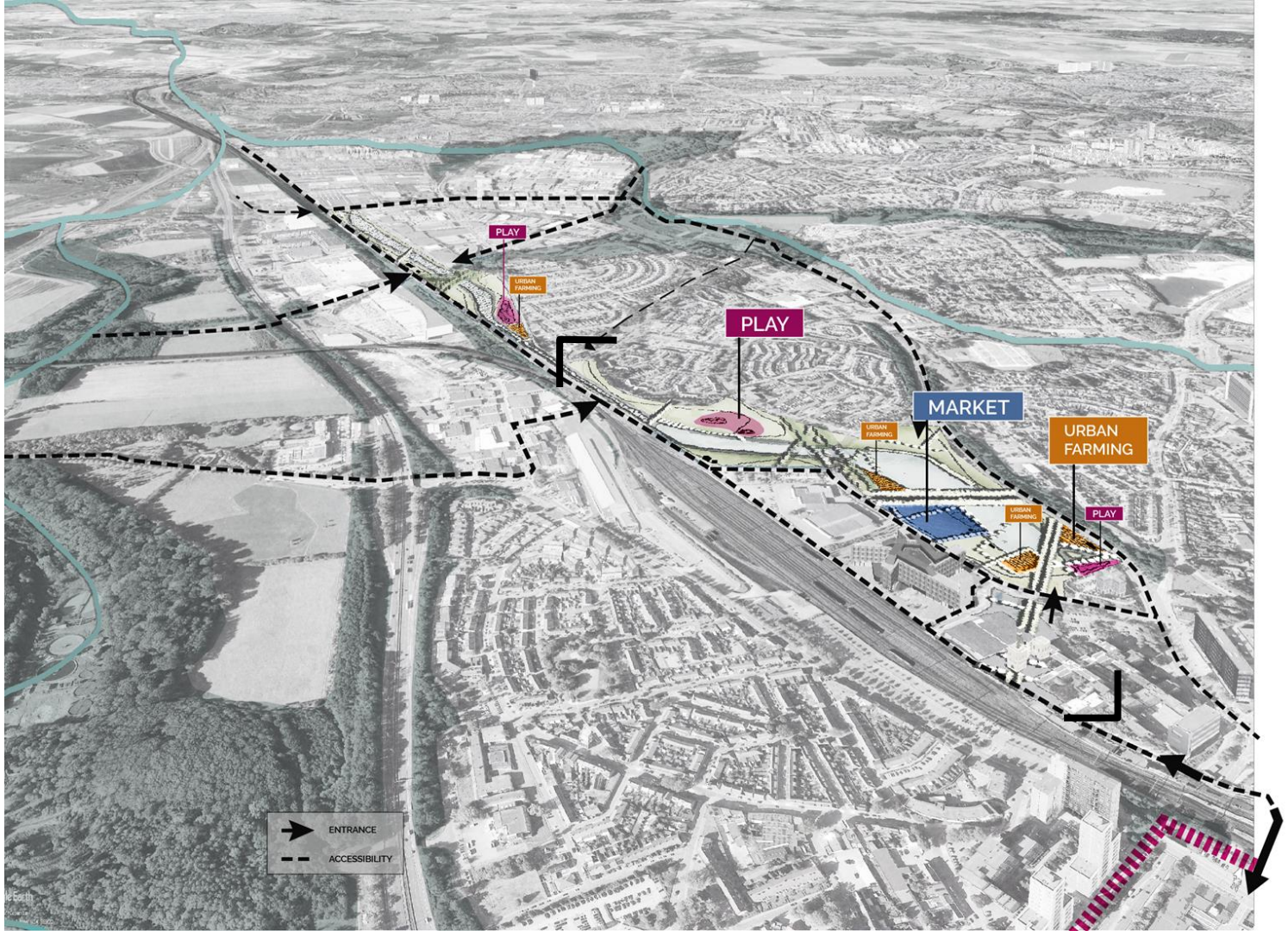
Azolla City Park





Azolla City Park





Dug out soil from making ponds:
48000 tons of soil



Soil from pond

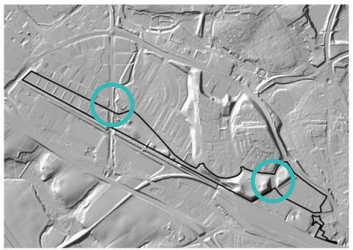


Fig 53. Hillsshade from Ahn Viewer

