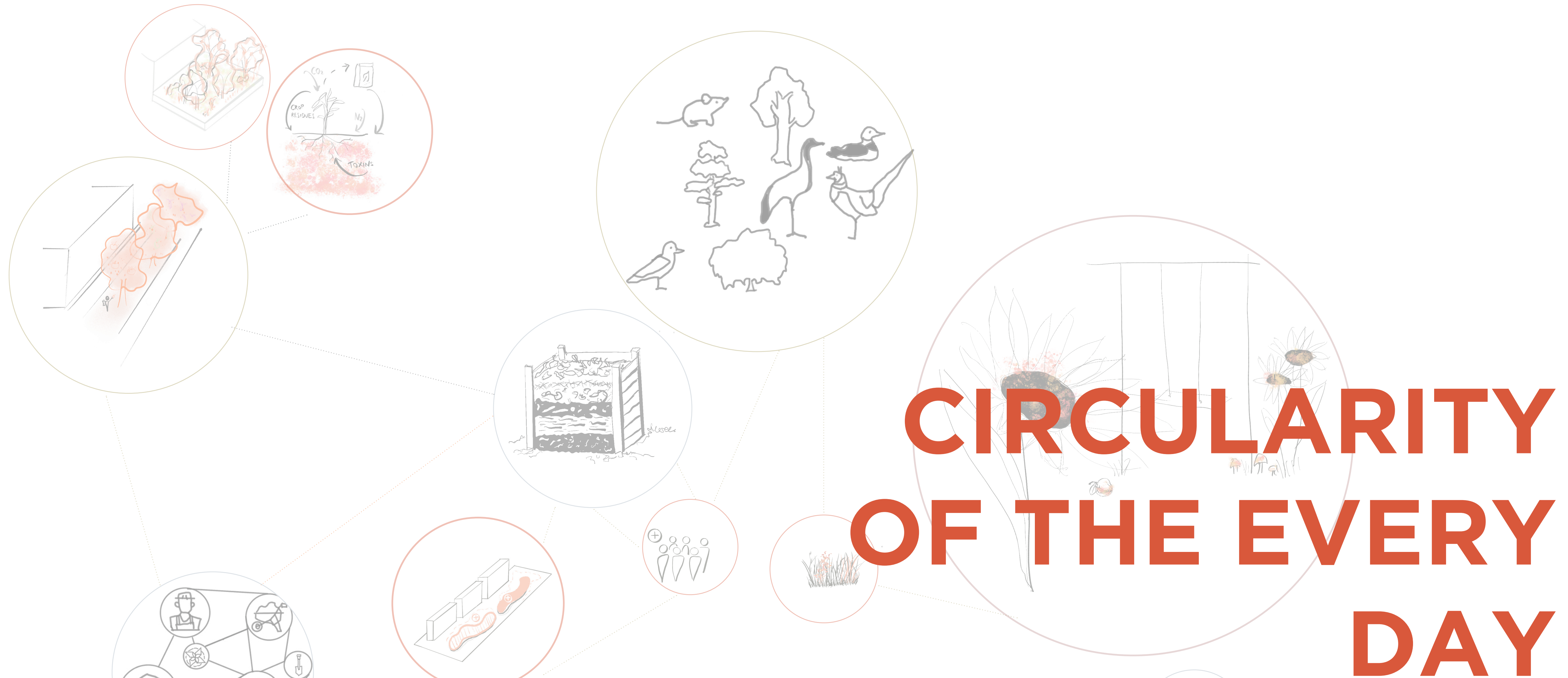




**A Pattern Language for the Transition towards a
Circular Food System of the Everyday Life in Schalkwijk**

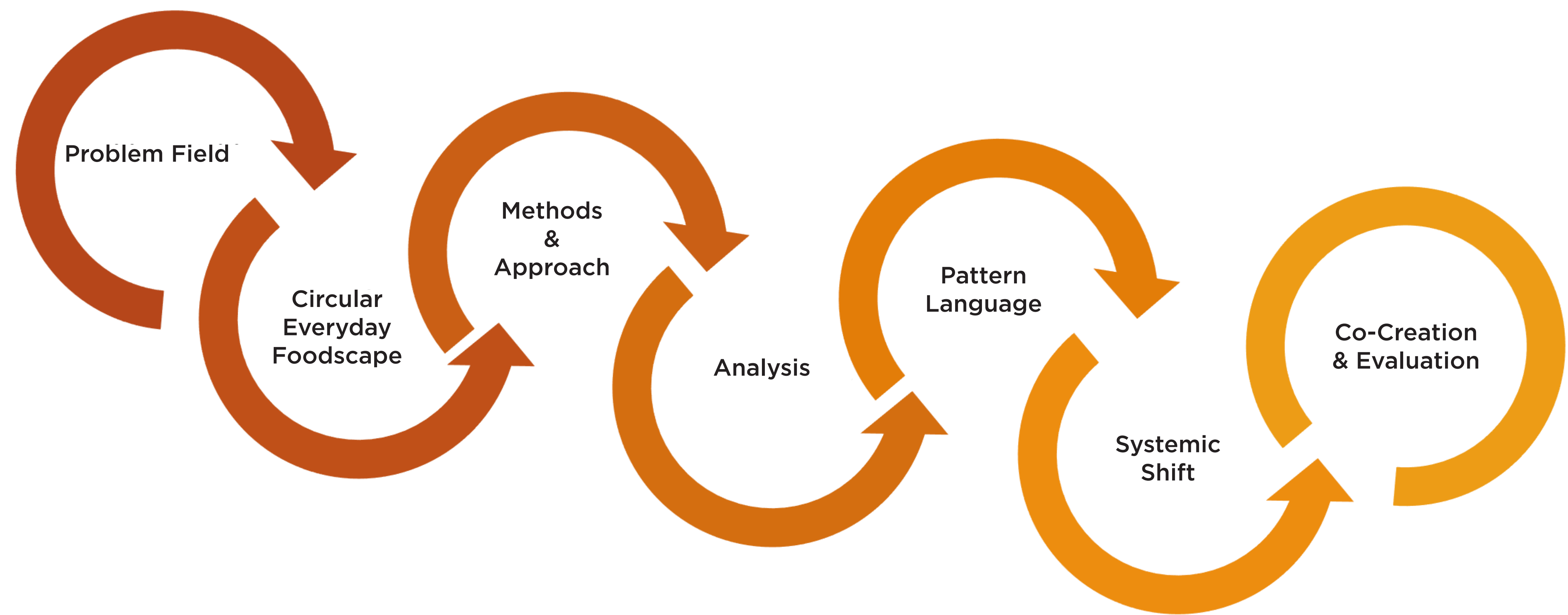
Elena Grimbacher

Final Presentation

19. January 2024

First mentor: Dr. Dipl. -ing. Alexander Wandl Second Mentor: Dipl. -ing. Birgit Hausleitner Exam committee: Ir. Y.J. Cuperus Student No. 5626536

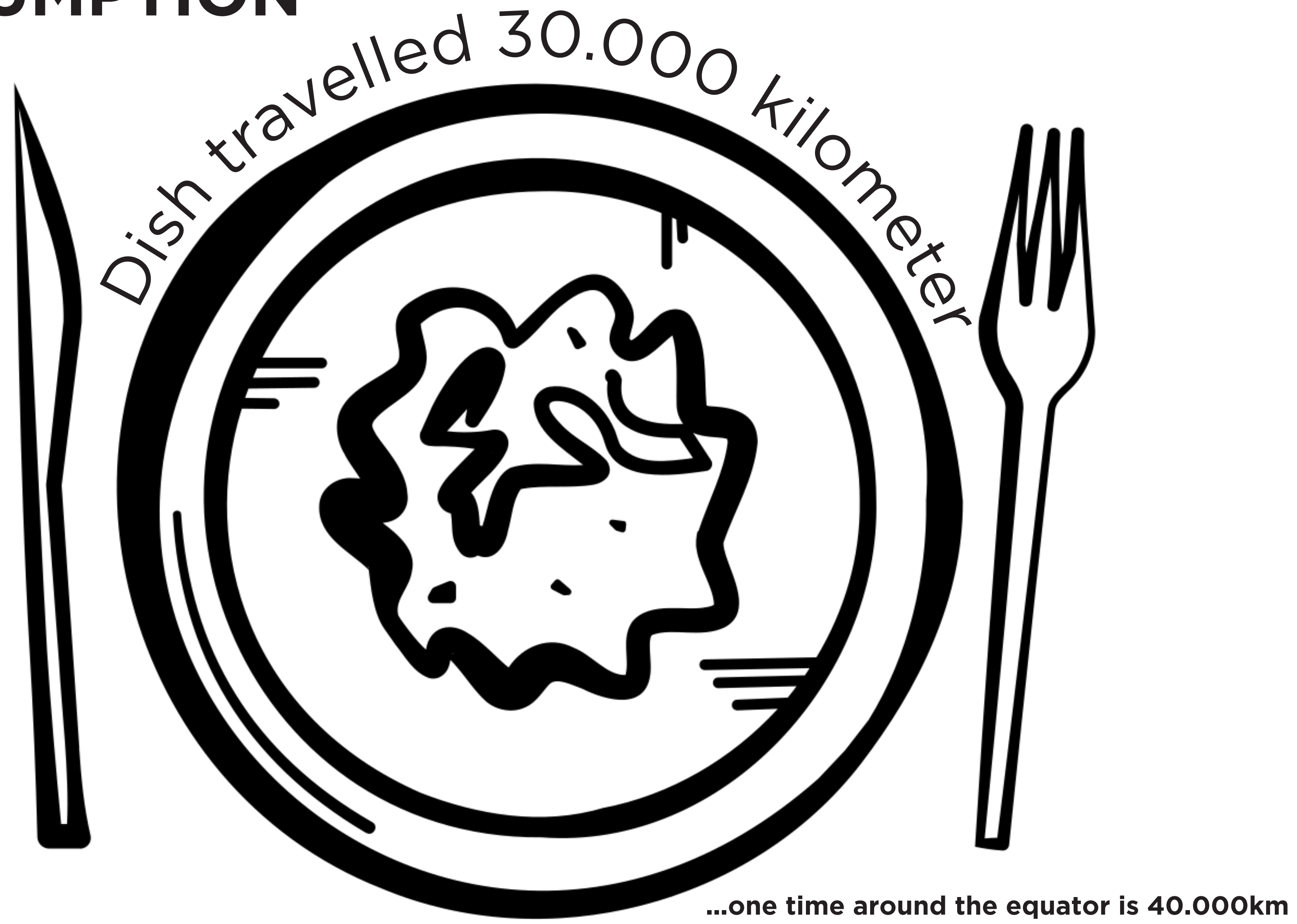
CONTENT





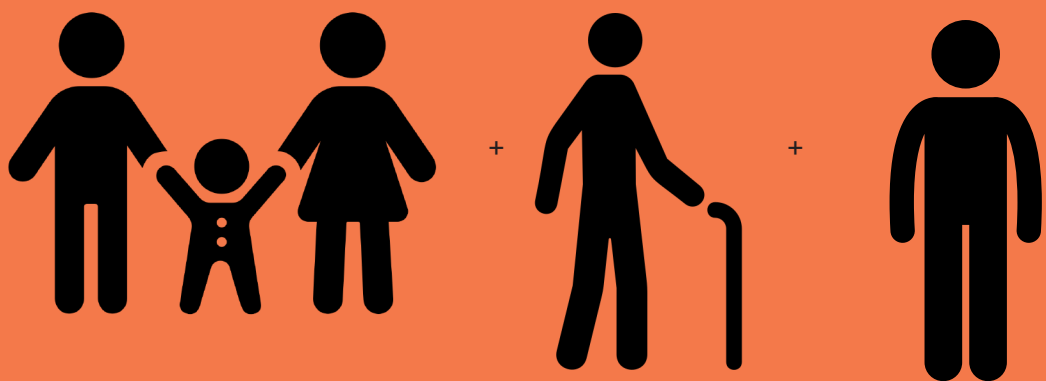
**Have you ever
wondered:
Where does the
food on your
plate come
from?**

FOOD CONSUMPTION



consequences due to cities as driver
for change due to innovation and
urban growth:

**climate crisis, growing scarcity of natural resources,
economic instability, and social inequality**



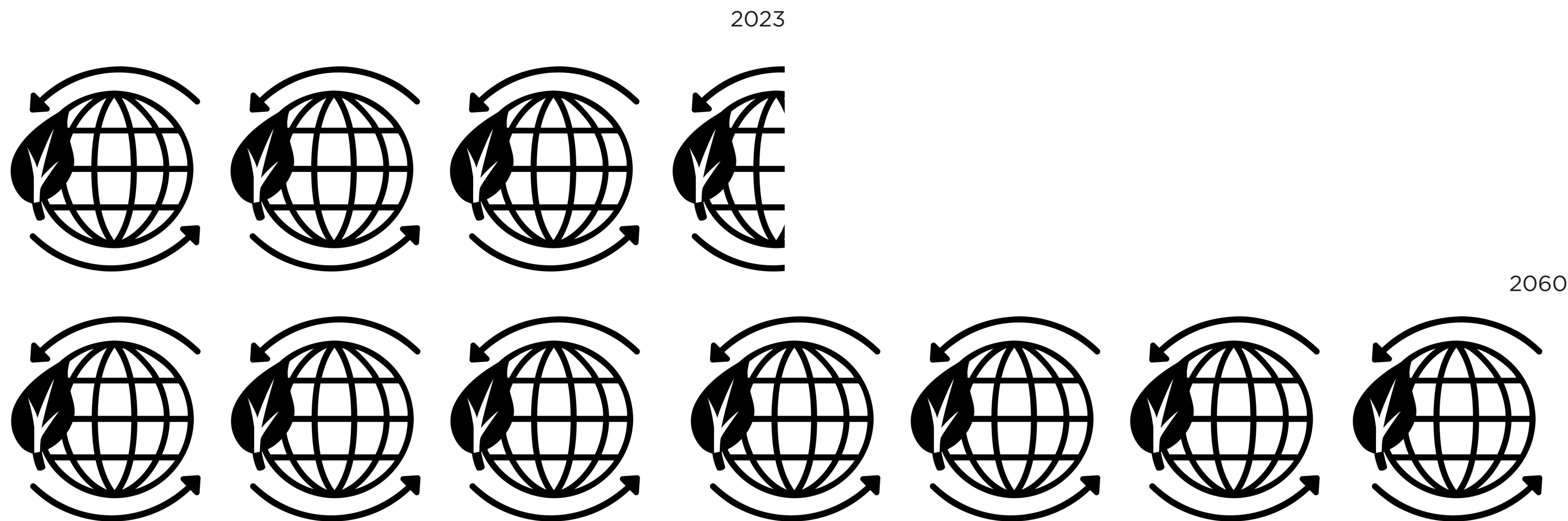
**2070: 20,6 million residents
in NL due to migration &
increasing lifespans**

CBS. (2023, April 11)

growth.

DUTCH FOOTPRINT

... if everyone lived like the Dutch we would need **3,5 earths** to cover the needed consumption

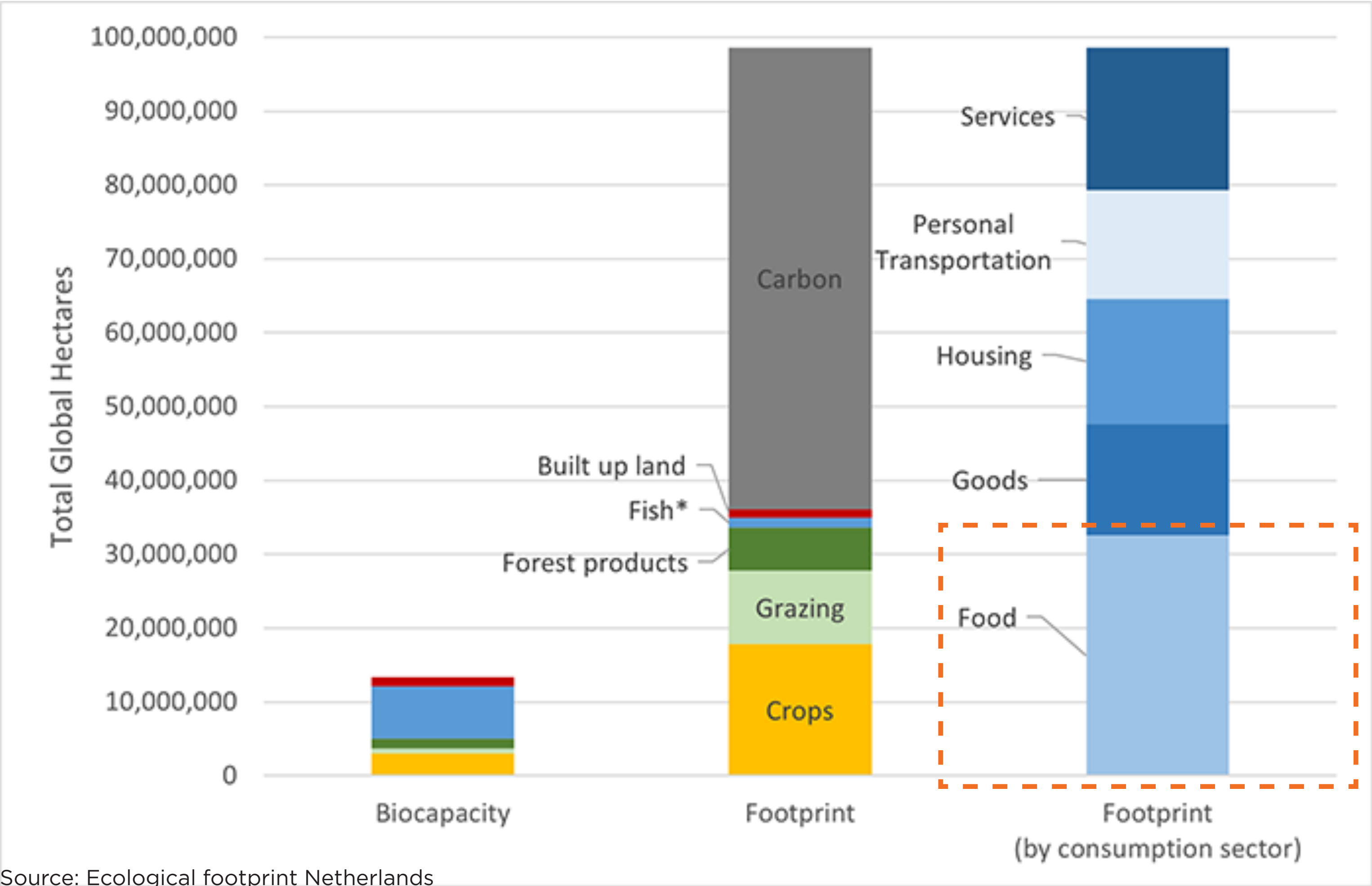


global resource use is estimated to DOUBLE by 2060 (PBL 2023).

Soruce: Earth Overshoot Day. <https://www.overshootday.org/newsroom/press-release-dutch-overshoot-day-2023-nl/>

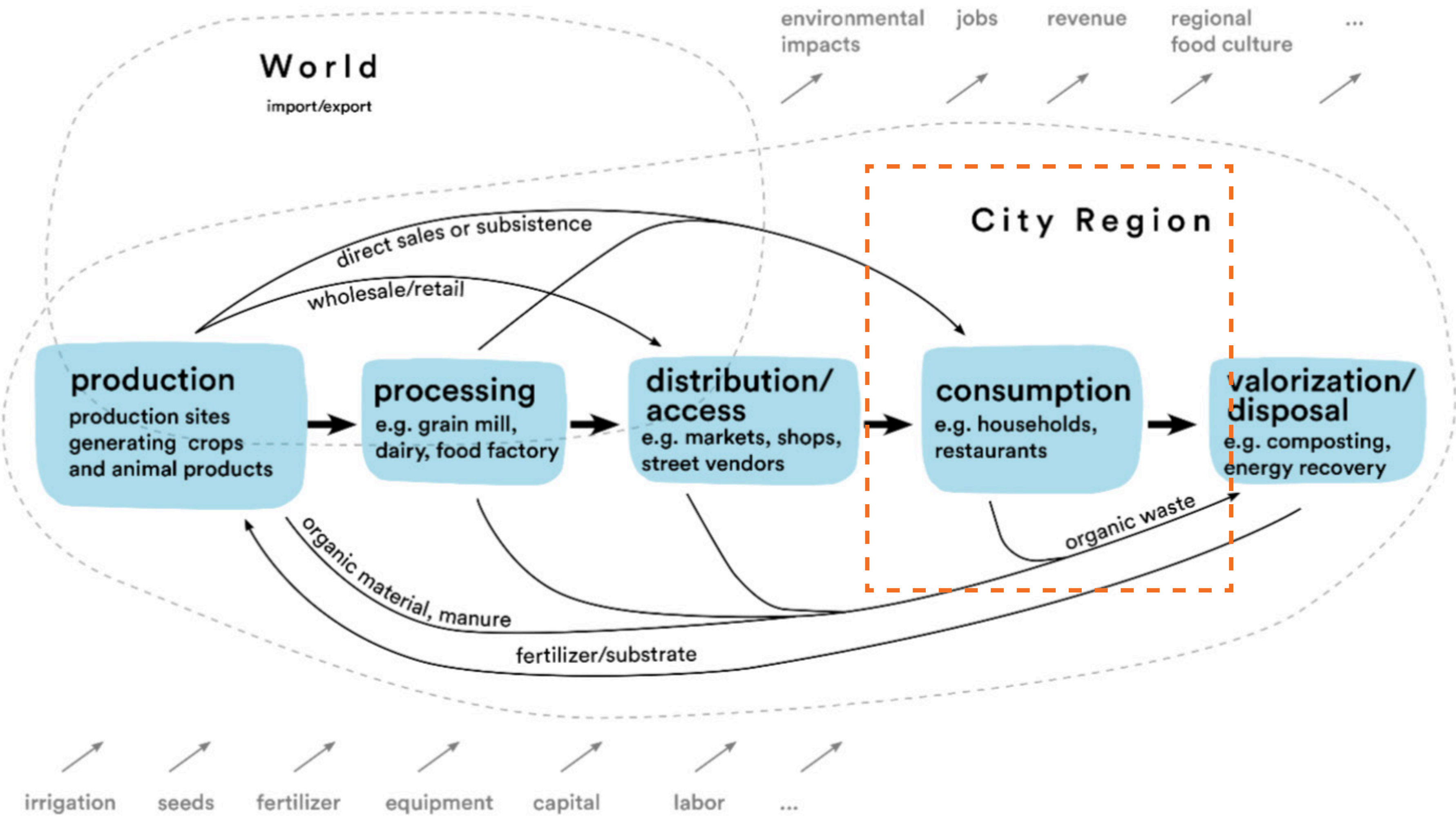
FOOD SECTOR

The food consumption sector has a great influence on the immense Dutch footprint.



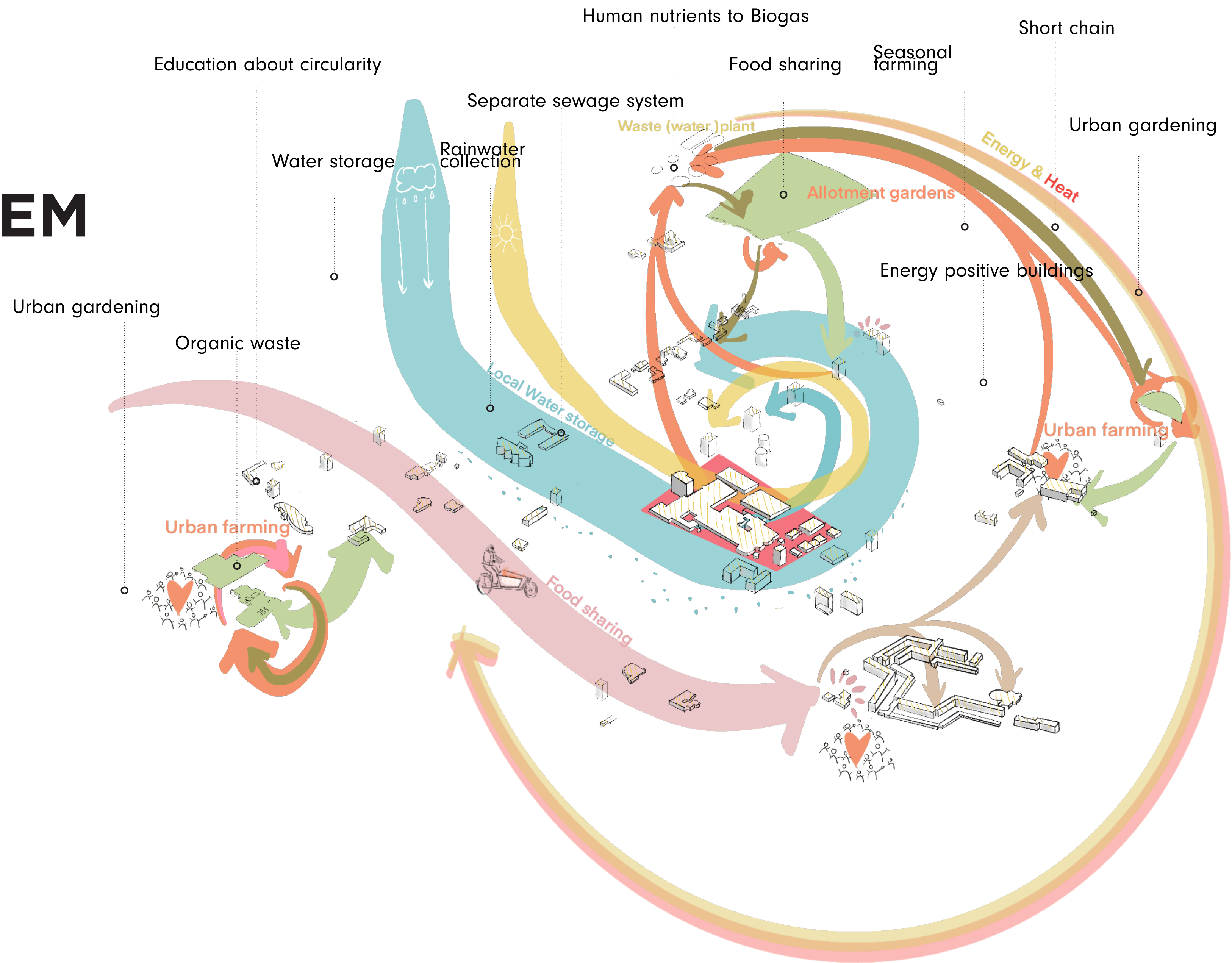
Source: Ecological footprint Netherlands

LINEAR FOOD SYSTEM



Spatial components of the urban food system by Christoph Kasper, Juliane Brandt, Katharina Lindschulte & Undine Giseke (2017)

VISION CIRCULAR FOOD SYSTEM



WHAT IS CIRCULARITY ?



**Reuse,
Repurpose,
Recycle**



**Maintaining
Original
Value**



Nutrient Cycle

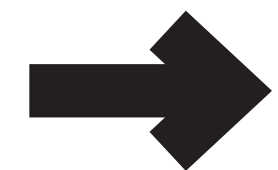


**Local & Global
Impact**

WHAT IS CIRCULARITY ?



The goal is for the Dutch economy to be completely circular by 2050

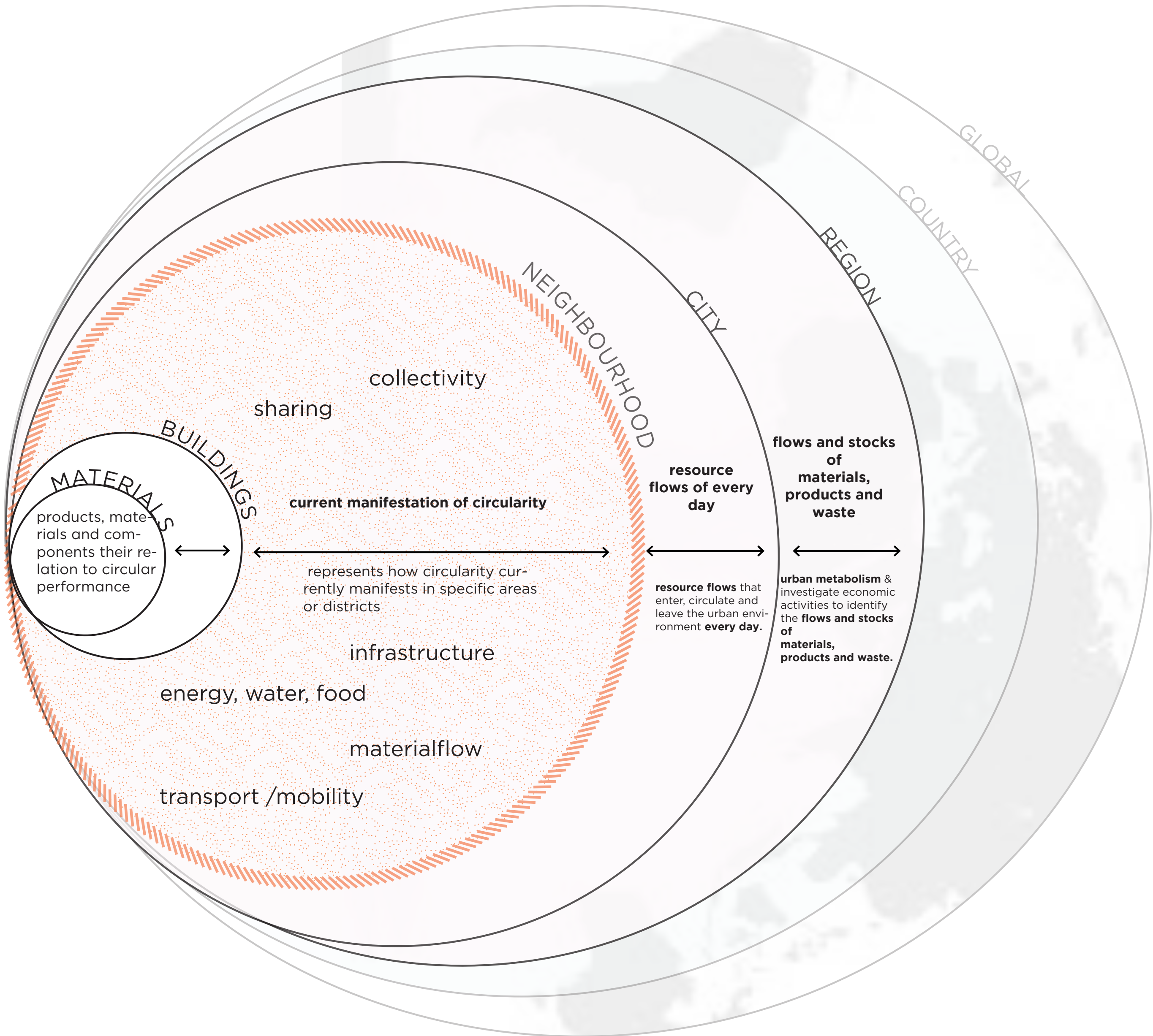


currently not reachable according to PBL

`Integrale Circulaire Economie Rapportage` 2023

NEIGHBORHOOD SCALE AS AN OPPORTUNITY FOR CLOSING LOOPS

Neighbourhoods hold great potential for closing loops (Codoban and Kennedy 2008; Engel-Yan et al. 2005; Pomponi & Moncester 2017).

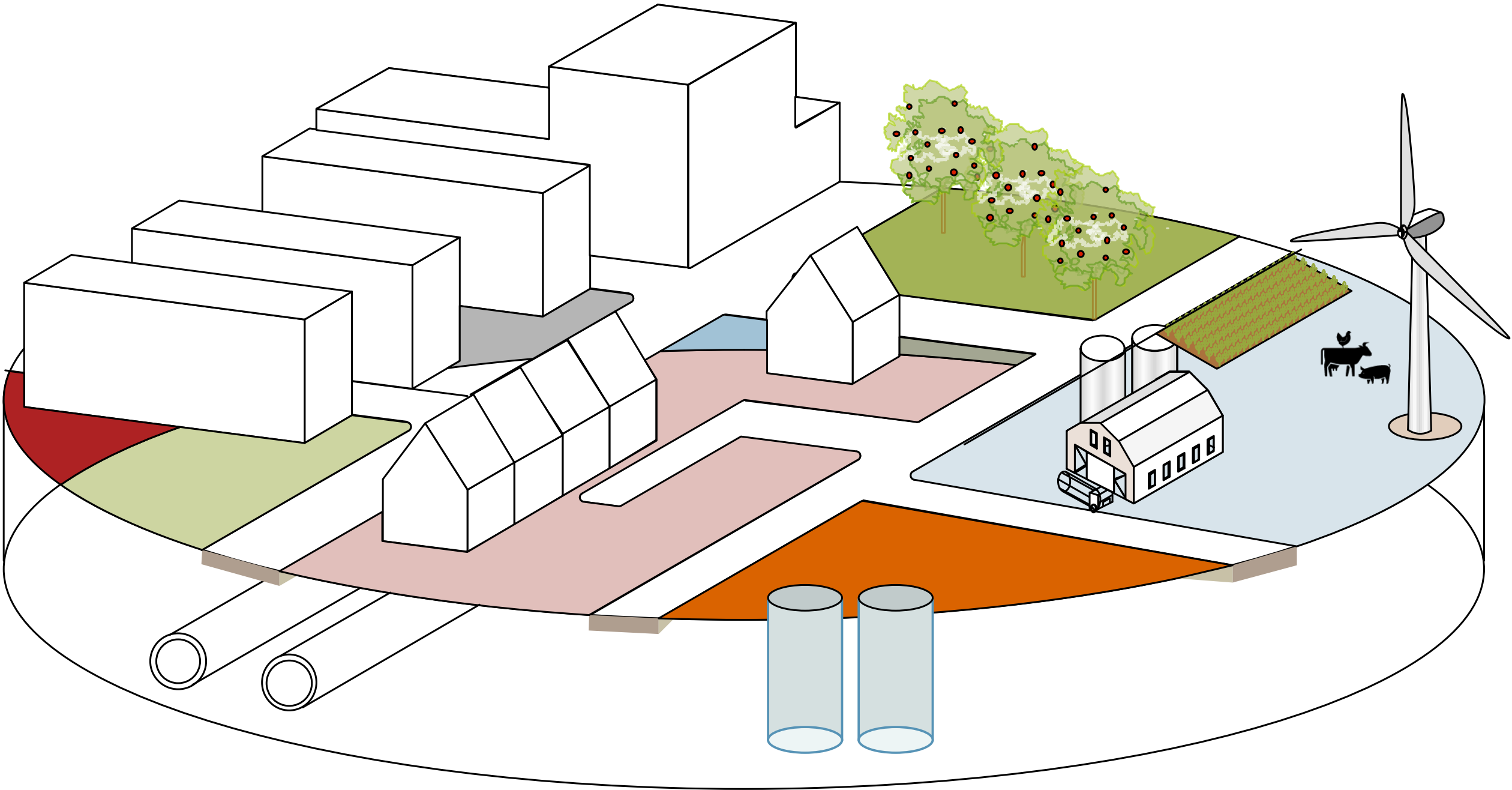


A CIRCULAR NEIGHBOURHOOD

LOCAL FOOD PRODUCTION

RENEWABLE ENERGY

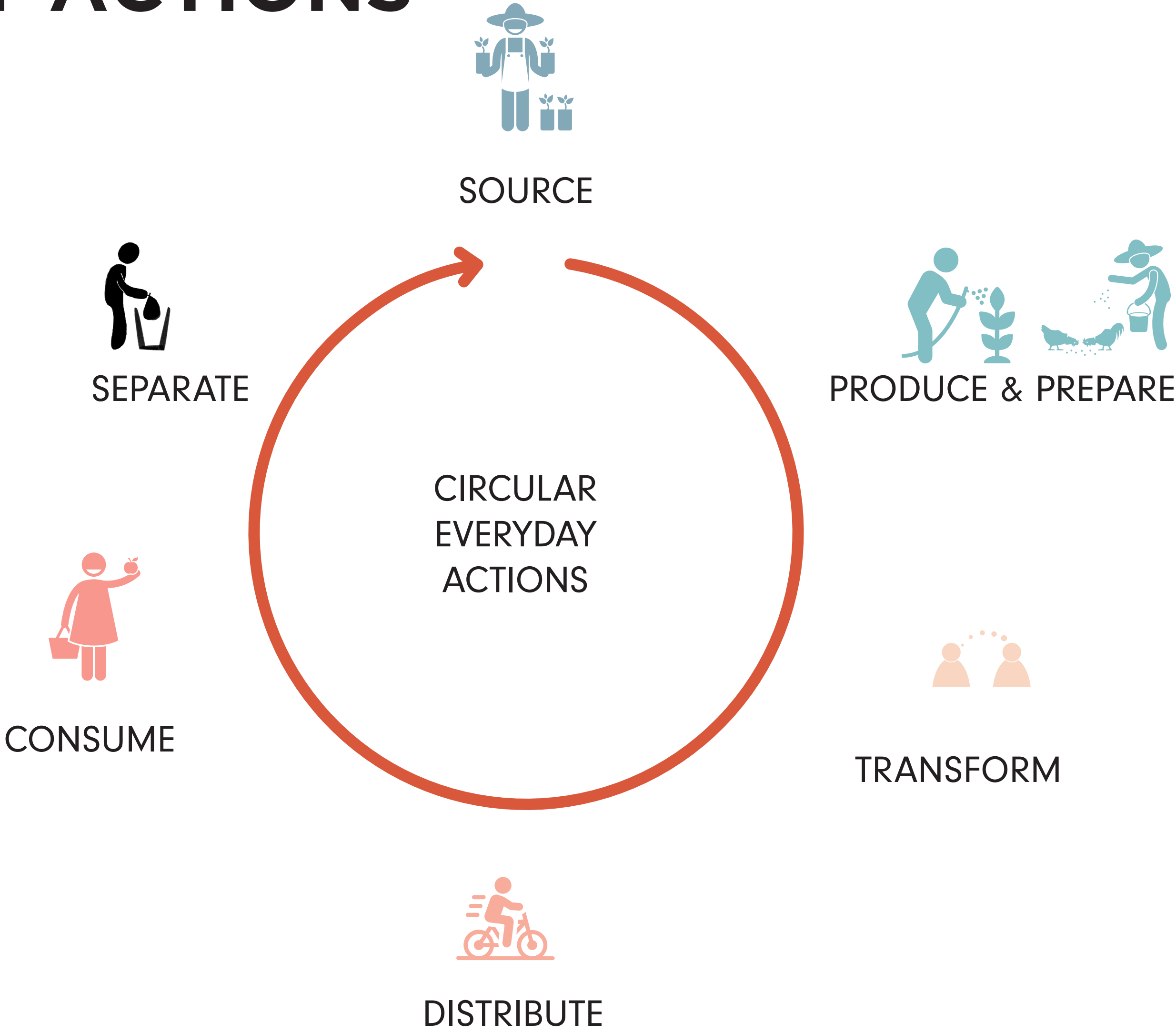
WATER MANAGEMENT



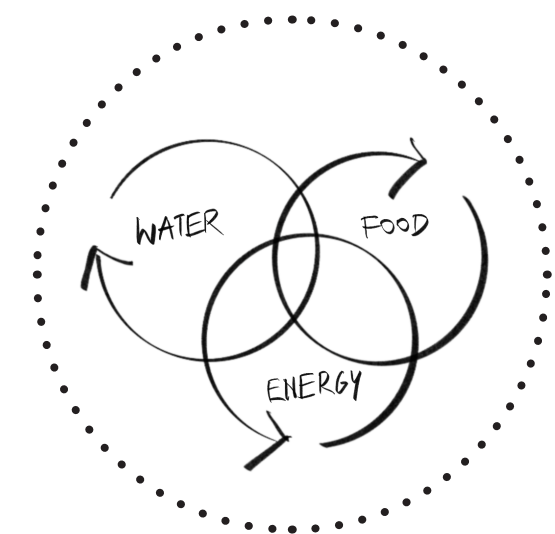
building upon social innitatives, sustainable innoventions, and values



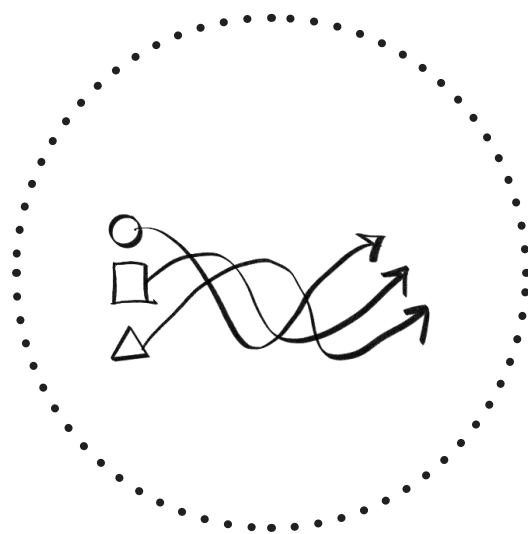
CIRCULAR DAILY ACTIONS



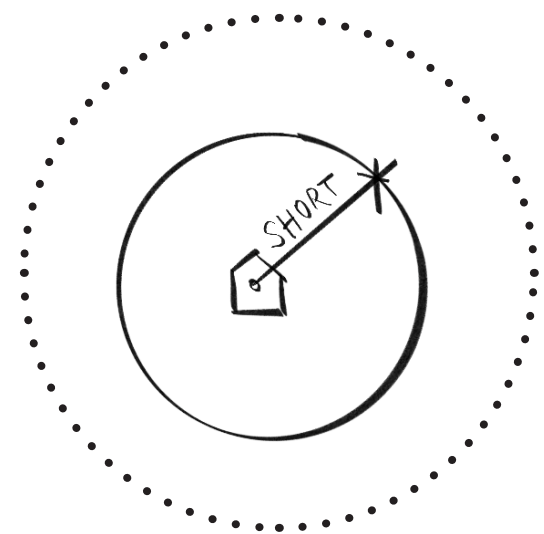
A CIRCULAR EVERYDAY FOODSCAPE



Close loops



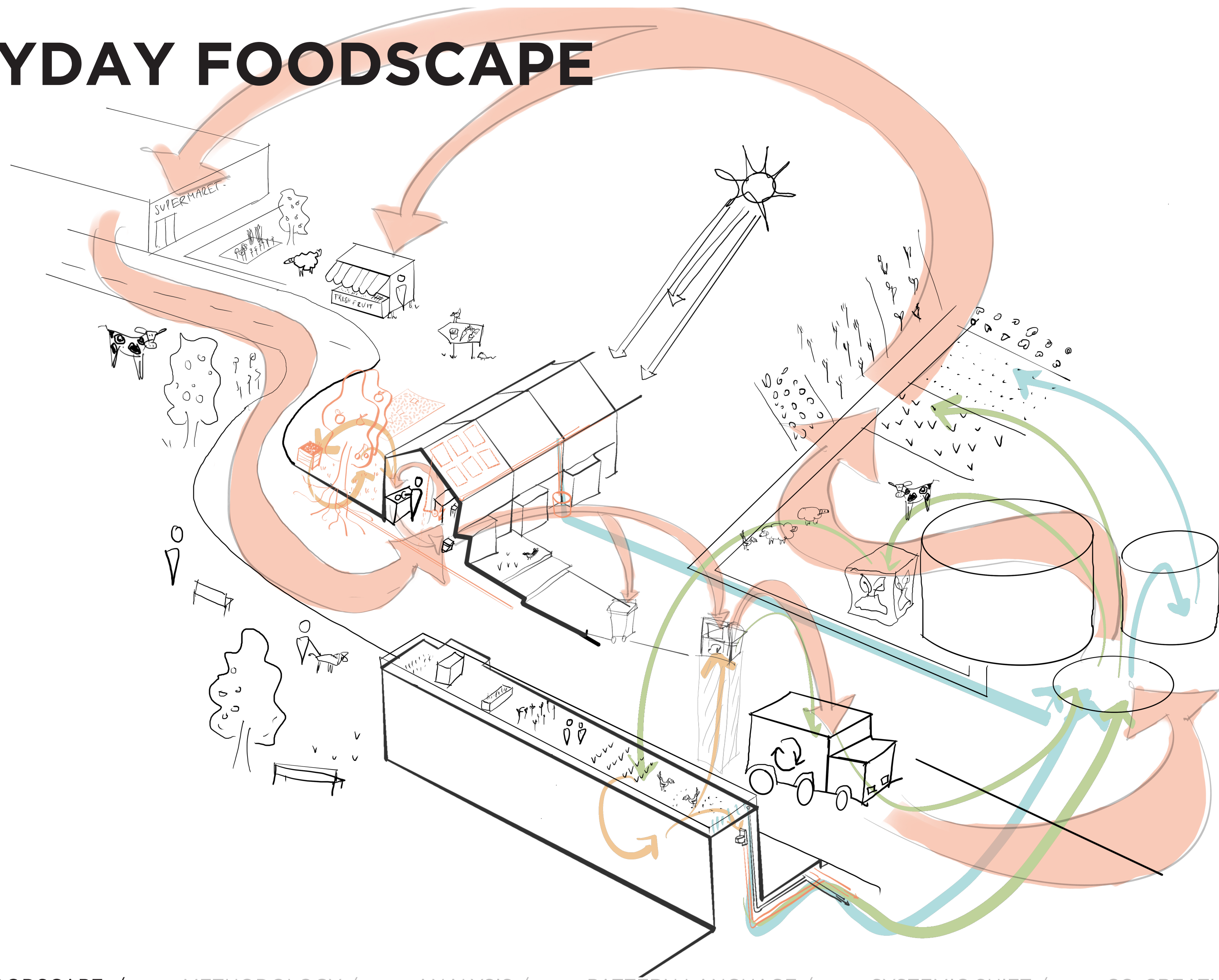
Collaboration



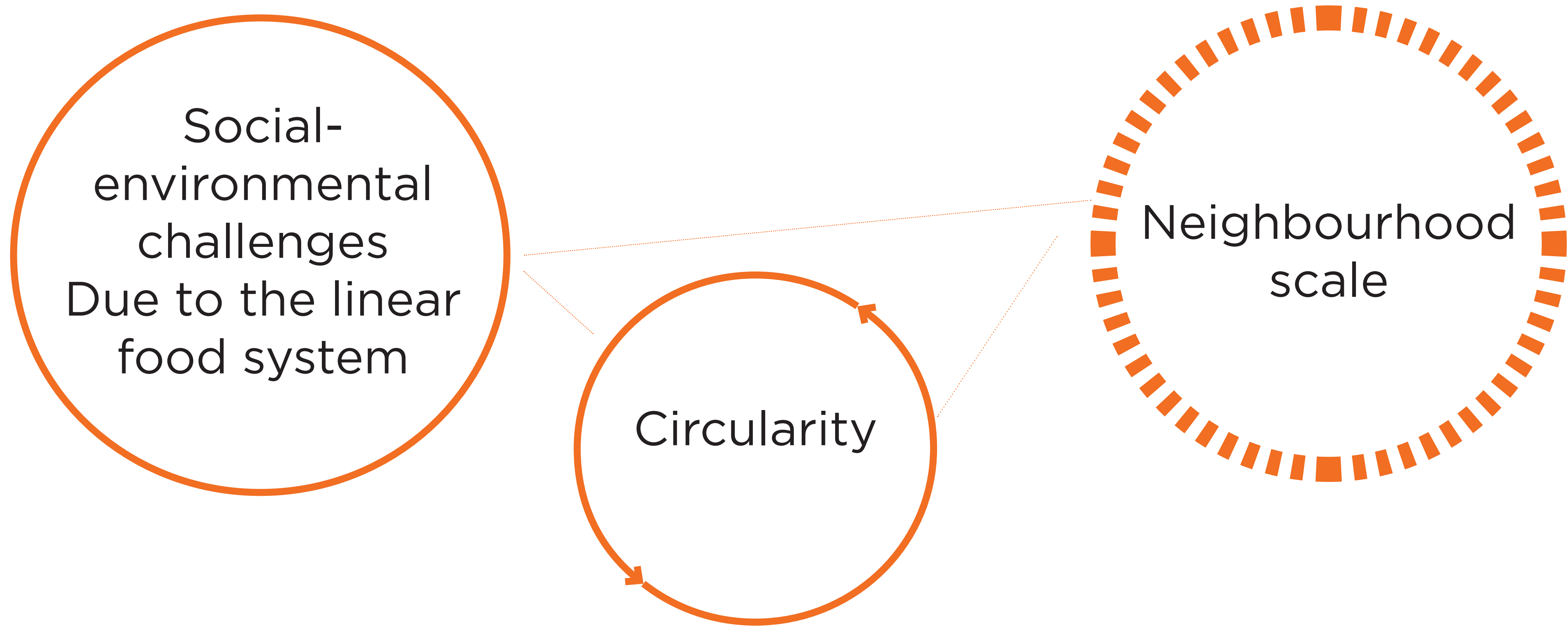
Local food production



Participation



SUMMARY



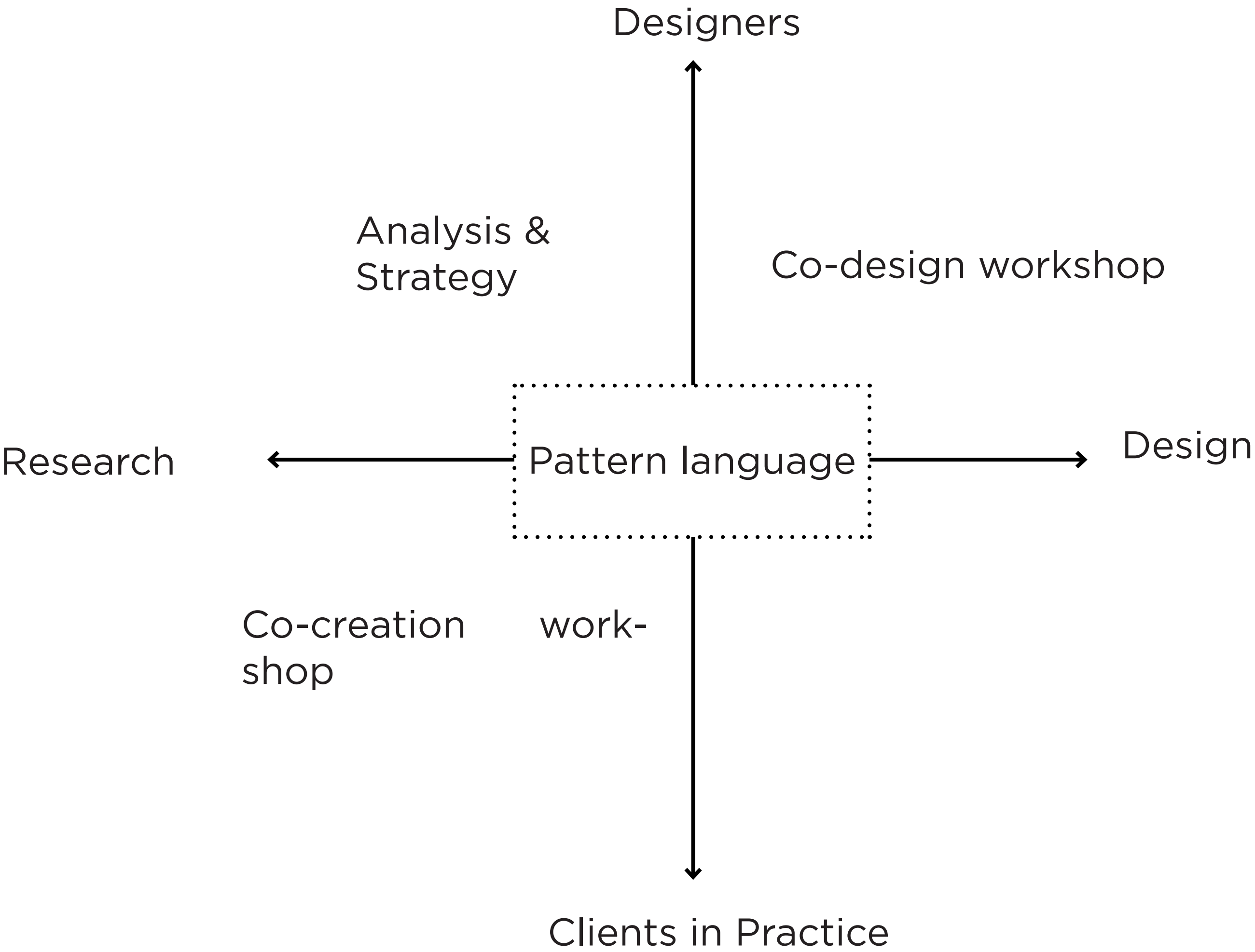
RESEARCH QUESTION

How can the transformation of Dutch post war neighbourhoods facilitate actions of our daily life towards a circular foodscape?

PATTERN LANGUAGE AS CO-CREATION APPROACH

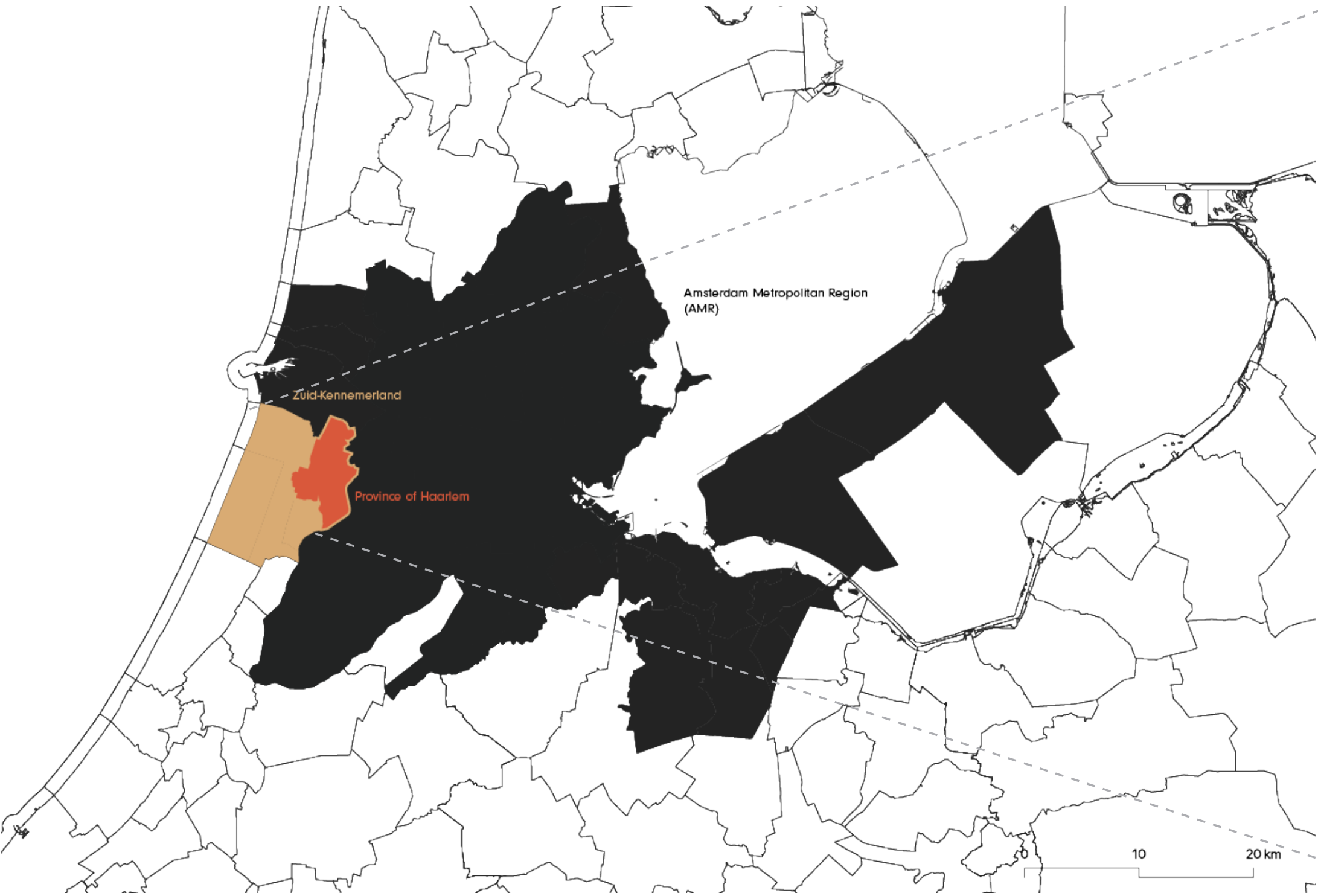
What is pattern language ?

A strategic research by design method where individual interventions are interconnected forming a network.

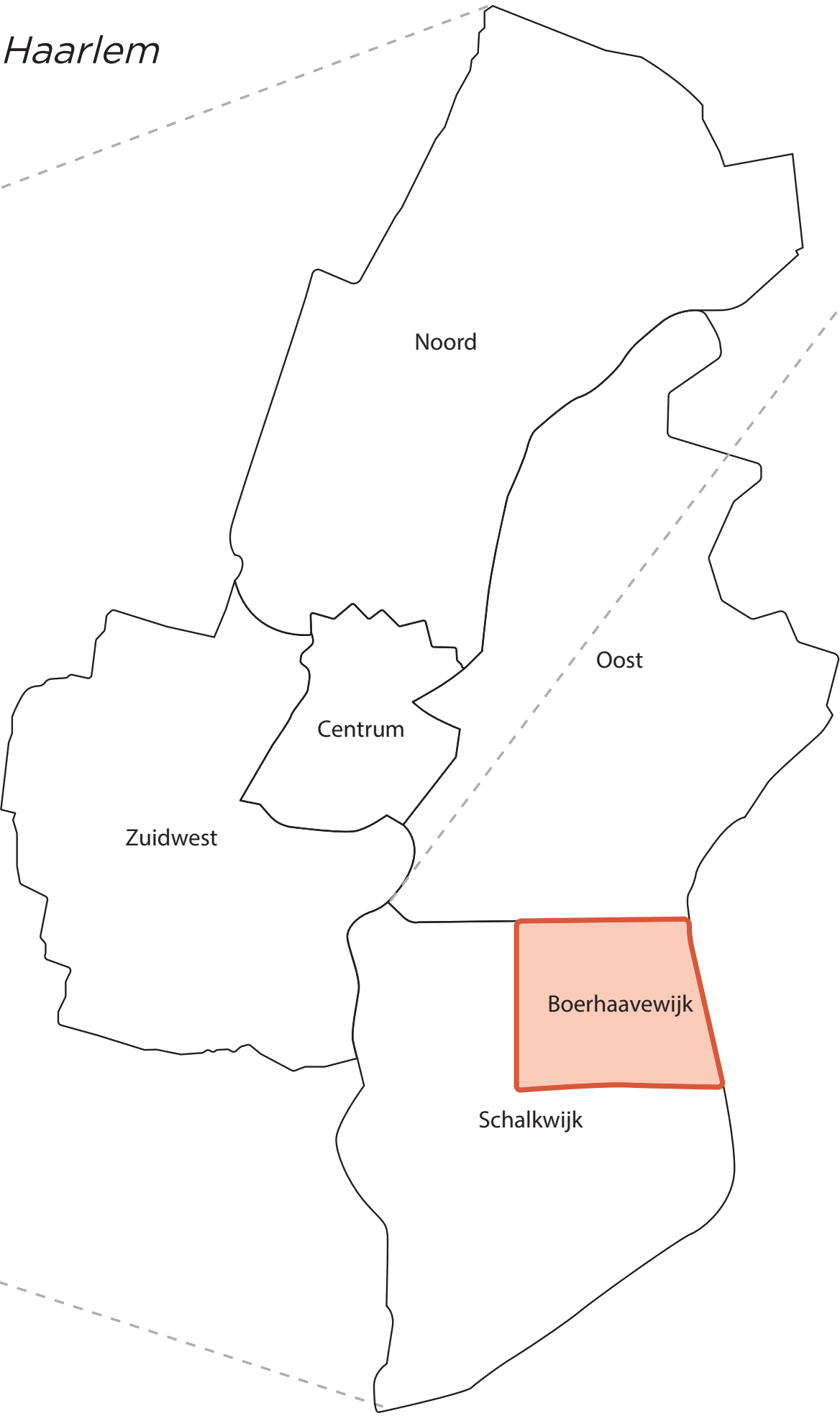


PLACE BASED APPROACH

Amsterdam metropolitan region

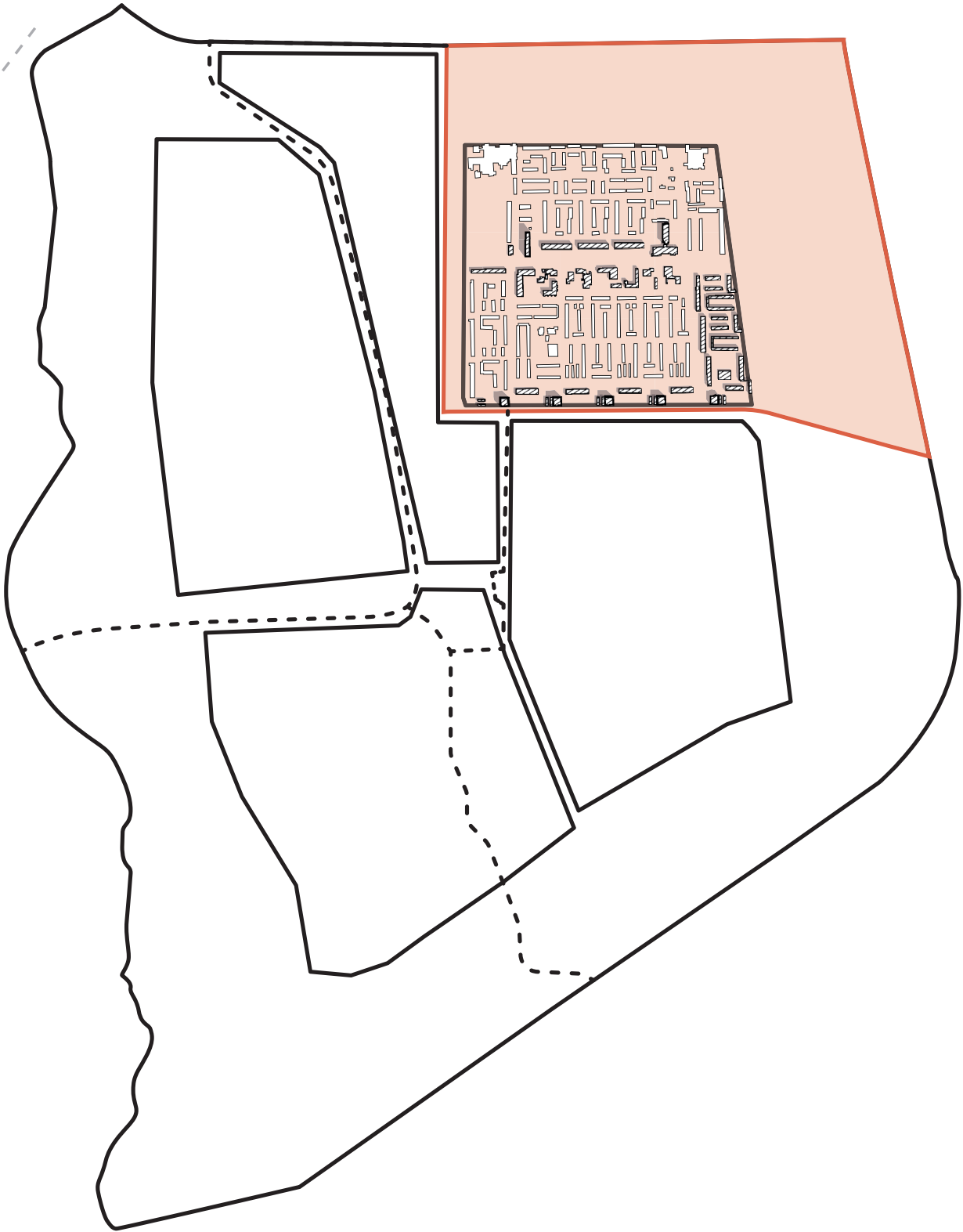


Haarlem



Schalkwijk

Boerhaavewijk



THE CASE



Haarlem city centre

Boerhaavewijk



Schalkwijk Midden

Meerwijk

Europawijk

Molenwijk

33.020 inhabitants in 2017 (CBS)

/ PROBLEM FIELD /

CIRCULAR EVERYDAY FOODSCAPE /

METHODOLOGY /

ANALYSIS /

PATTERN LANGUAGE /

SYSTEMIC SHIFT /

CO-CREATION /

POST WAR NEIGHBOURHOODS



Source: Historic picture, source: <https://boerhaavewijk.nl/fotos/>

/ PROBLEM FIELD

/ CIRCUIT

/ SCENARIO

/ STRATEGY

METHODOLOGY /

ANALYSIS /

PATTERN LANGUAGE /

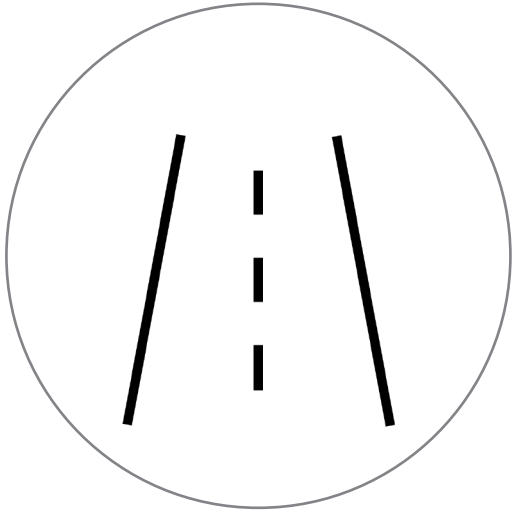
SYSTEMIC SHIFT /

CO-CREATION /

Modernistic planning



Car infrastructure



Social housing



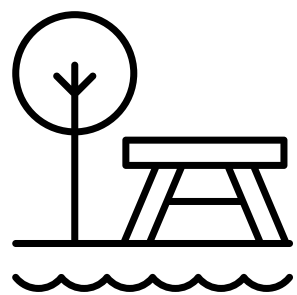
VALUES



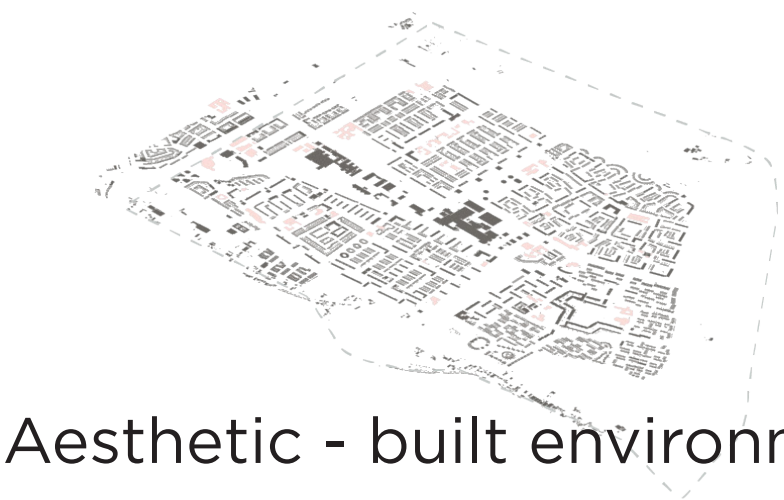
URBAN GARDENING



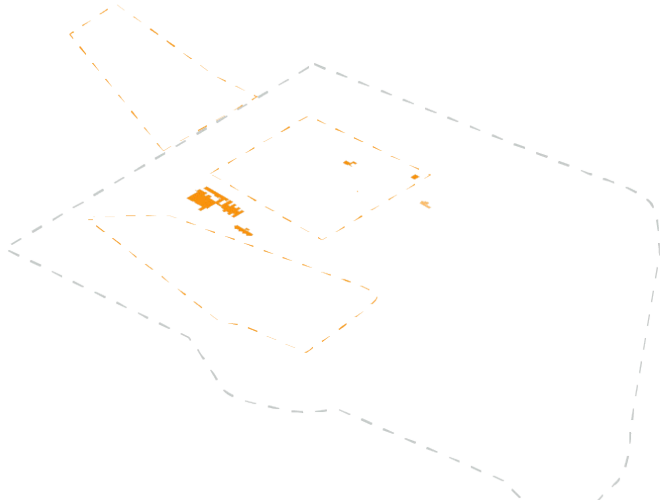
LOCAL SOURCING & EDUCATION



MOLENPLAS-LAKE



Aesthetic - built environment



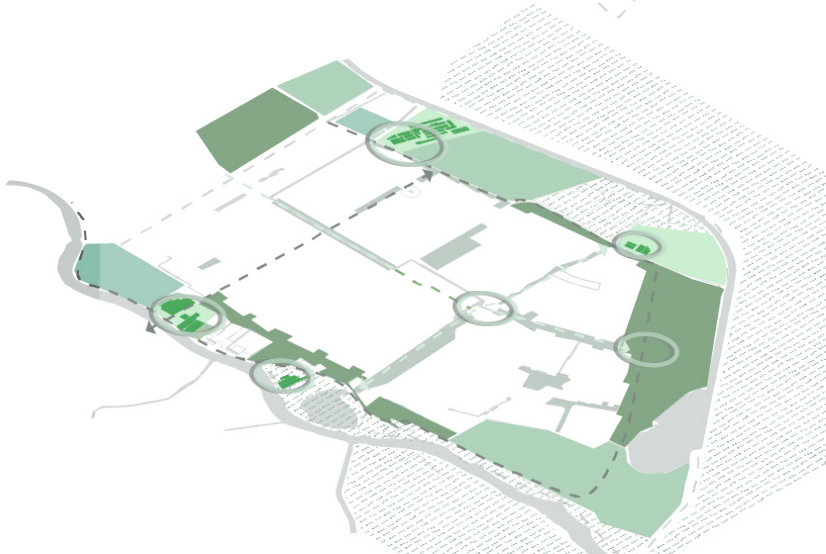
Cultural - architectural value



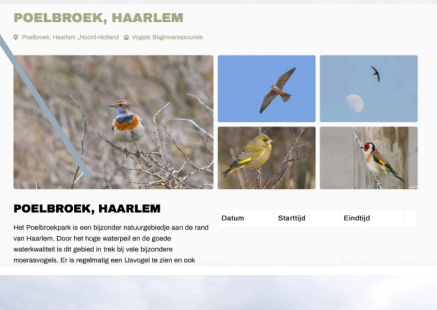
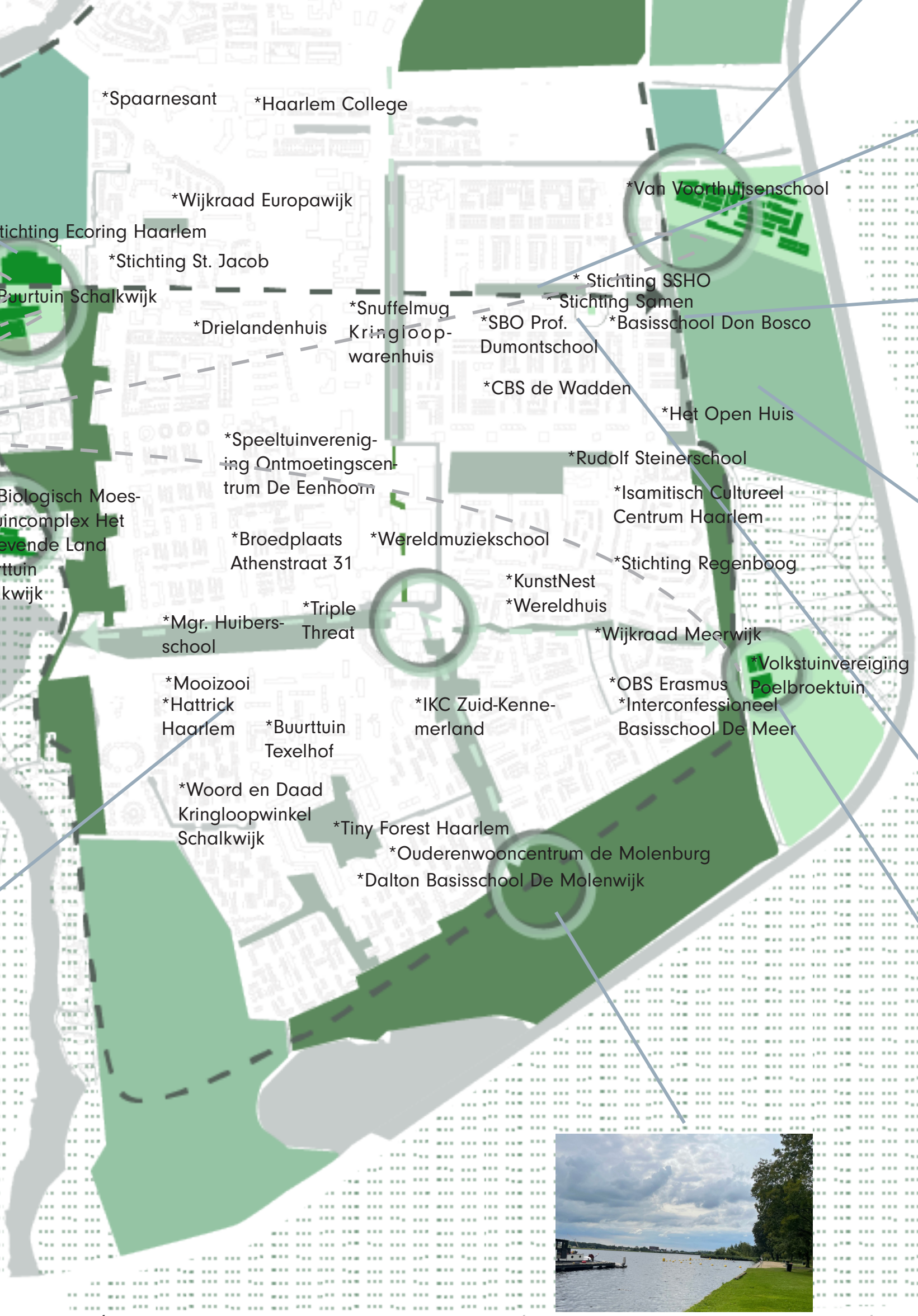
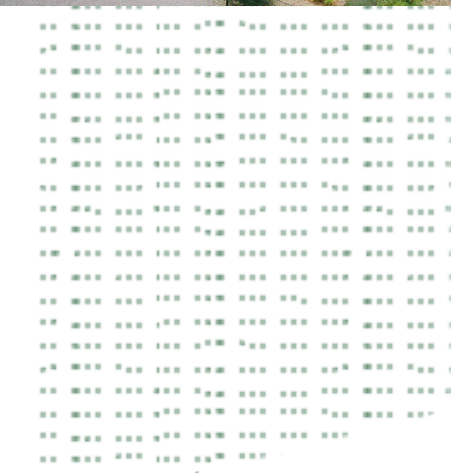
Social - social structures



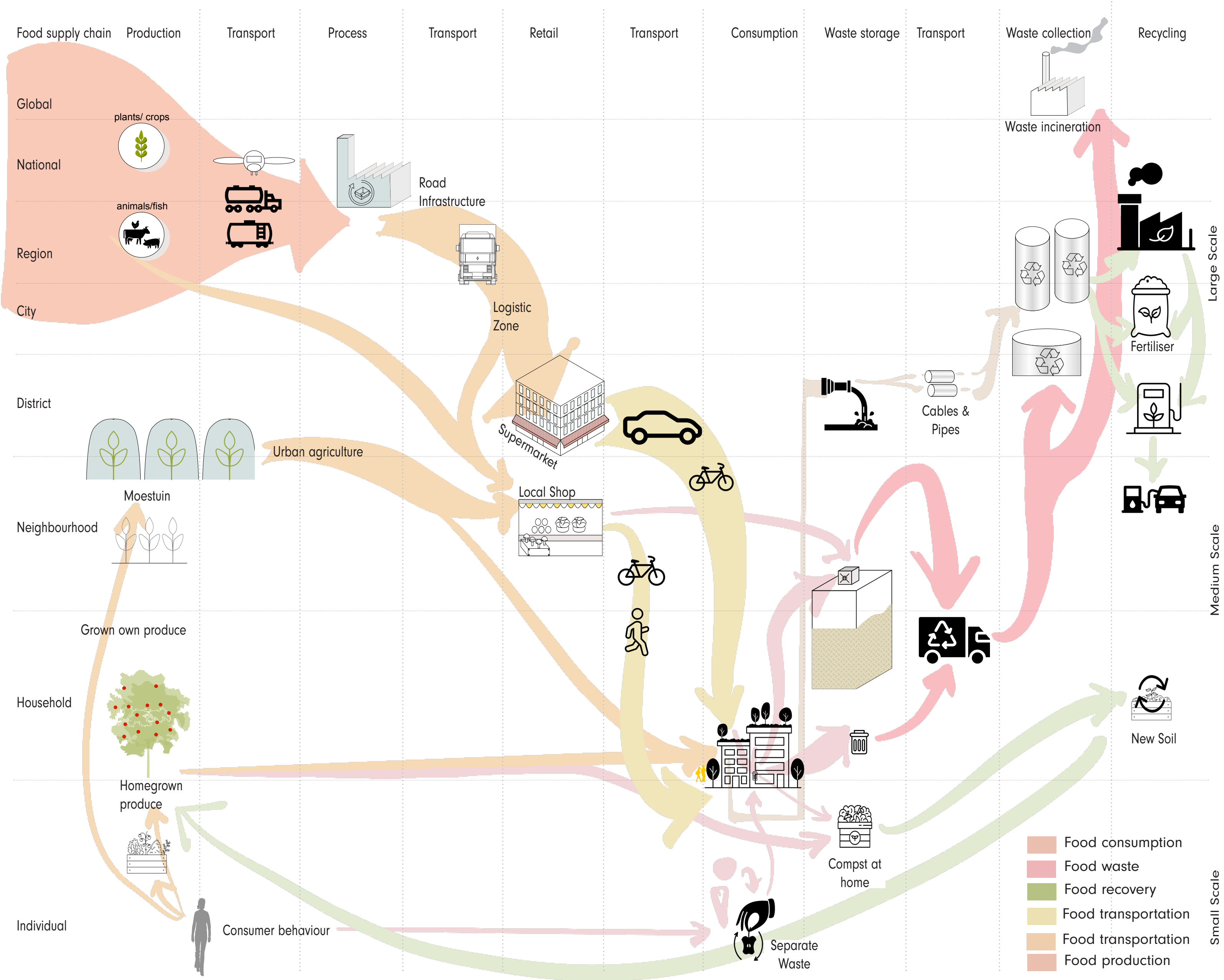
Economic - hotels & shops



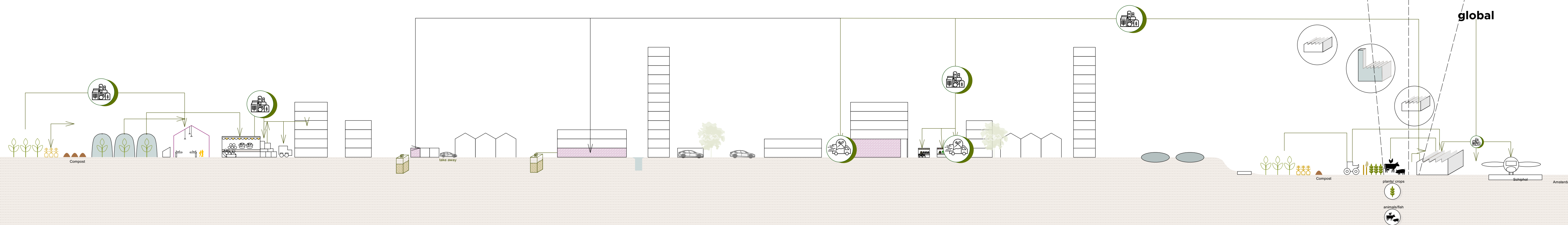
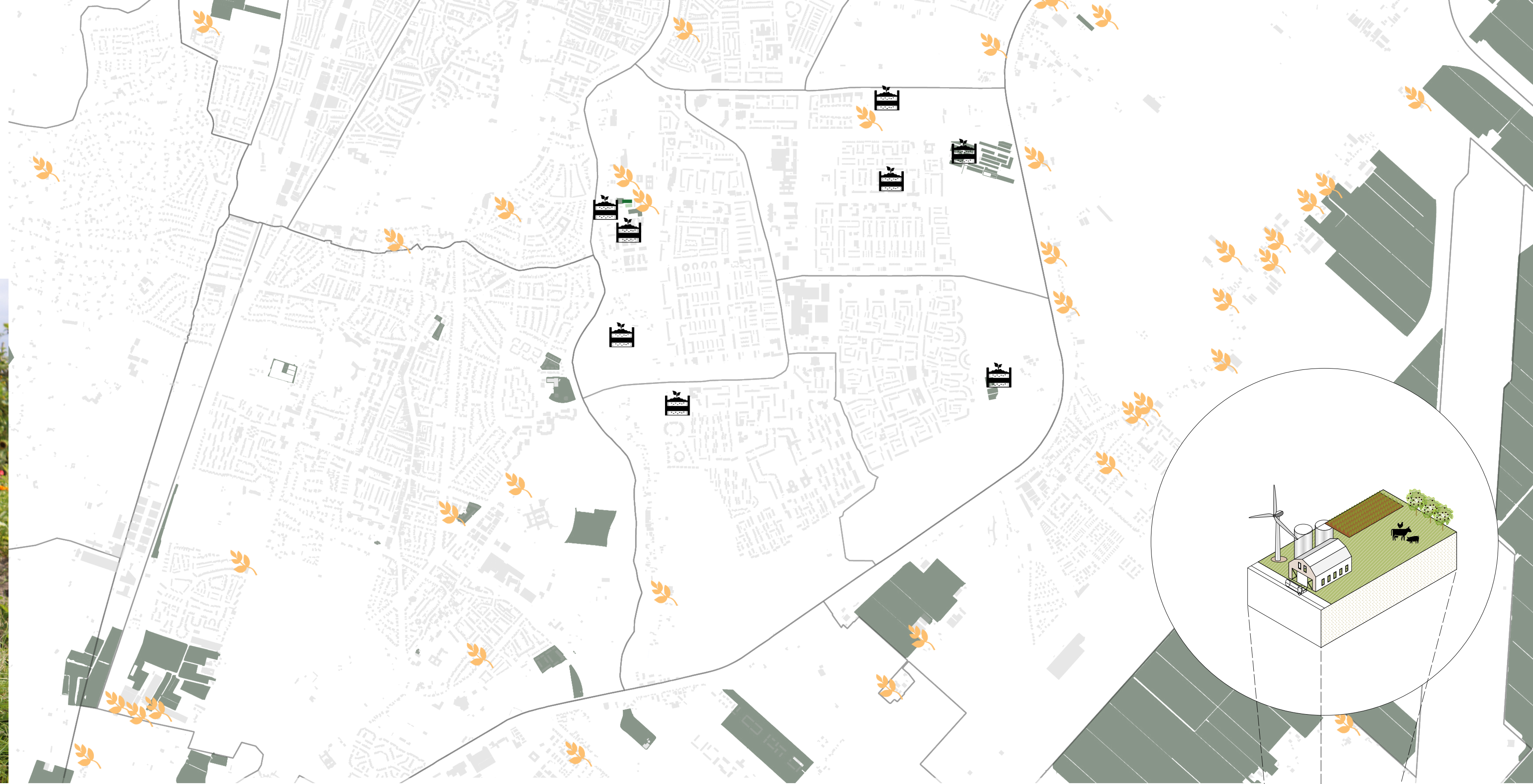
Ecological - green structure



THE FOODSCAPE ON EYE LEVEL

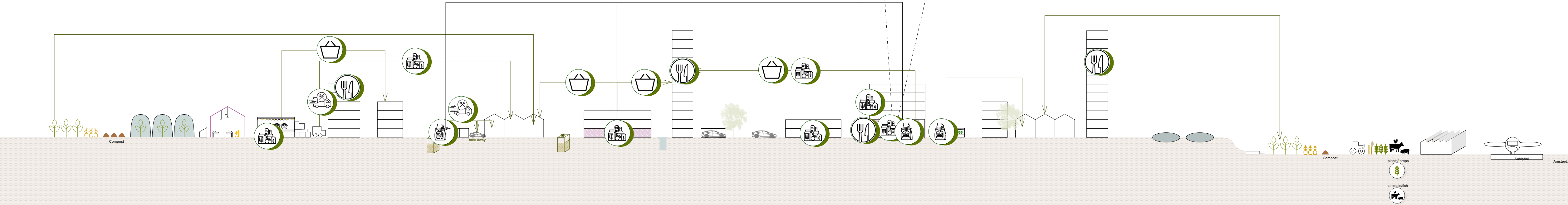
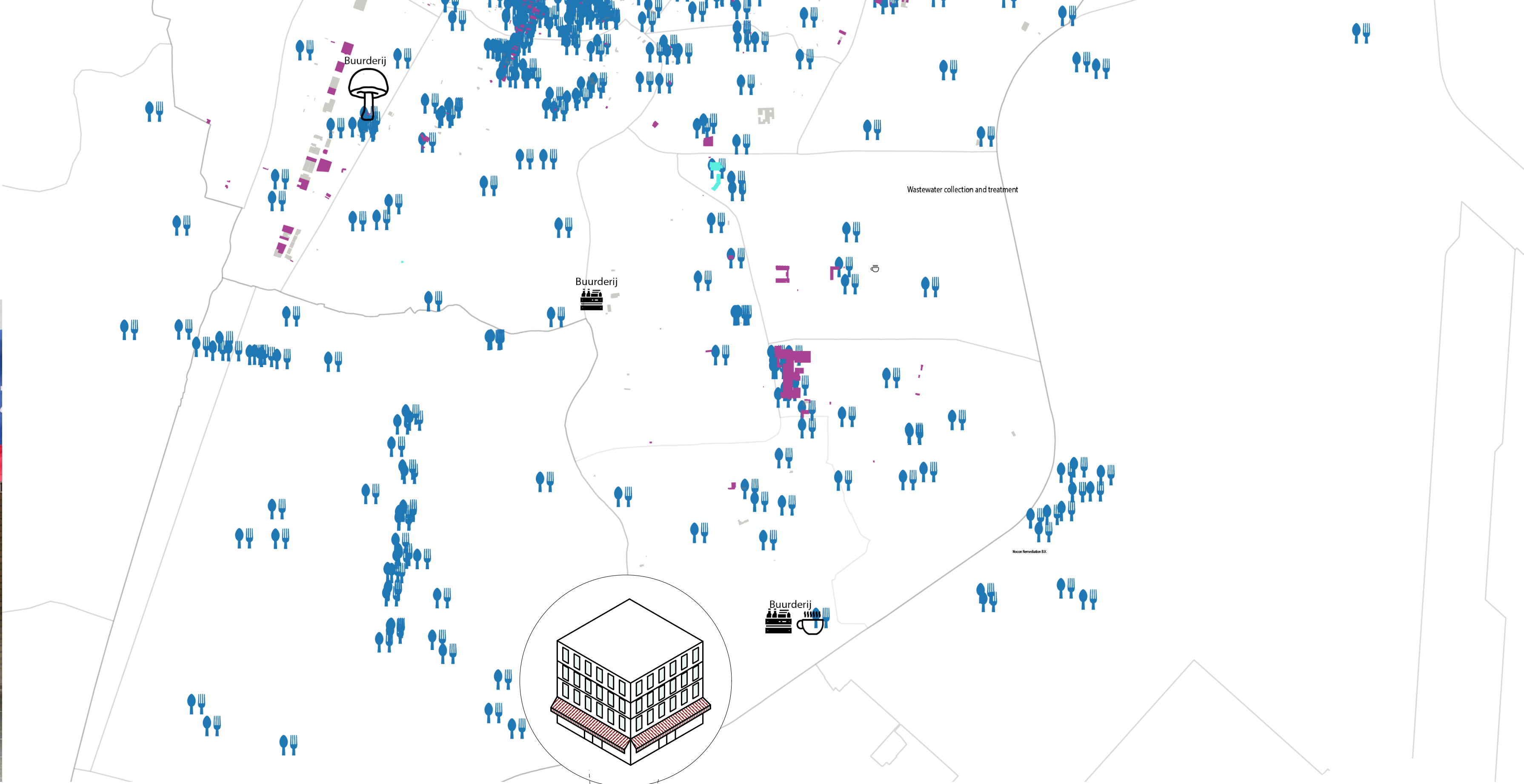


A photograph of a garden bed. In the foreground, there are several plants with large, rounded, purple-tinged leaves. Behind them, a black plastic mulch is visible. In the background, a large field of yellow flowers, possibly marigolds, is growing. A green mesh fence is visible on the left side of the field. The sky is blue with some clouds.

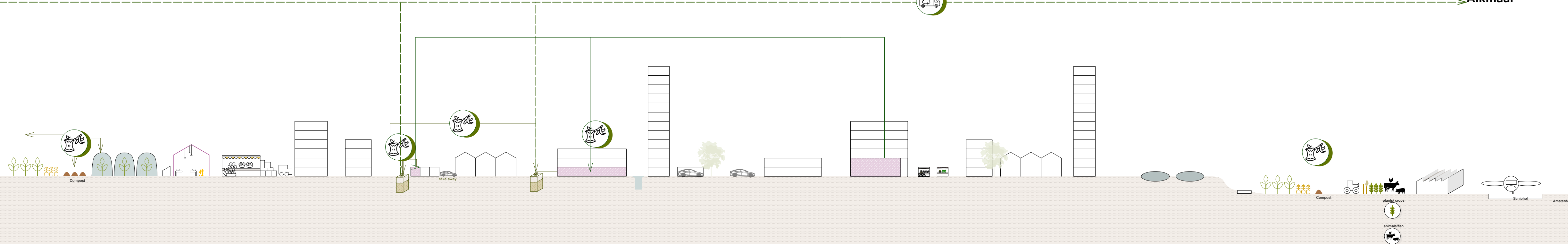
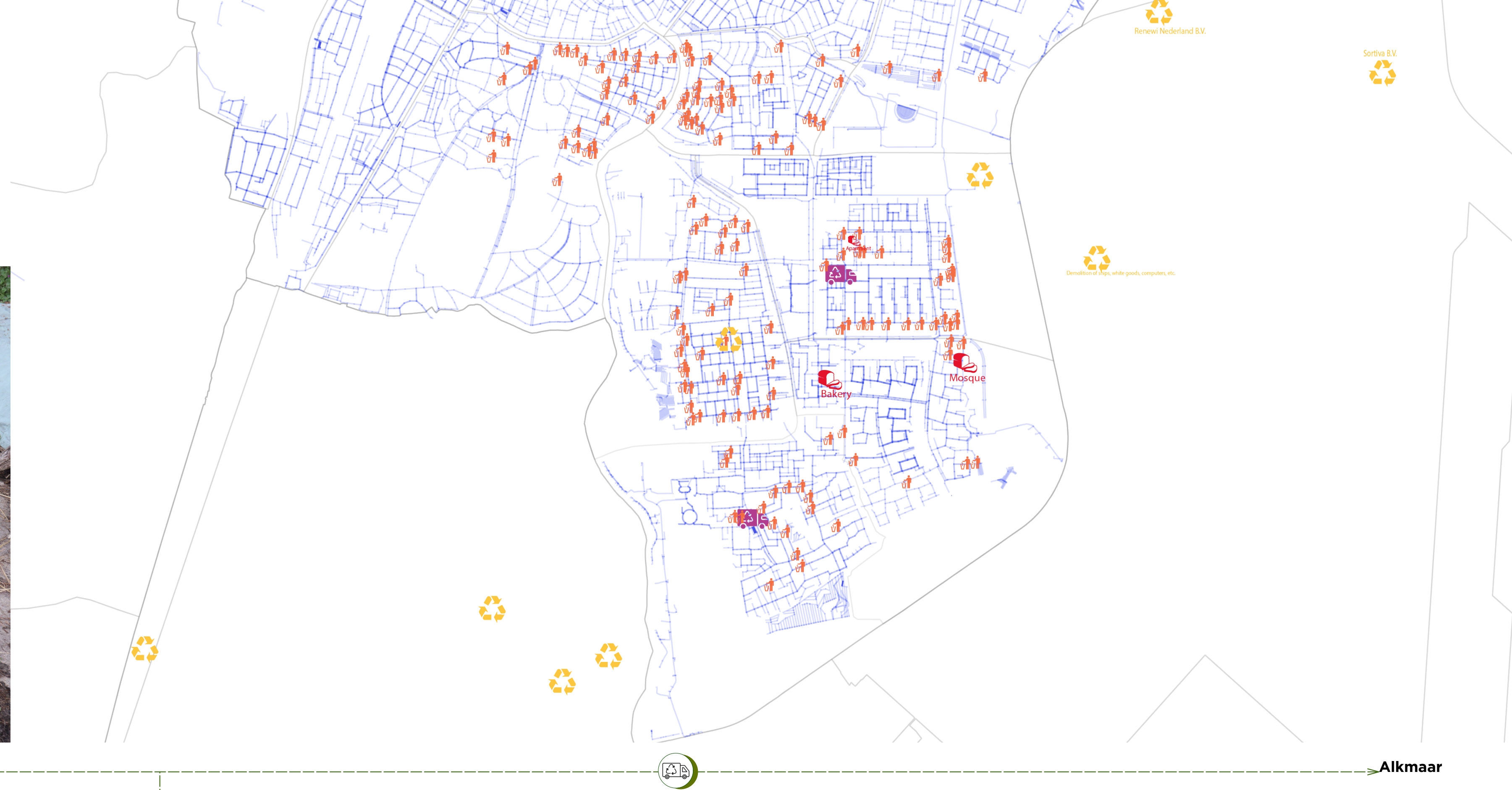


THE FOOD SYSTEM

- CONSUMPTION

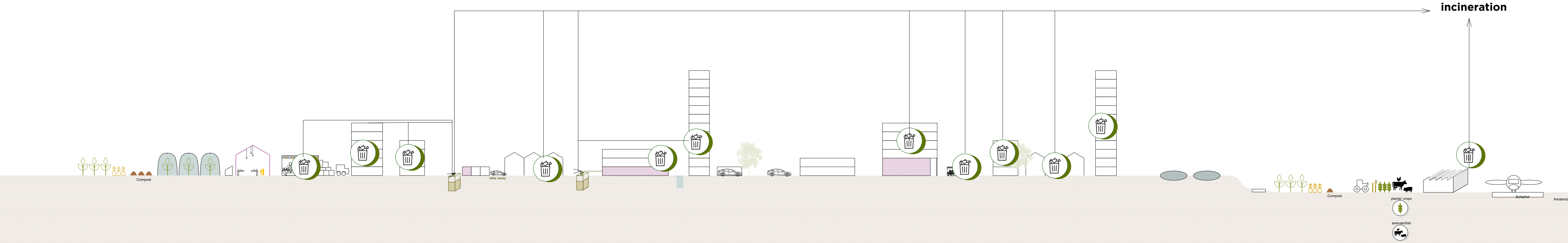
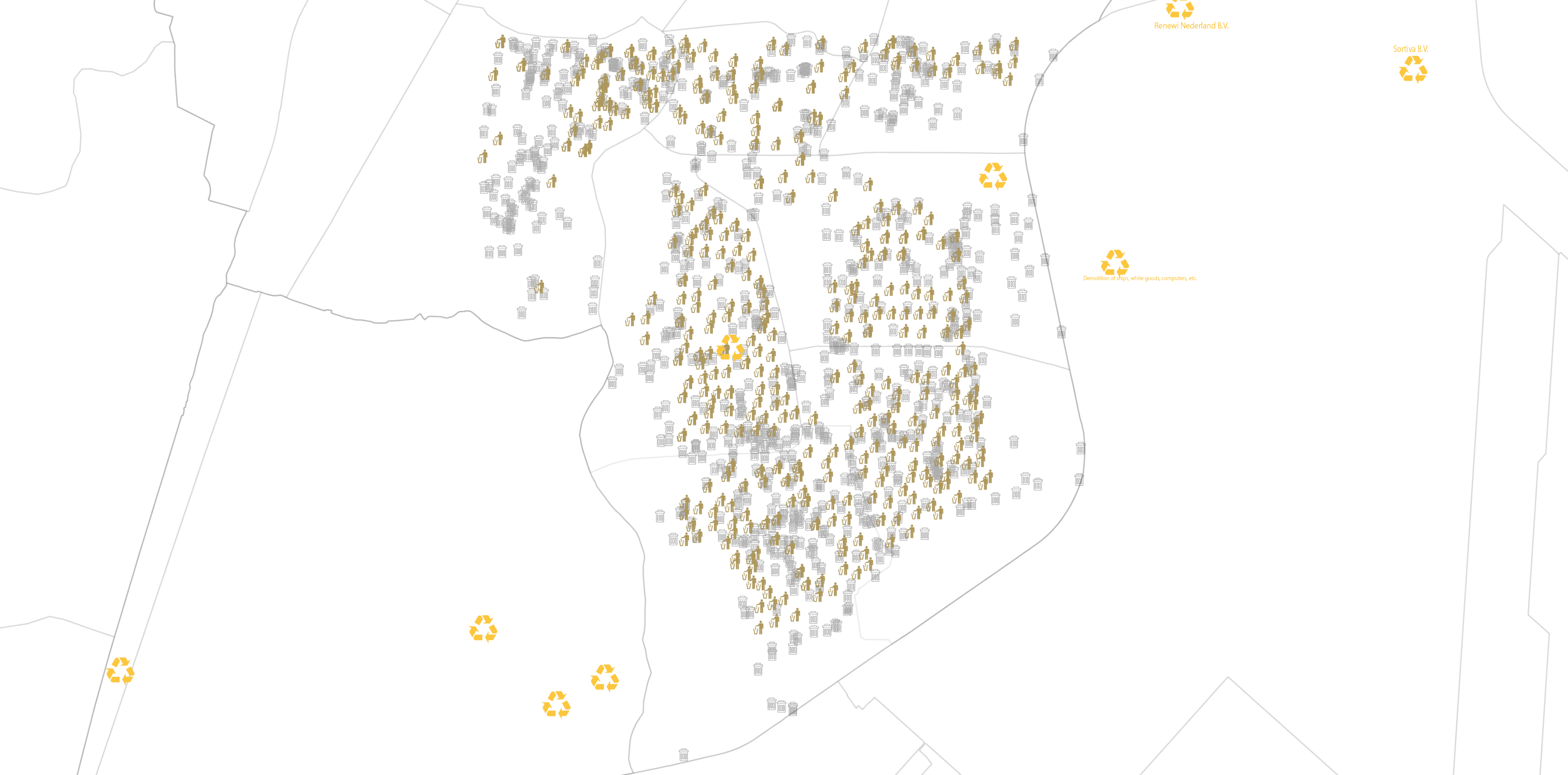


- REGENERATING



THE FOOD SYSTEM

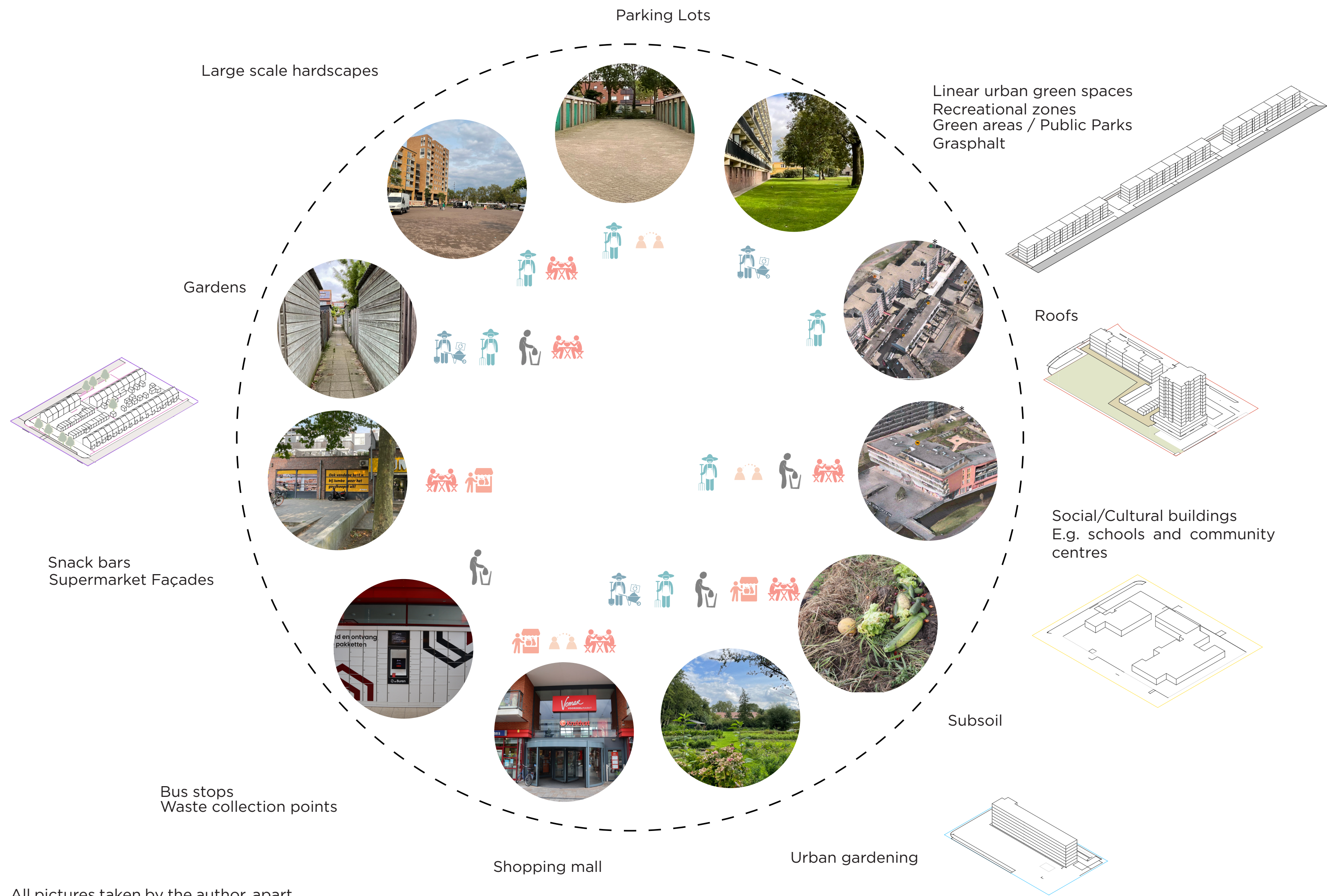
- WASTING



CIRCULAR ACTIONS IN SCHALKWIJK



RELEVANT SPACES FOR CIRCULAR EVERYDAY FOODSCAPE



All pictures taken by the author, apart the ones marked with a * . source: apple maps

THE CURRENT FOODSCAPE IN SCHALKWIJK...

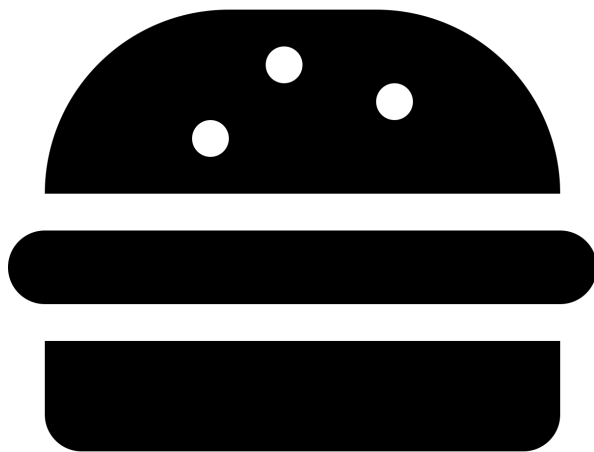
OPPORTUNITY IN BIODIVERSITY



FOOD WASTE



FOOD DESERT

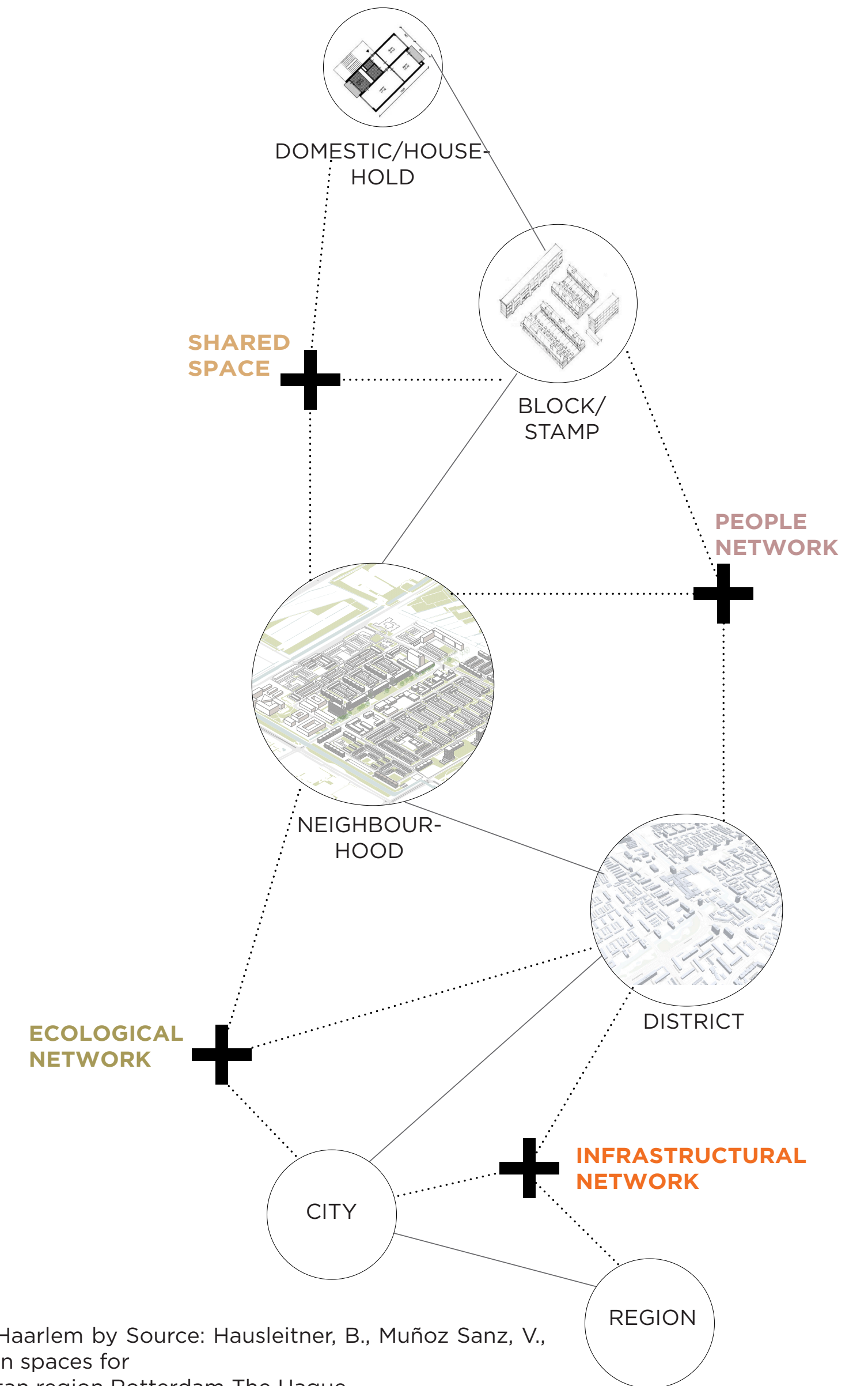
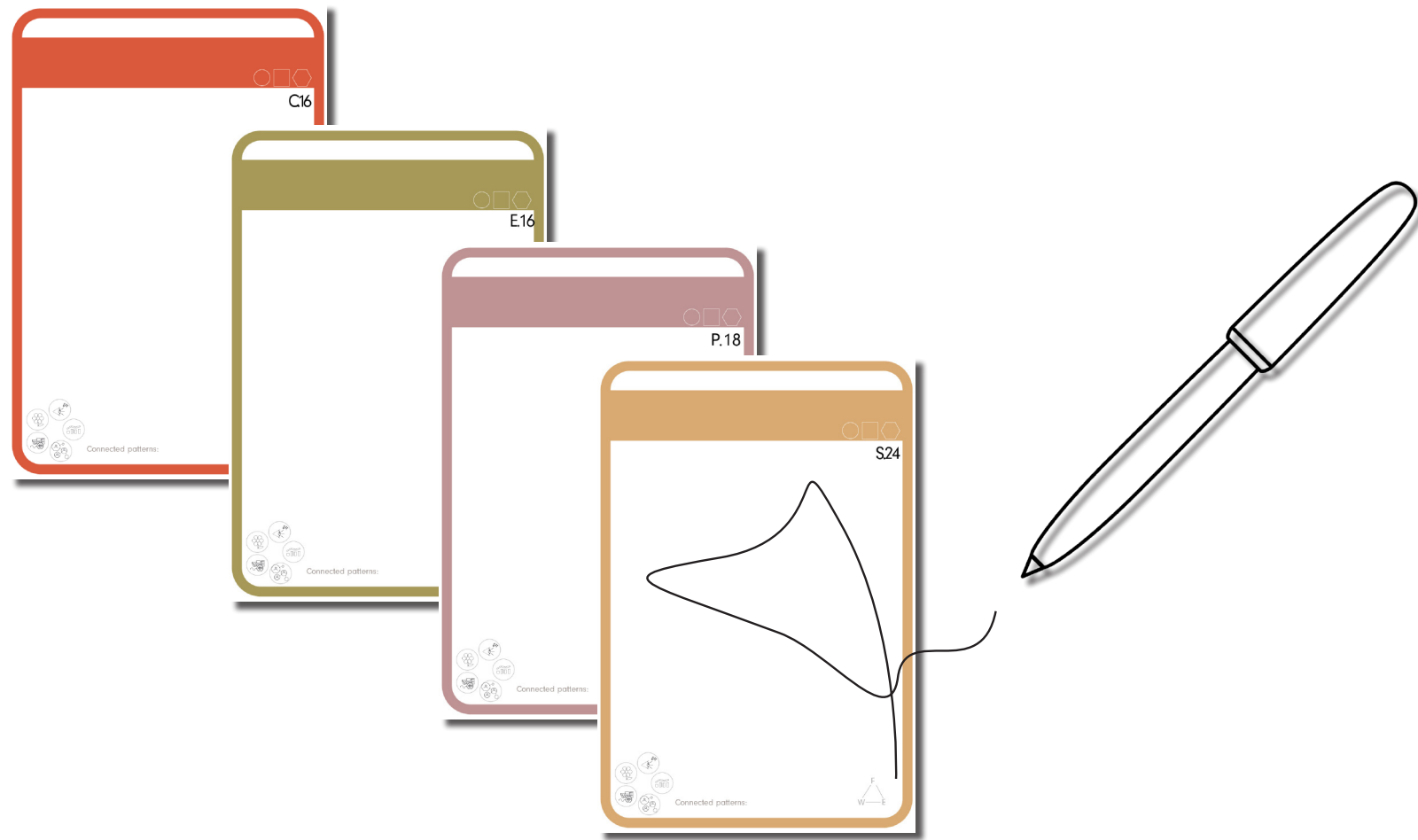


THE CIRCULAR FOODSCAPE IN SCHALKWIJK...



PATTERN LANGUAGE AS CO-CREATION APPROACH

1. Focus on human-centred design
2. Adaptability and flexibility
3. Systemic design approach



Graph adapted to this case in Haarlem by Source: Hausleitner, B., Muñoz Sanz, V., Meyer, H. (2021) Emerging urban spaces for manufacturing. Case metropolitan region Rotterdam-The Hague.

CATEGORIES OF PATTERN LANGUAGE

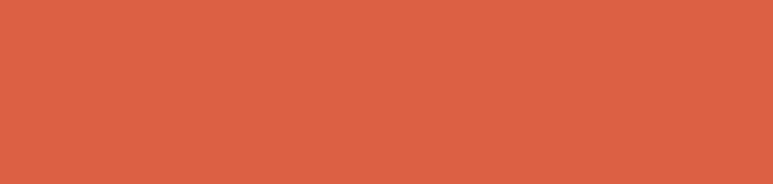
Ecological Network



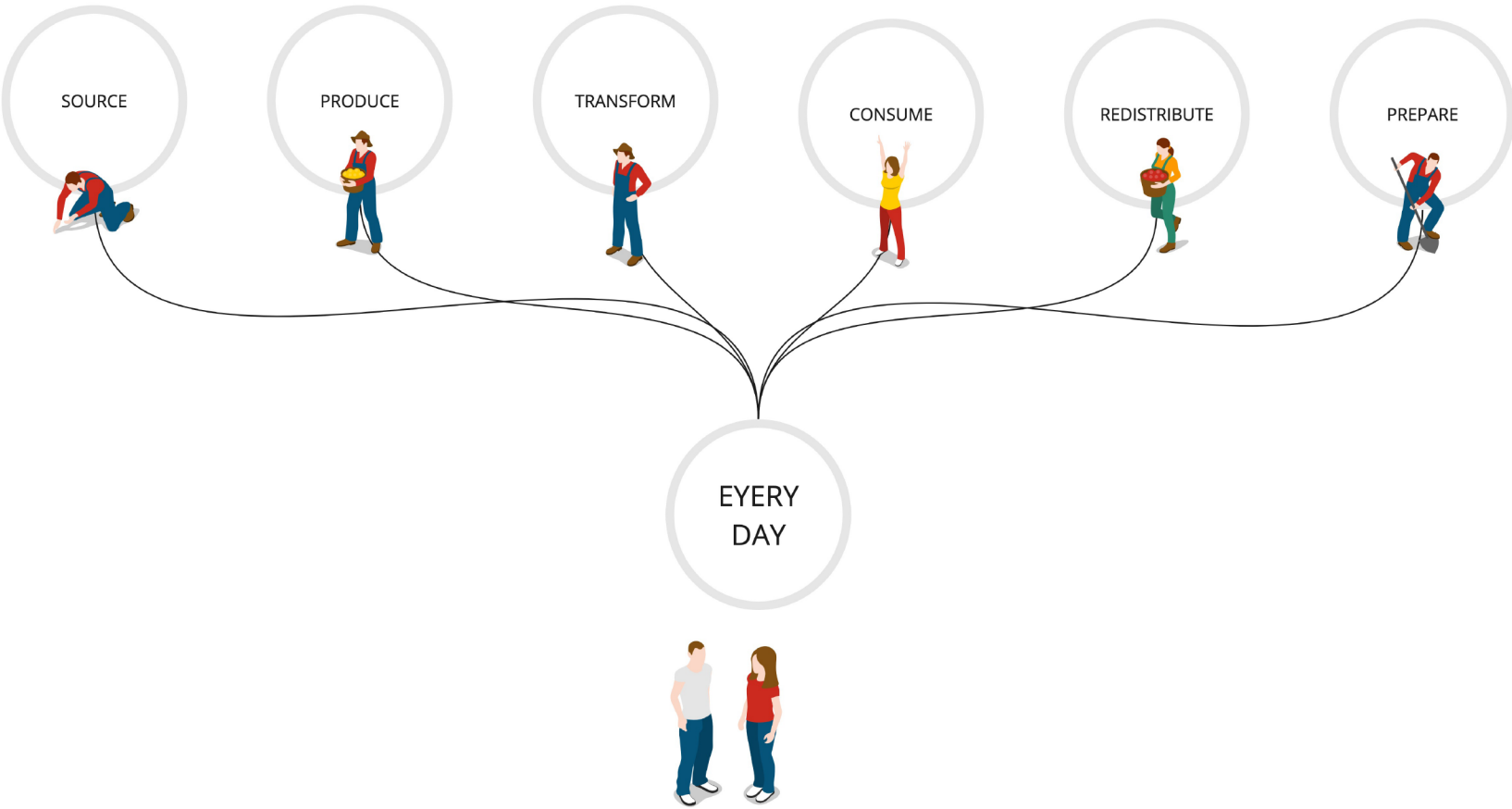
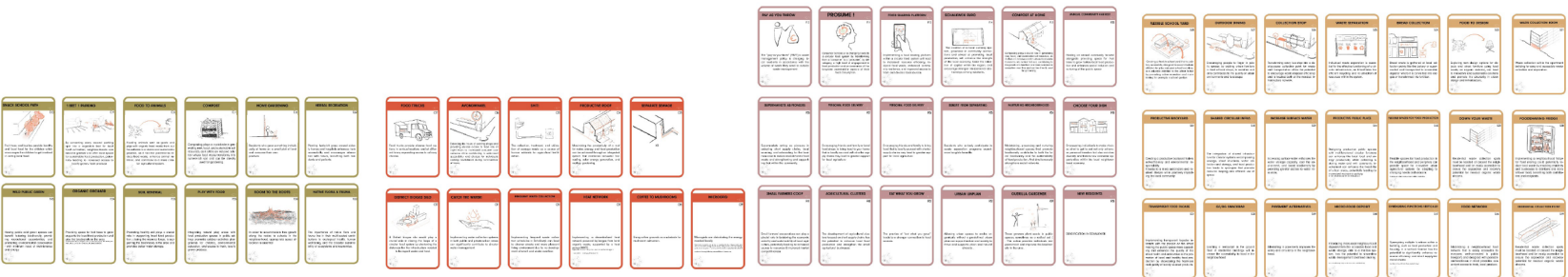
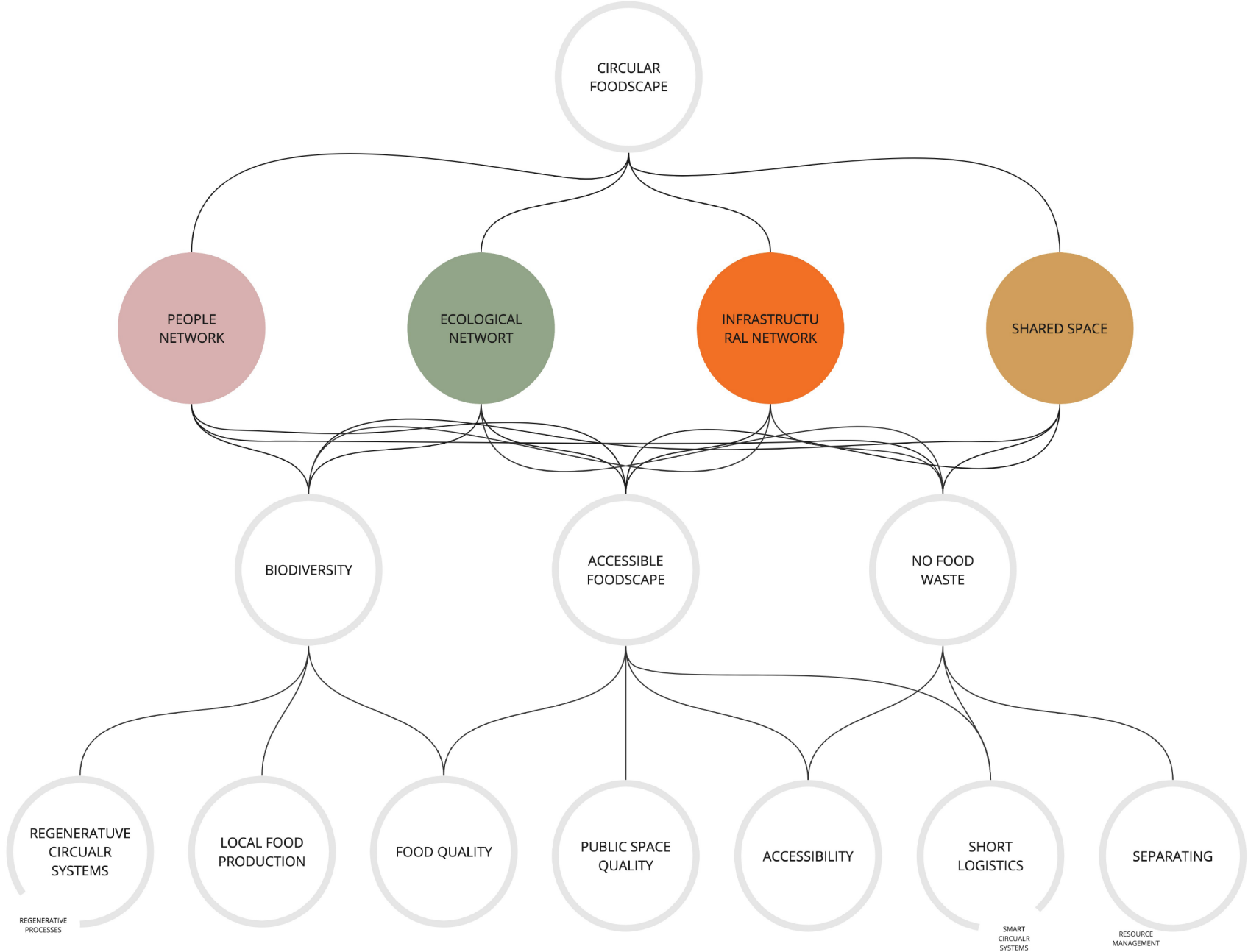
People Network



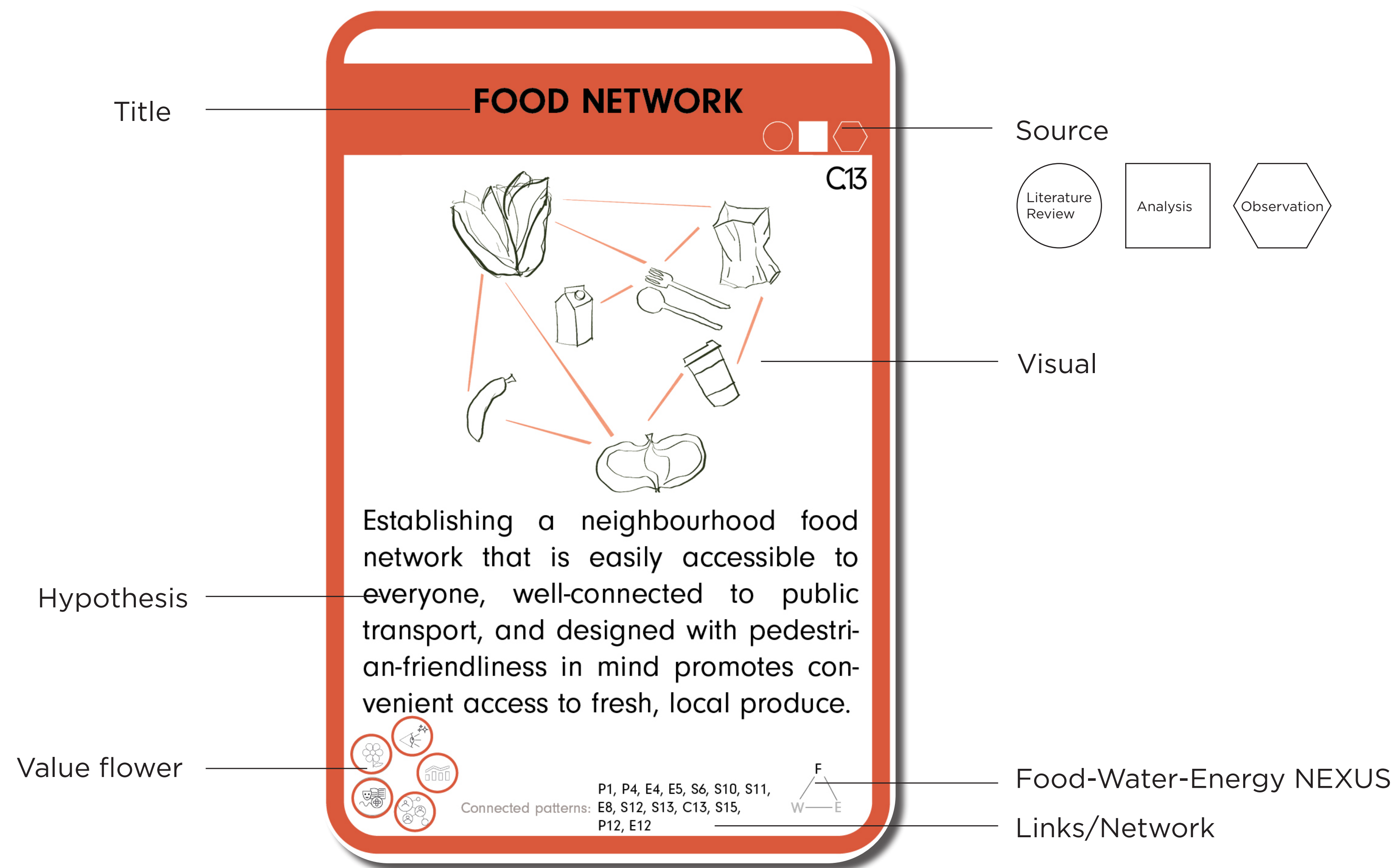
Infrastructural Network



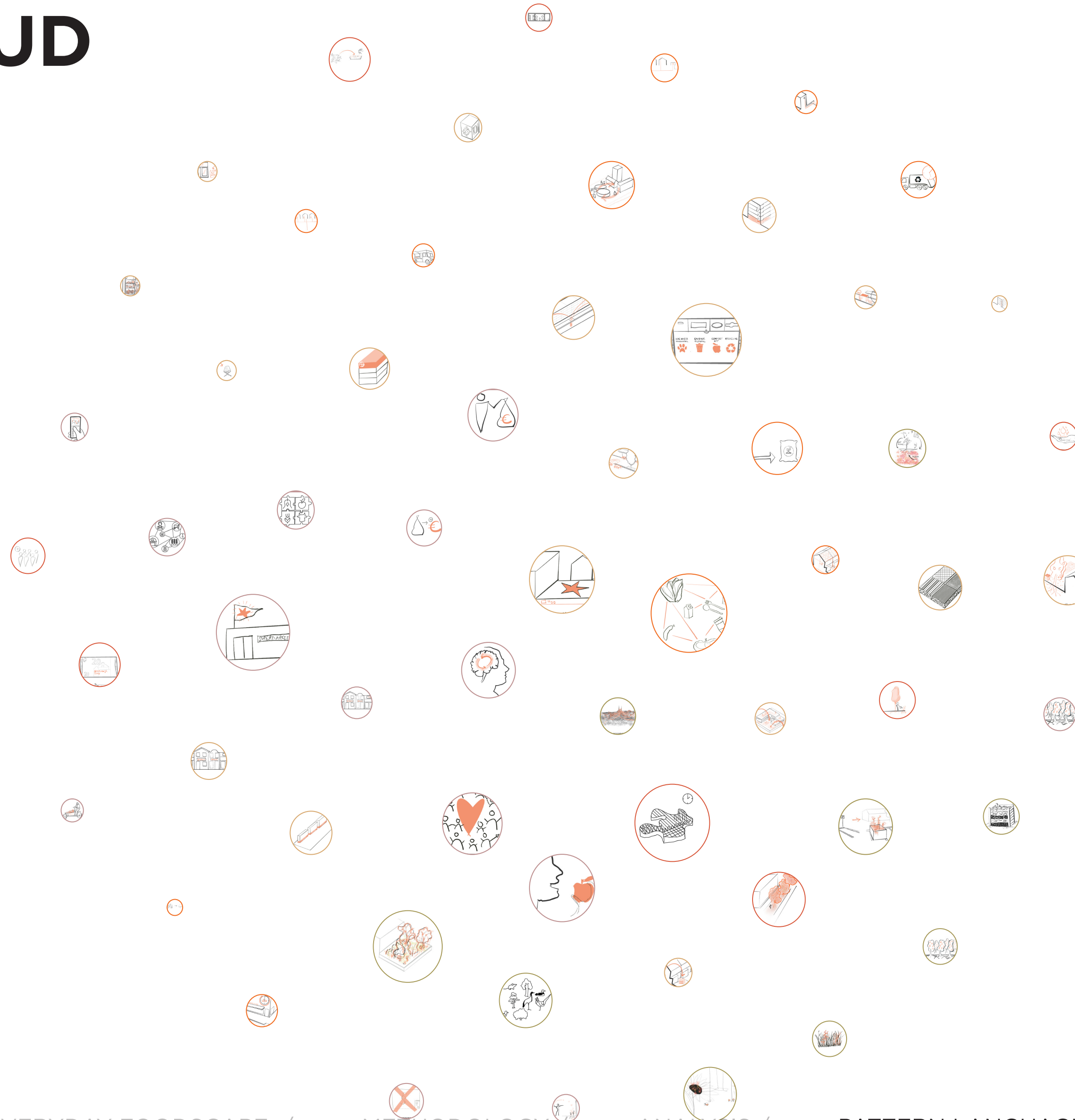
Shared Space



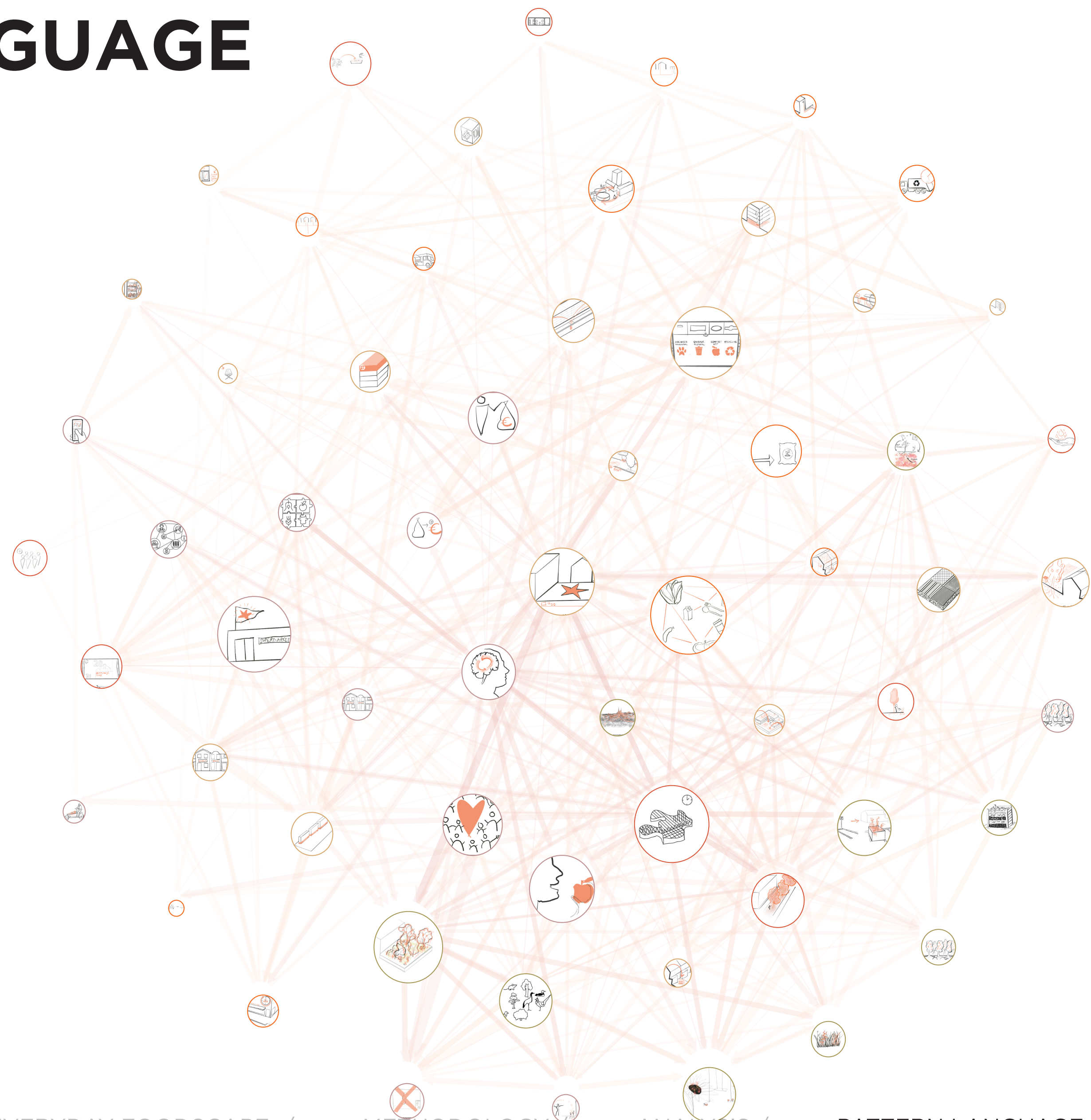
A PATTERN CARD



PATTERN CLOUD



PATTERN LANGUAGE

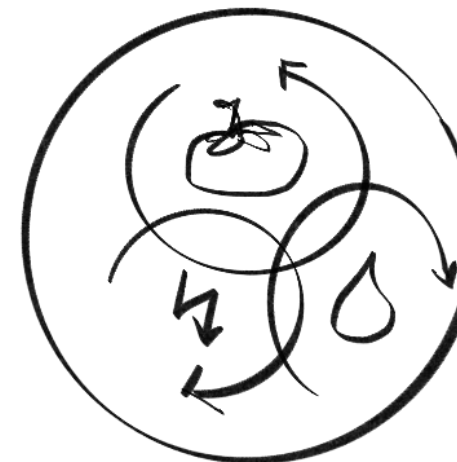


PATTERN LANGUAGE FOR THE SHIFT

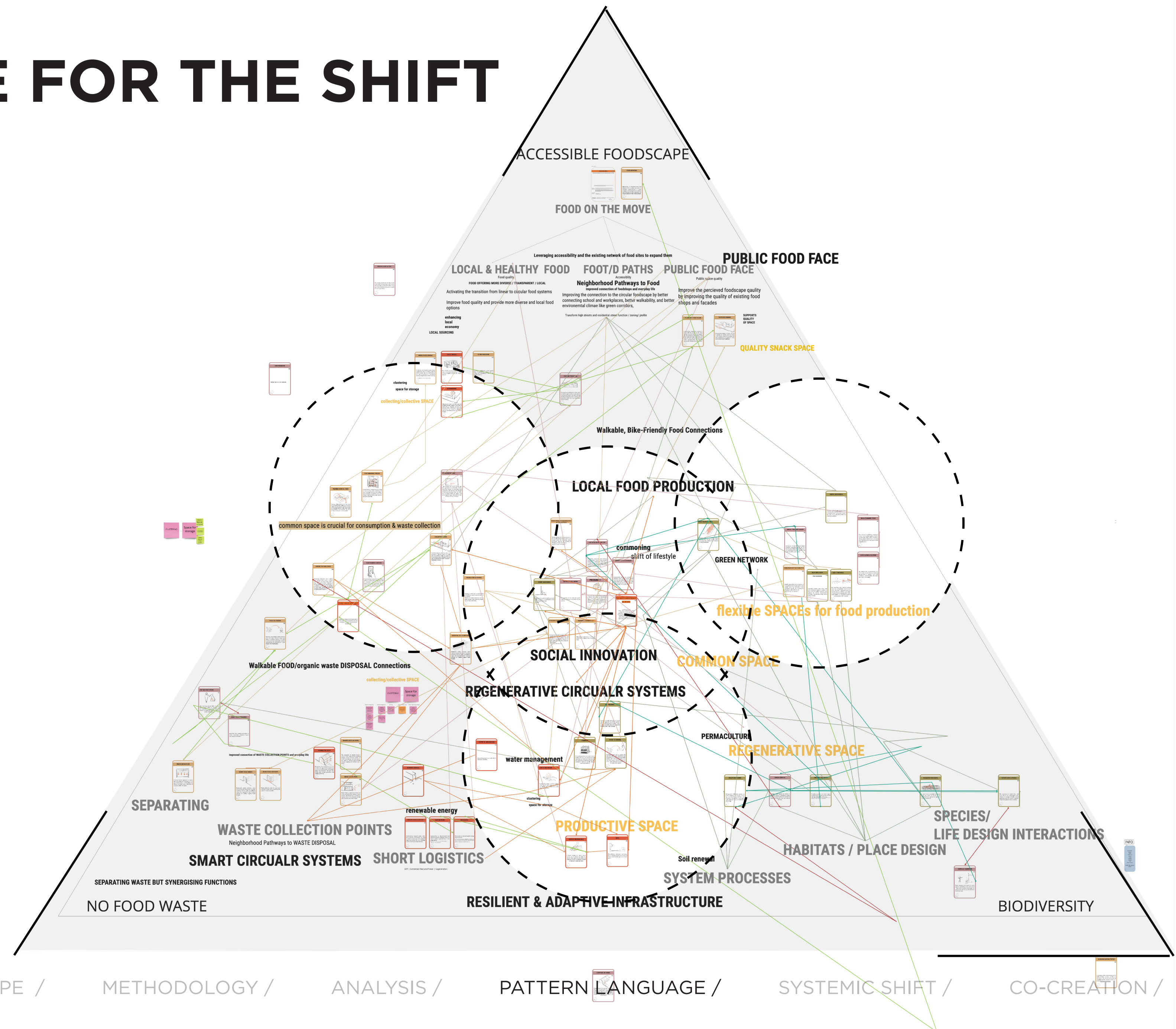
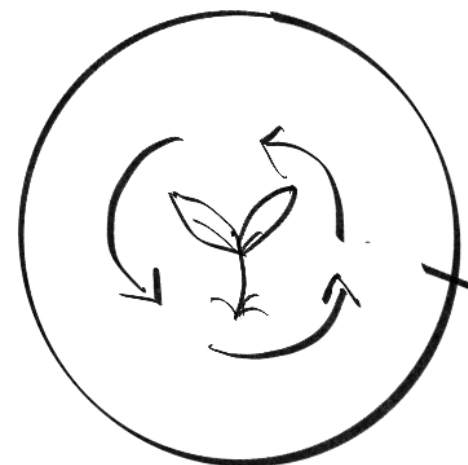
BIODIVERSITY



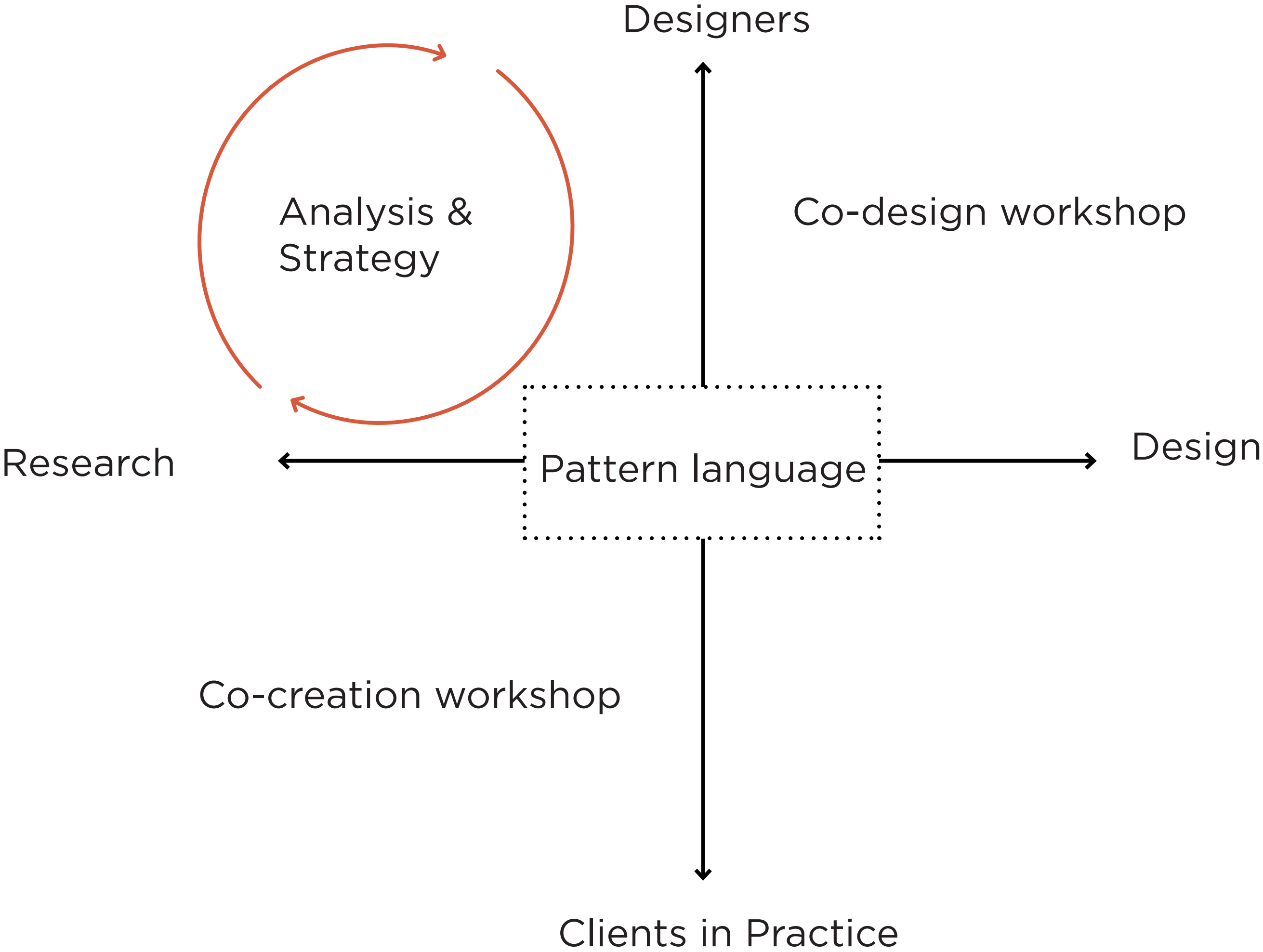
NO FOOD WASTE



ACCESSIBLE FOODSCAPE

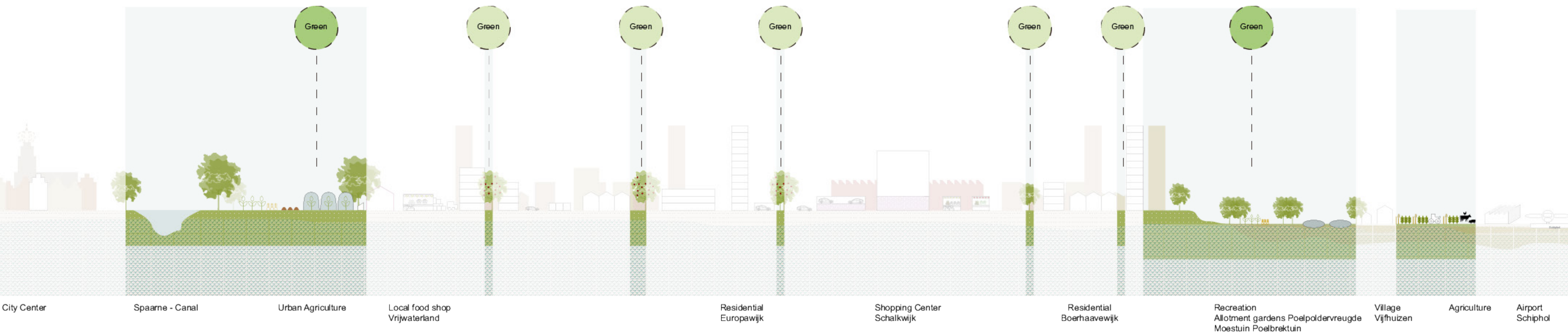


PATTERN LANGUAGE AS STRATEGIC APPROACH



SYSTEMIC SHIFT

The circular foodscape in Schalkwijk...
... provides necessary ecological diversity and resources to support local food production



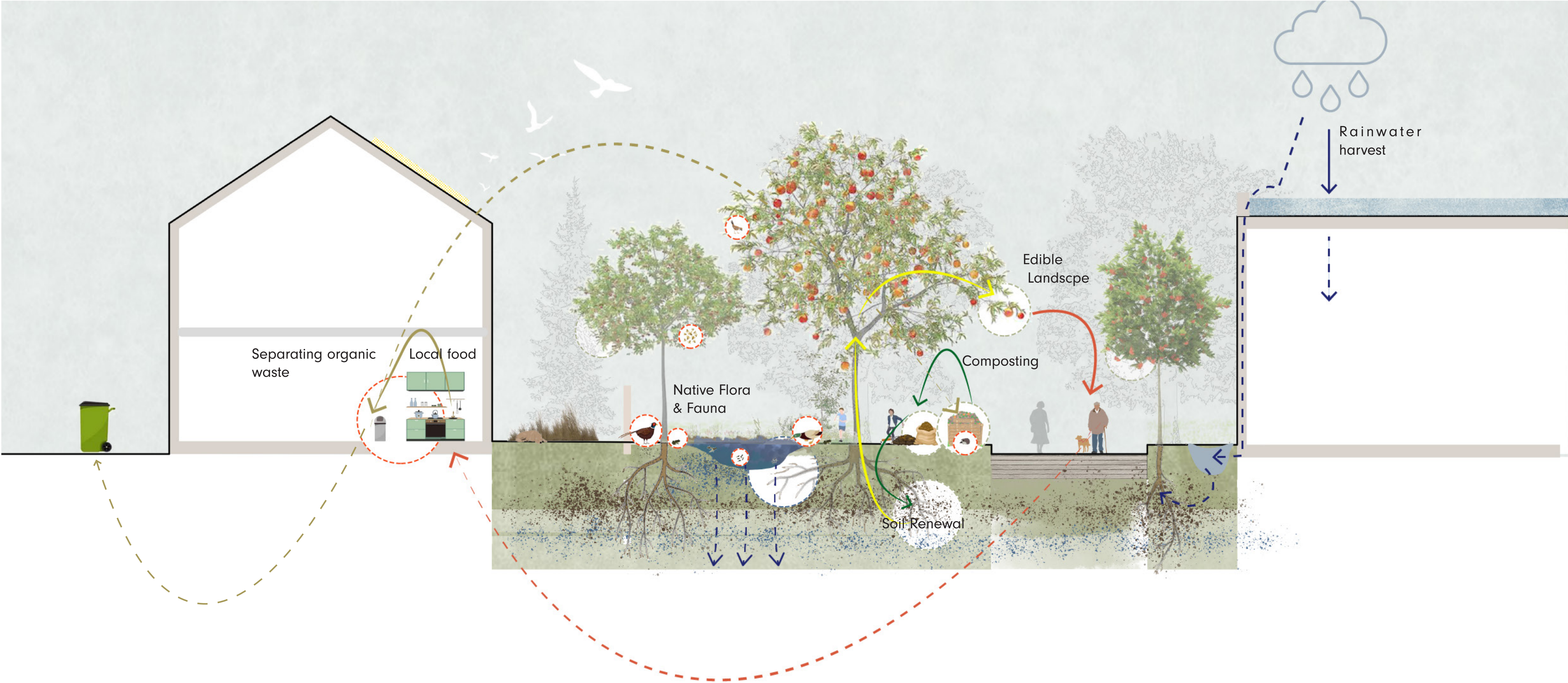
CURRENT SITUATION SYSTEMIC SECTION ECOSYSTEM

... provides necessary ecological diversity and resources to support local food production



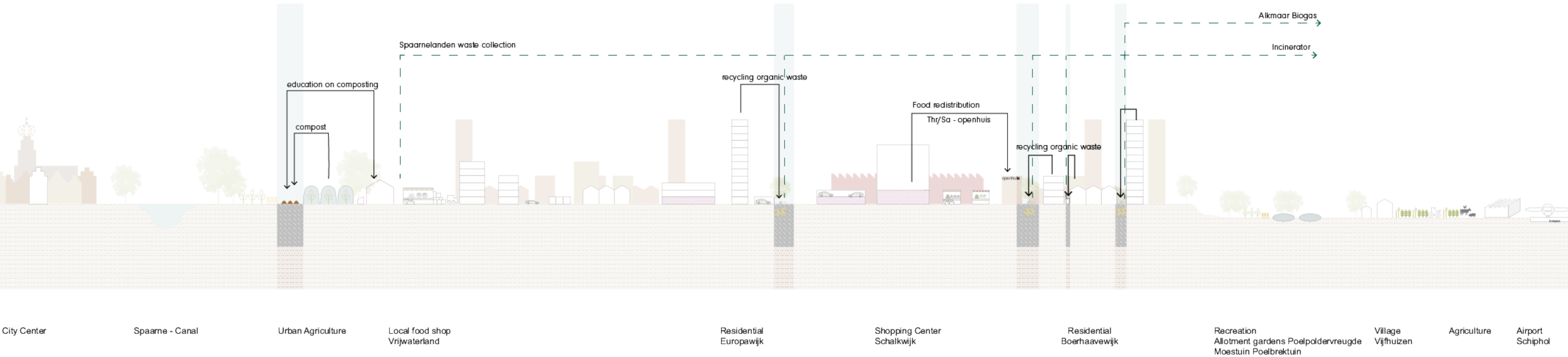
NUTRIENT CYCLE

Section of the secondary green structure in Boerhaavewijk



SYSTEMIC SHIFT

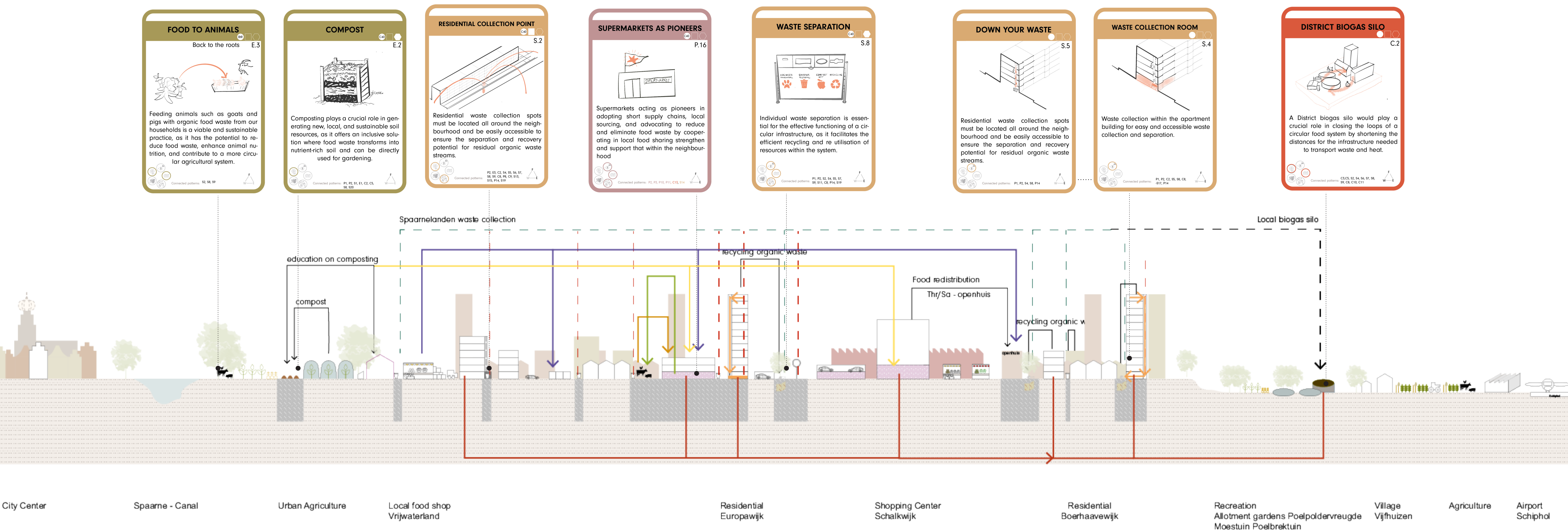
The circular foodscope in Schalkwijk...
... has an infrastructure network that collects the organic waste to provide then renewable heat and energy to the residents in the neighbourhood and therefore is closing loops in small scale.



CURRENT SITUATION SYSTEMIC SECTION

SYSTEMIC SHIFT

The circular foodscape in Schalkwijk...
... has an infrastructure network that collects the organic waste to provide then renewable heat and energy to the residents in the neighbourhood and therefore is closing loops in small scale.

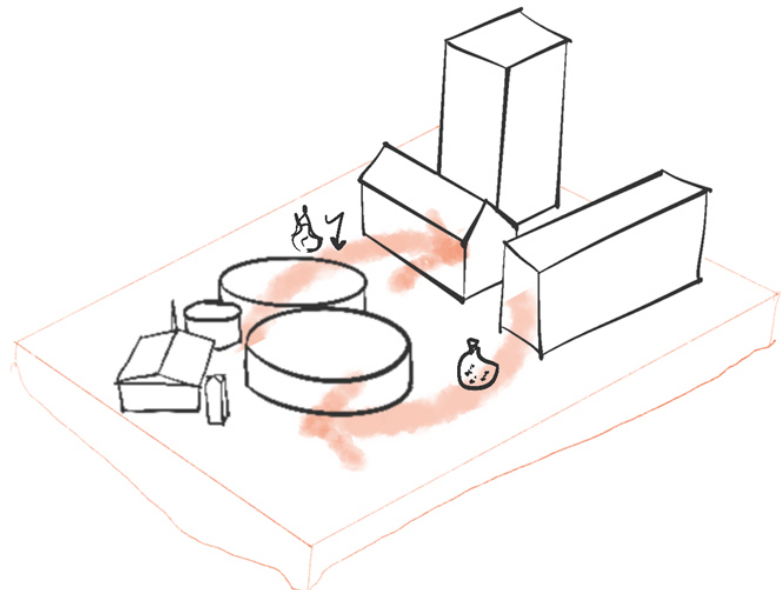


CIRCULAR SYSTEM INTERVENTIONS SYSTEMIC SECTION FOR FOOD AS A RESOURCE

SYSTEMIC SHIFT

DISTRICT BIOGAS SILO

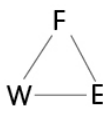
C.2



A District biogas silo would play a crucial role in closing the loops of a circular food system by shortening the distances for the infrastructure needed to transport waste and heat.

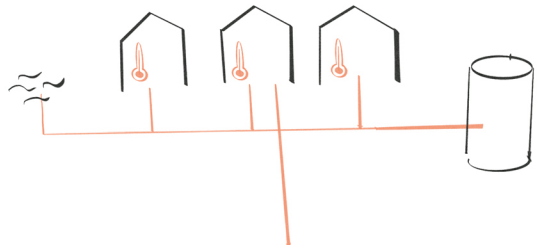


Connected patterns: C3,C5, S2, S4, S6, S7, S8, S9, C8, C10, C11



HEAT NETWORK

C10

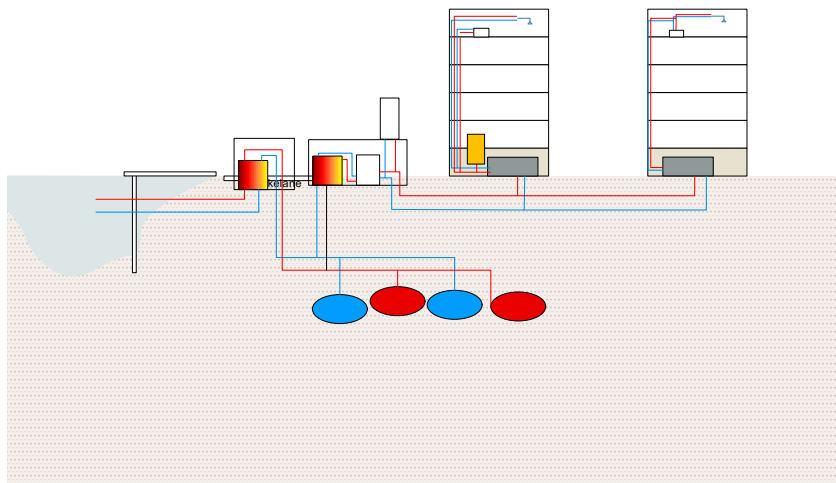


Implementing a decentralized heat network powered by biogas from local organic waste, supported by a heat pump (WKO).
Implication: rooms for heat pumps - water as aquathermal support
- heat (district + heating eg Polderwijk NL)



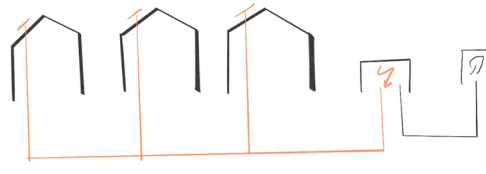
Connected patterns: -E3, C2, S8, C9,P10,P11, S14, P14





MICROGRID

C11

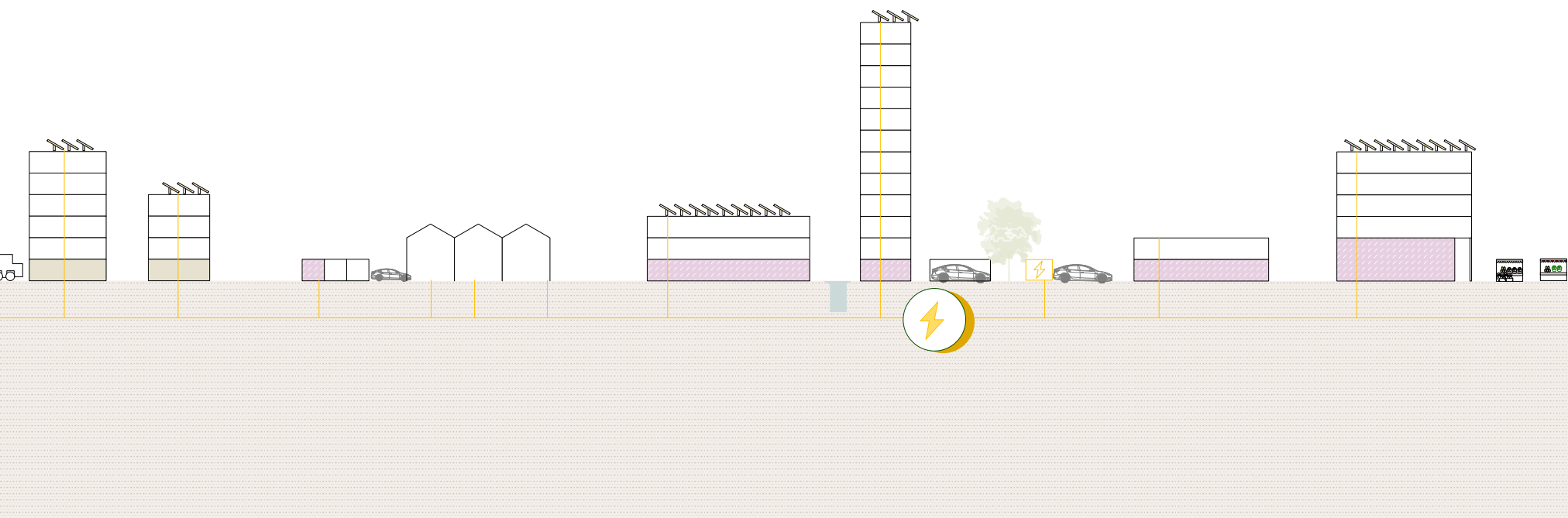


Microgrids are distributing the energy needed locally
'Community microgrids are a way for neighbourhoods, villages, towns and cities to meet their energy needs locally.' <https://carbontrack.com.au/blog/community-micro-grid/#:~:text=Community%20microgrids%20are%20a%20way,local%20energy%20independence%20and%20resilience.>



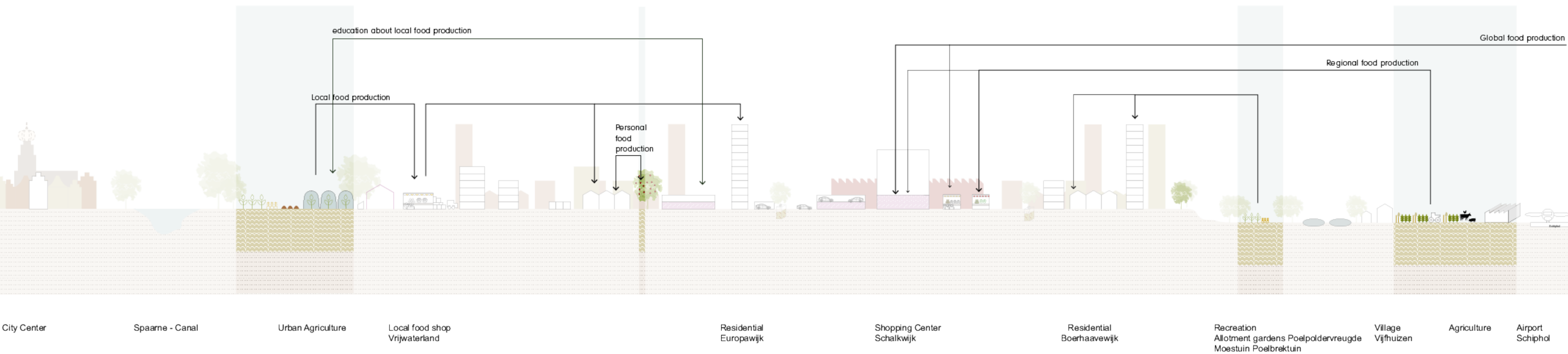
Connected patterns: C2, C10, P9, P10, P11,





SYSTEMIC SHIFT

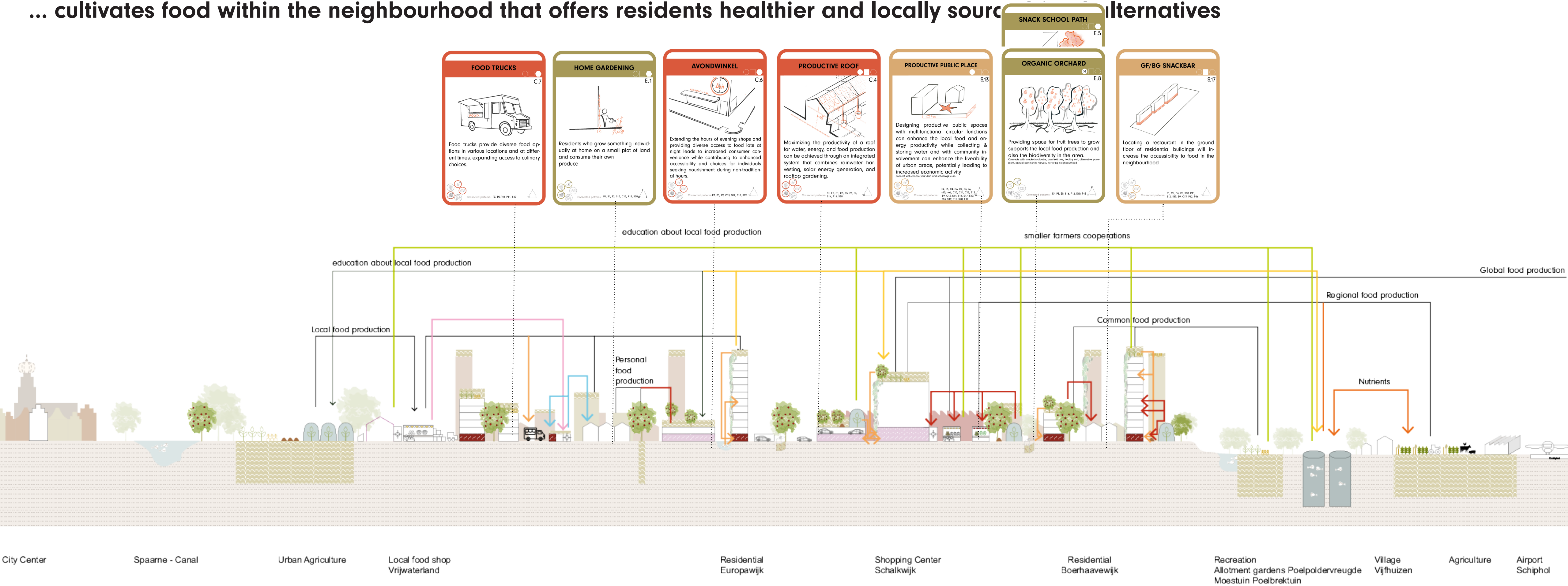
The circular foodscape in Schalkwijk...
... cultivates food within the neighbourhood that offers residents healthier and locally sourced food alternatives



CURRENT SITUATION SYSTEMIC SECTION FOOD PRODUCTION& DISTRIBUTION

SYSTEMIC SHIFT

The circular foodscape in Schalkwijk...
... cultivates food within the neighbourhood that offers residents healthier and locally sourced alternatives



CIRCULAR SYSTEM INTERVENTIONS SYSTEMIC SECTION FOR FOODSCAPE

ORGANIC ORCHARD

ORGANIC ORCHARD

GB

E.8



Providing space for fruit trees to grow supports the local food production and also the biodiversity in the area.

Connects with snackschoolpaths, own fruit tree, healthy soil, alternative pavement, annual community harvest, nurturing neighbourhood

Connected patterns: E7, P8, E9, S16, P12, E10, P13

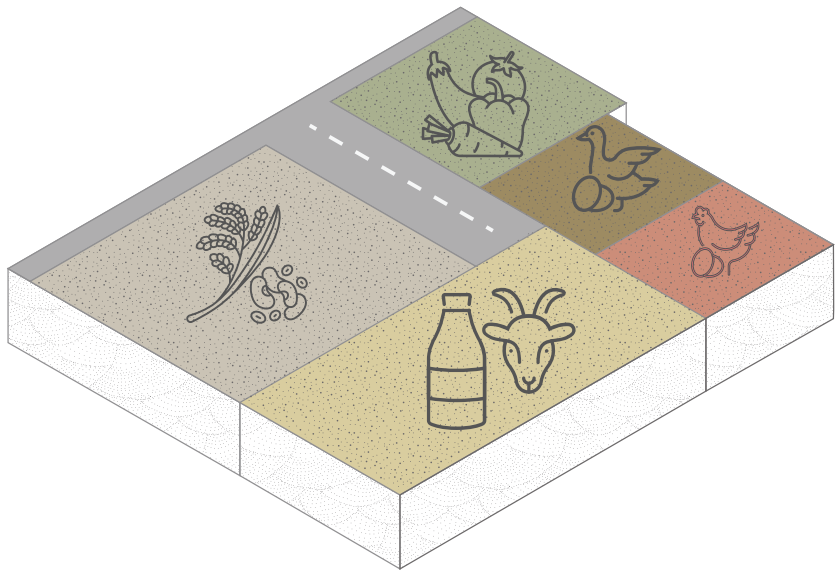
F

W

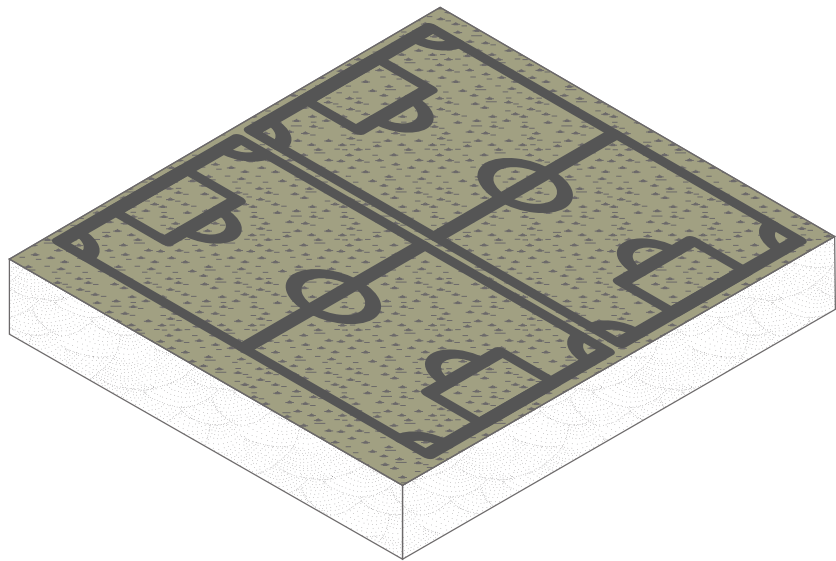
E



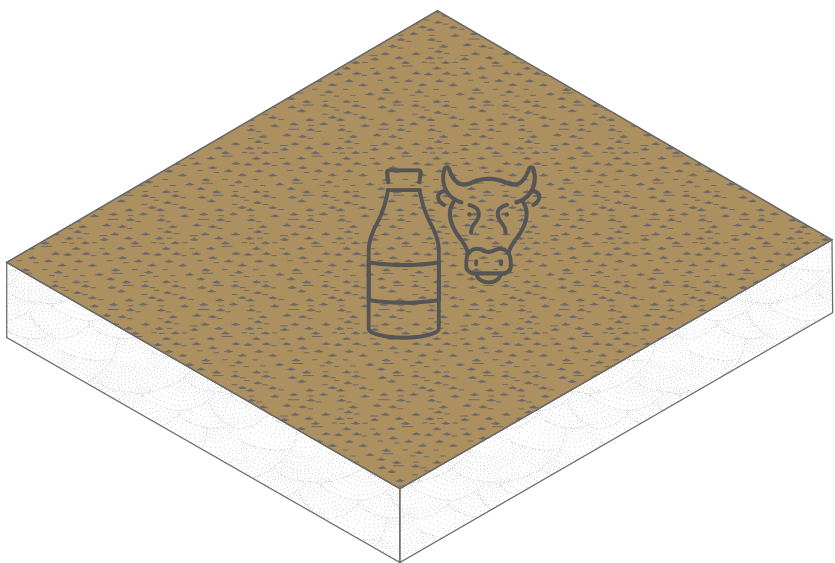
LOCAL FOOD PRODUCTION



Space needed to feed one person with Permaculture food for one year without beef or cow milk: 1,5ha



1,5ha is equivalent to two football fields

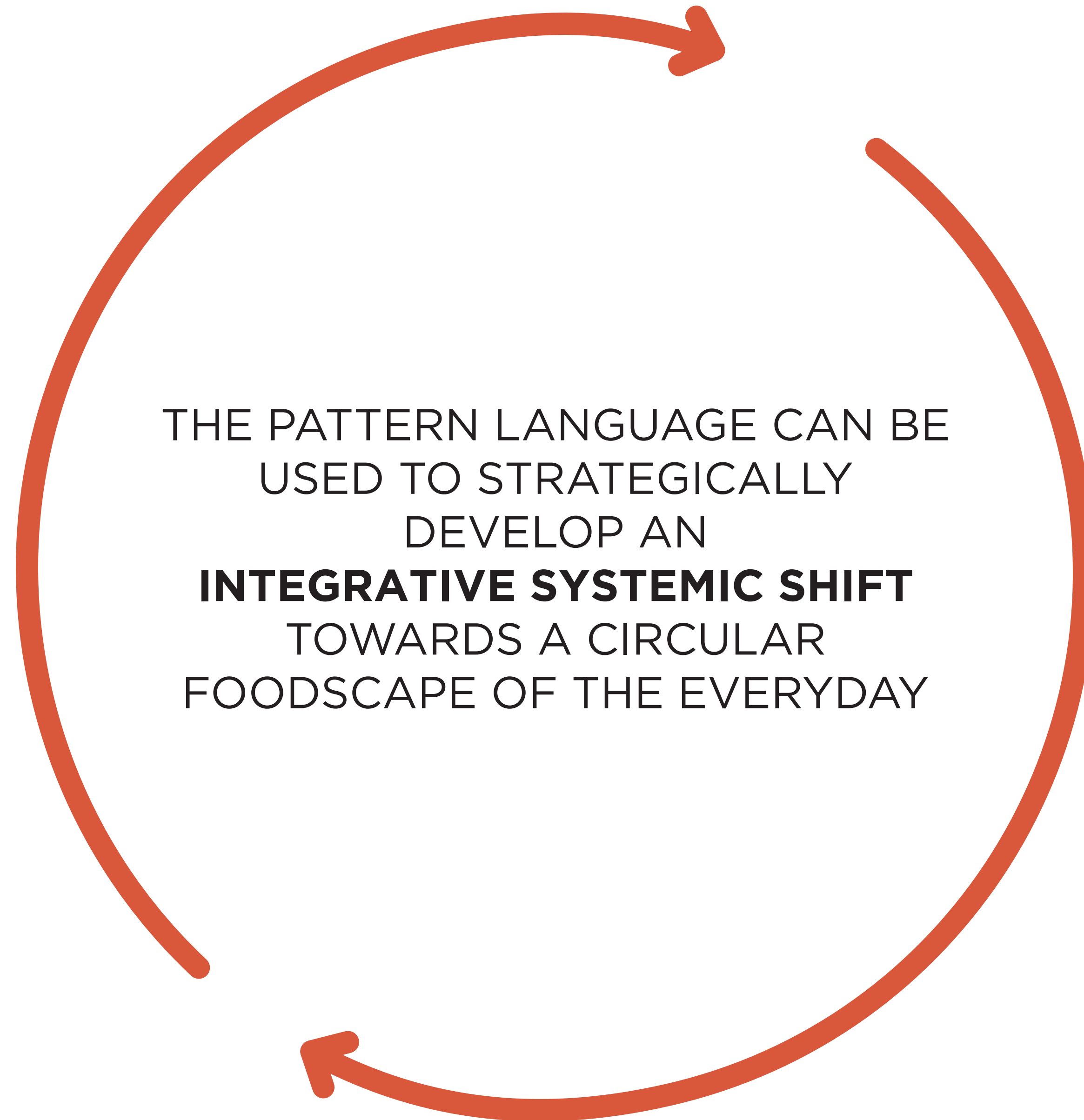


1,5ha is equivalent to the space needed to produce beef and milk

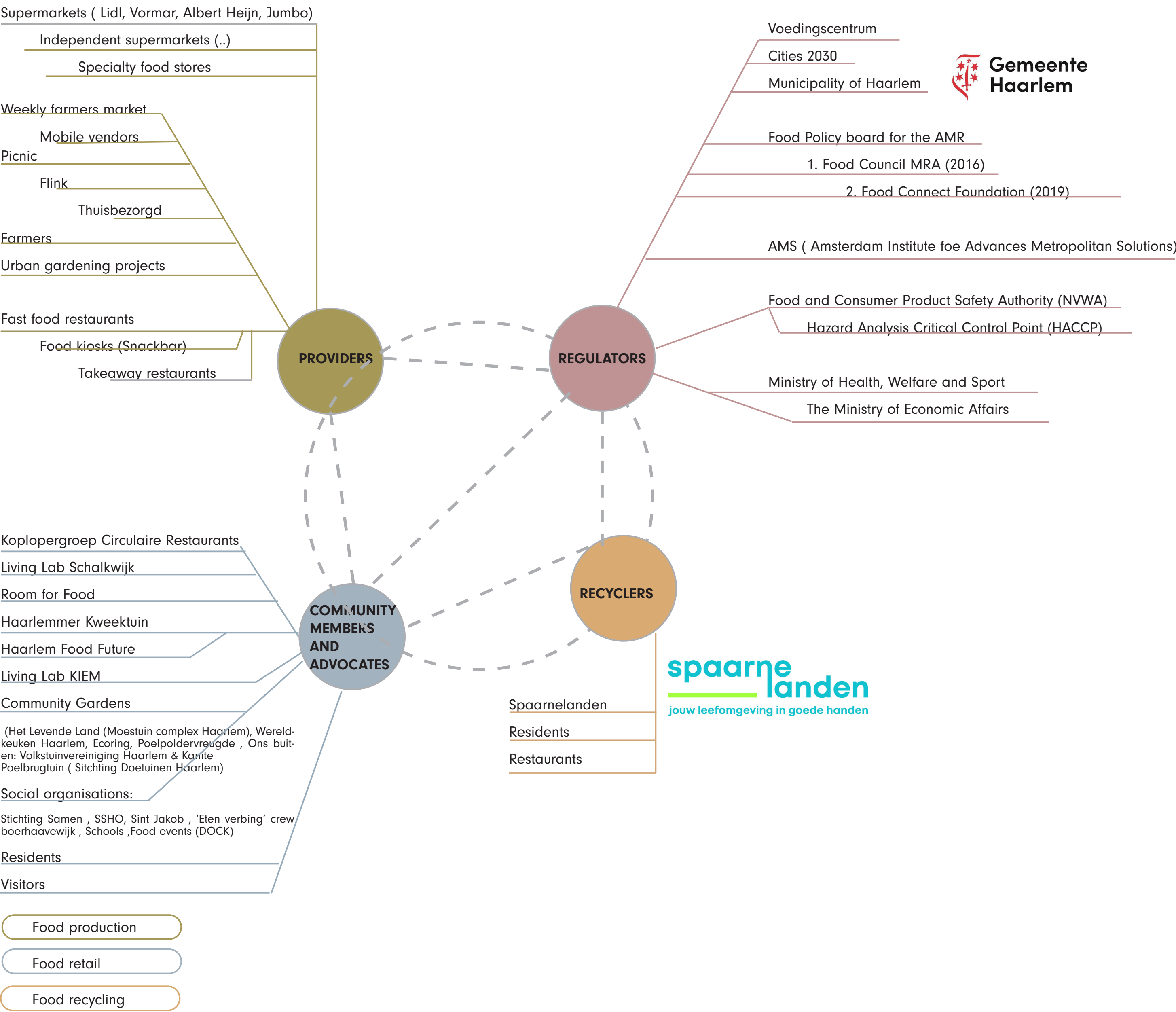
Map if all parking lots and sealed spaces turned to green spaces



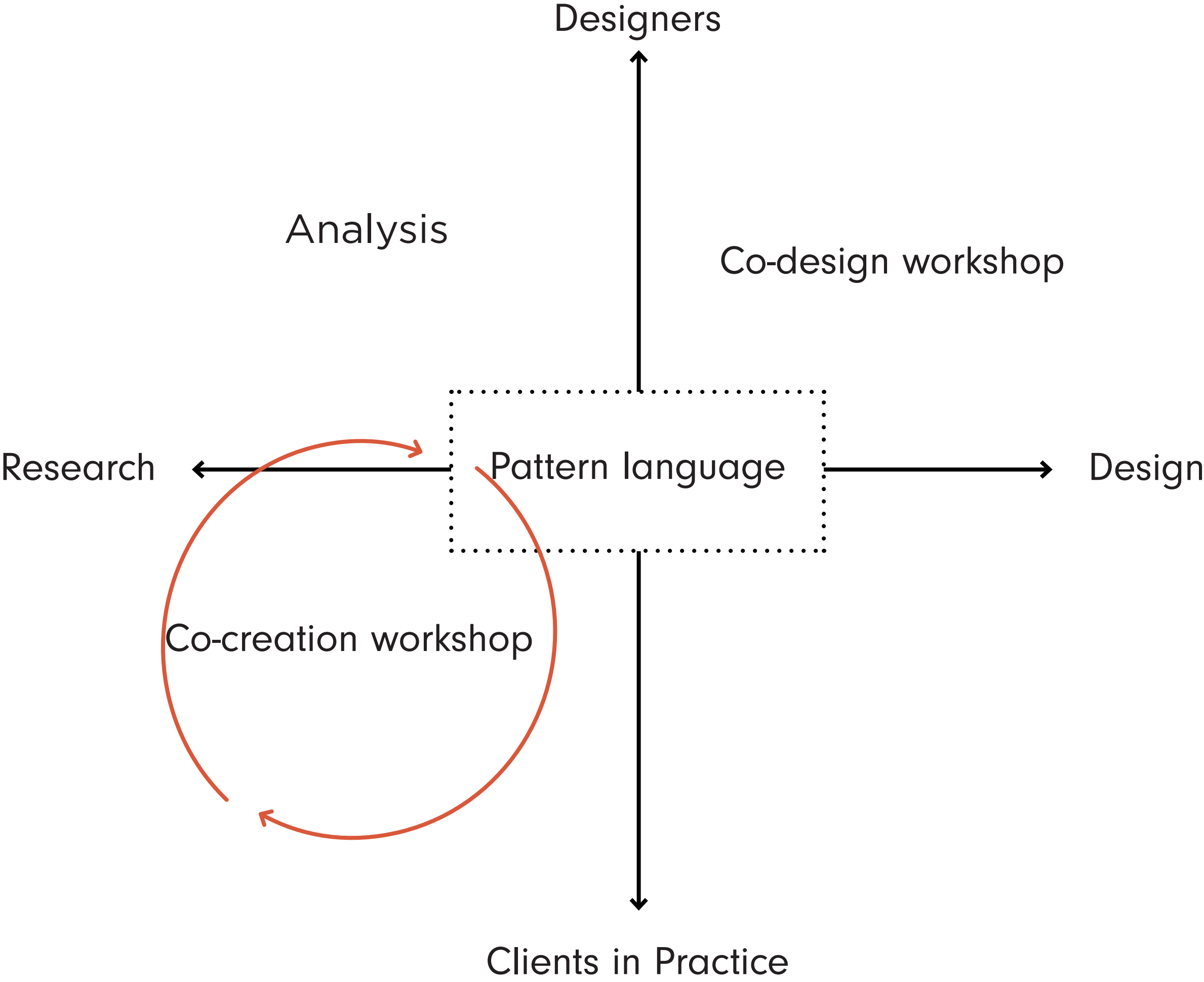
SUMMARY



FOODSCAPE ACTORS

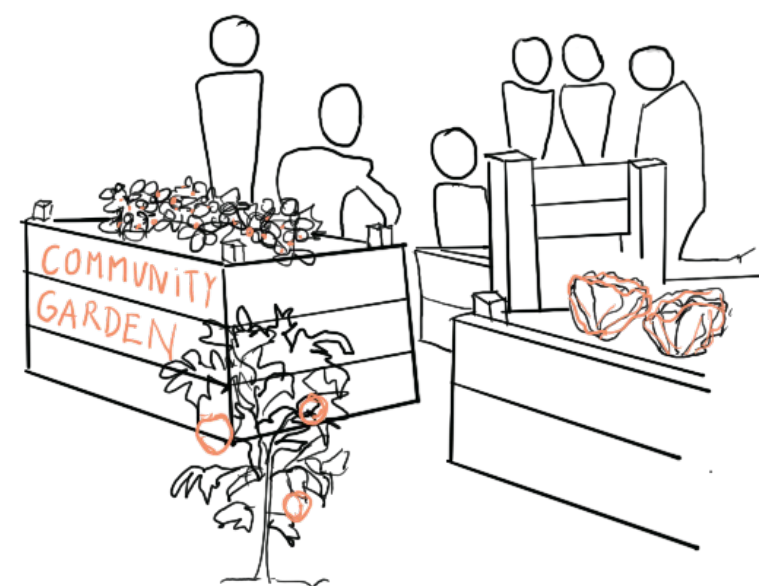


PATTERN LANGUAGE AS CO-CREATION APPROACH

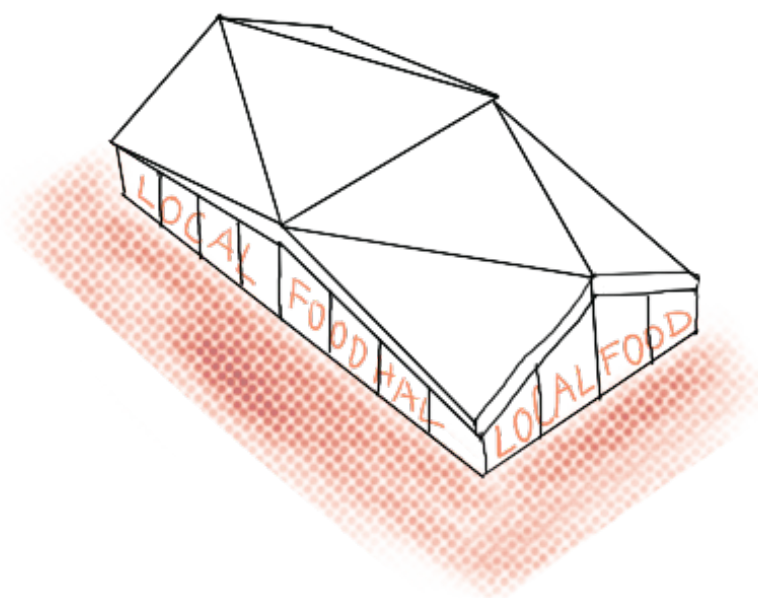


ADDING LOCAL KNOWLEGDE

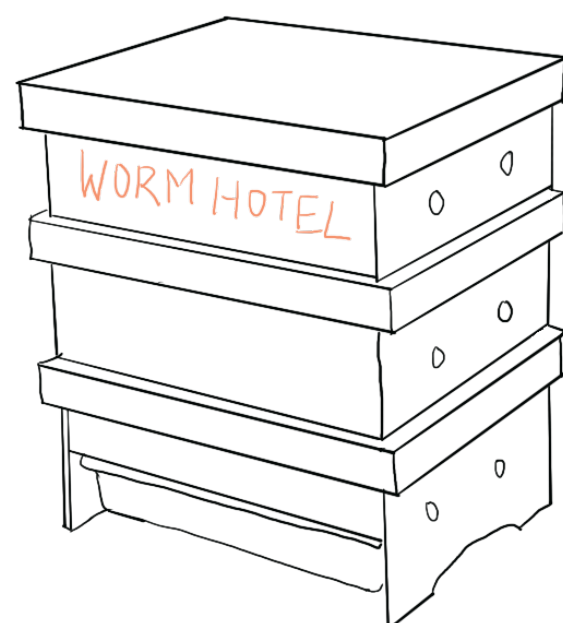
Community garden



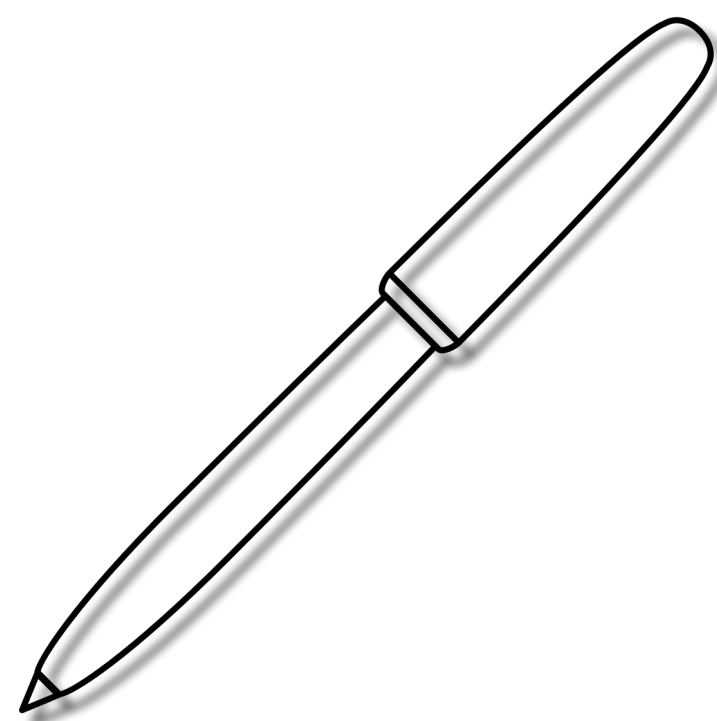
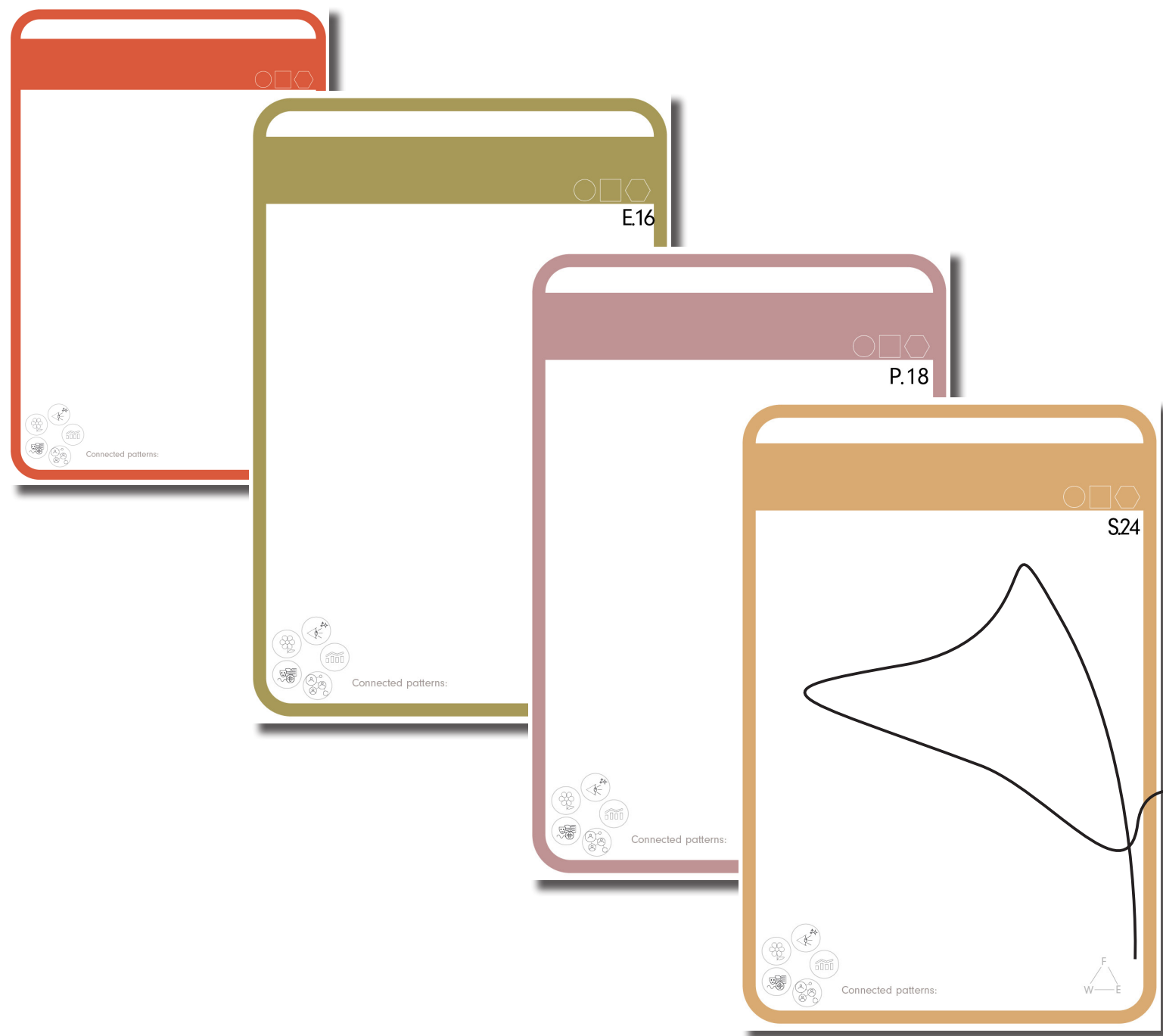
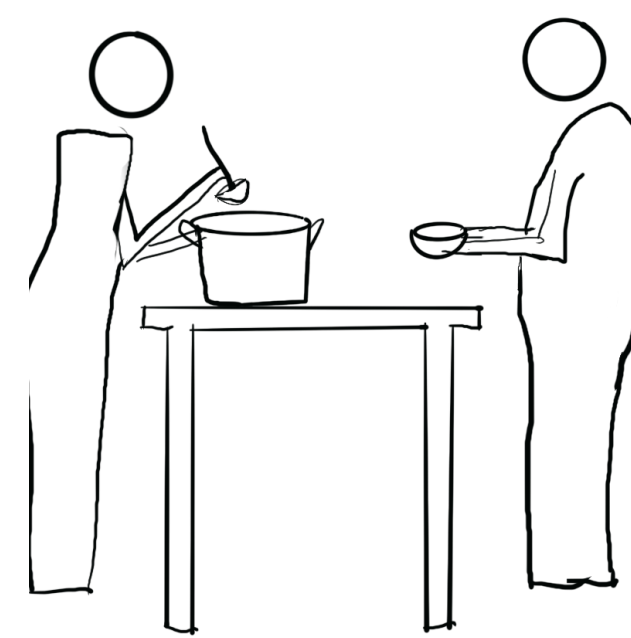
Local Foodhal



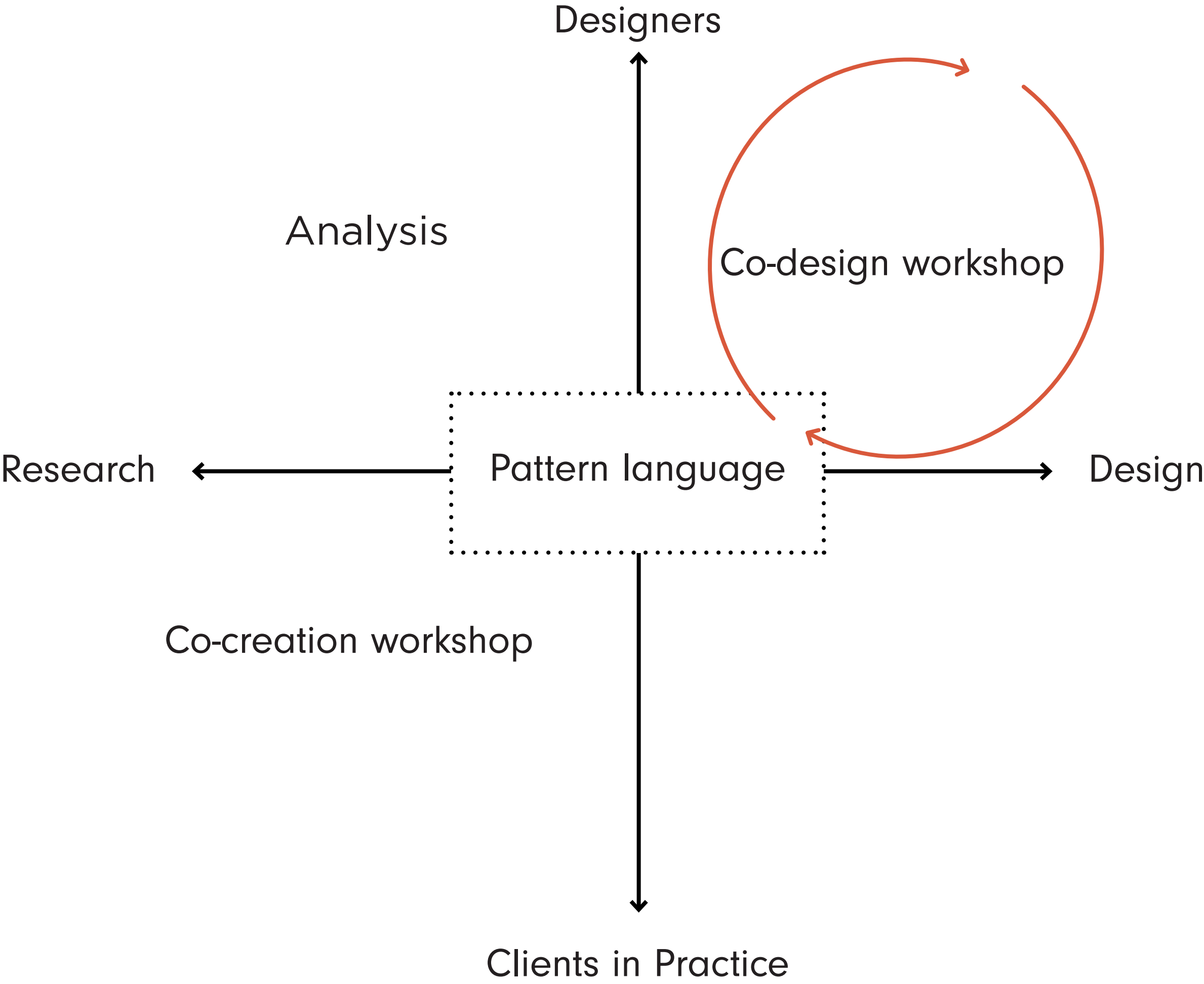
Worm hotel



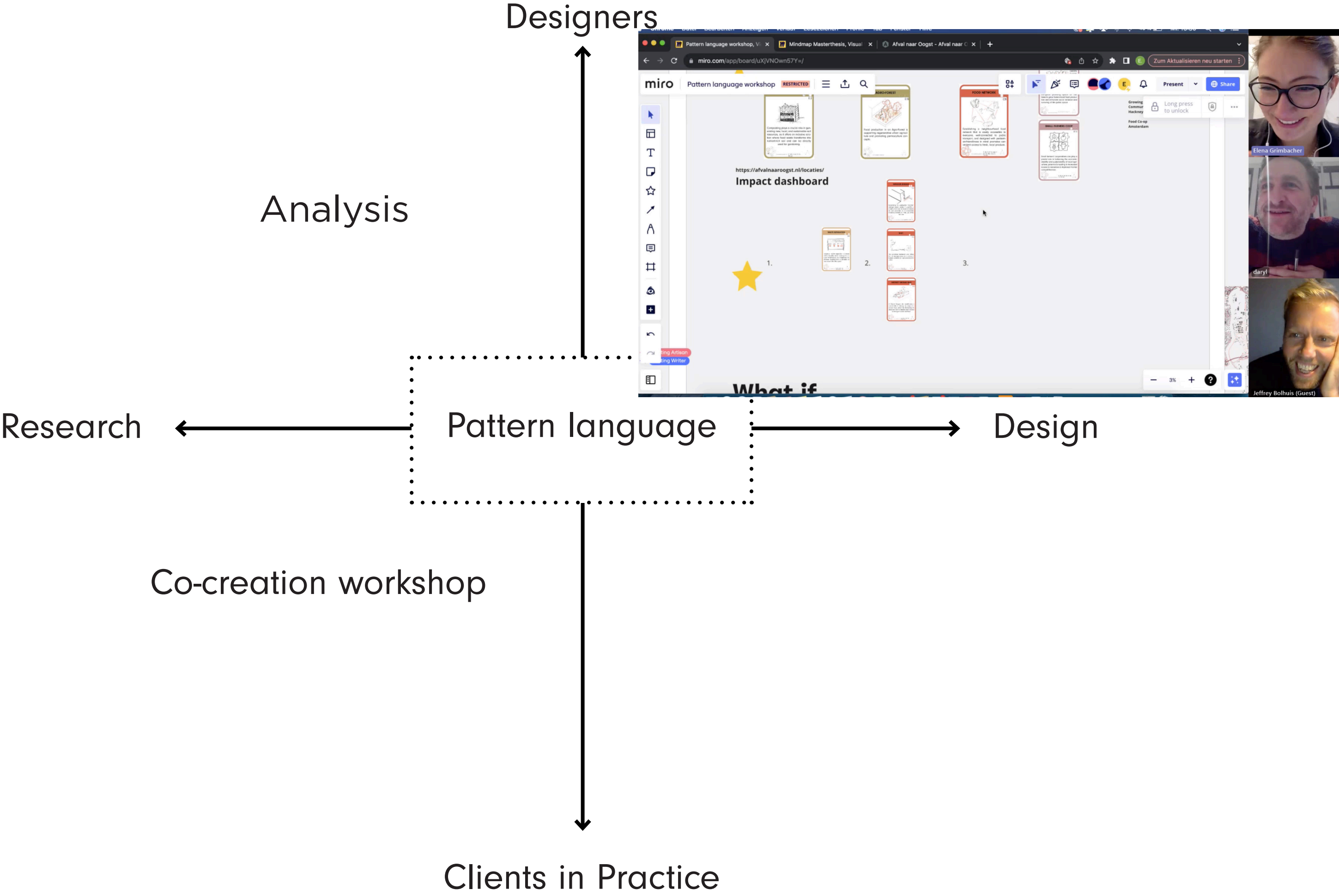
Community Kitchen Haarlem Euro



PATTERN LANGUAGE AS CO-DESIGN APPROACH



PATTERN LANGUAGE AS CO-CREATION APPROACH



CO-DESIGN WORKSHOP

Co-Design Workshop

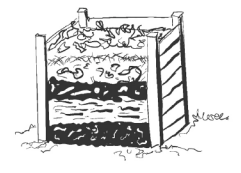


DESIGN OUTCOME

Easy & convenient & low maintenance

COMPOST

E.2



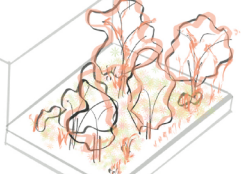
Composting plays a crucial role in generating new, local, and sustainable soil resources, as it offers an inclusive solution where food waste transforms into nutrient-rich soil and can be directly used for gardening.

Connected patterns:

P1, P2, S1, E1, C2, C5, S8, S20

AGRO-FOREST

E.13



Food production in an Agro-Forest is supporting regenerative urban agriculture and promoting permaculture concepts.

Connected patterns:

FOOD NETWORK

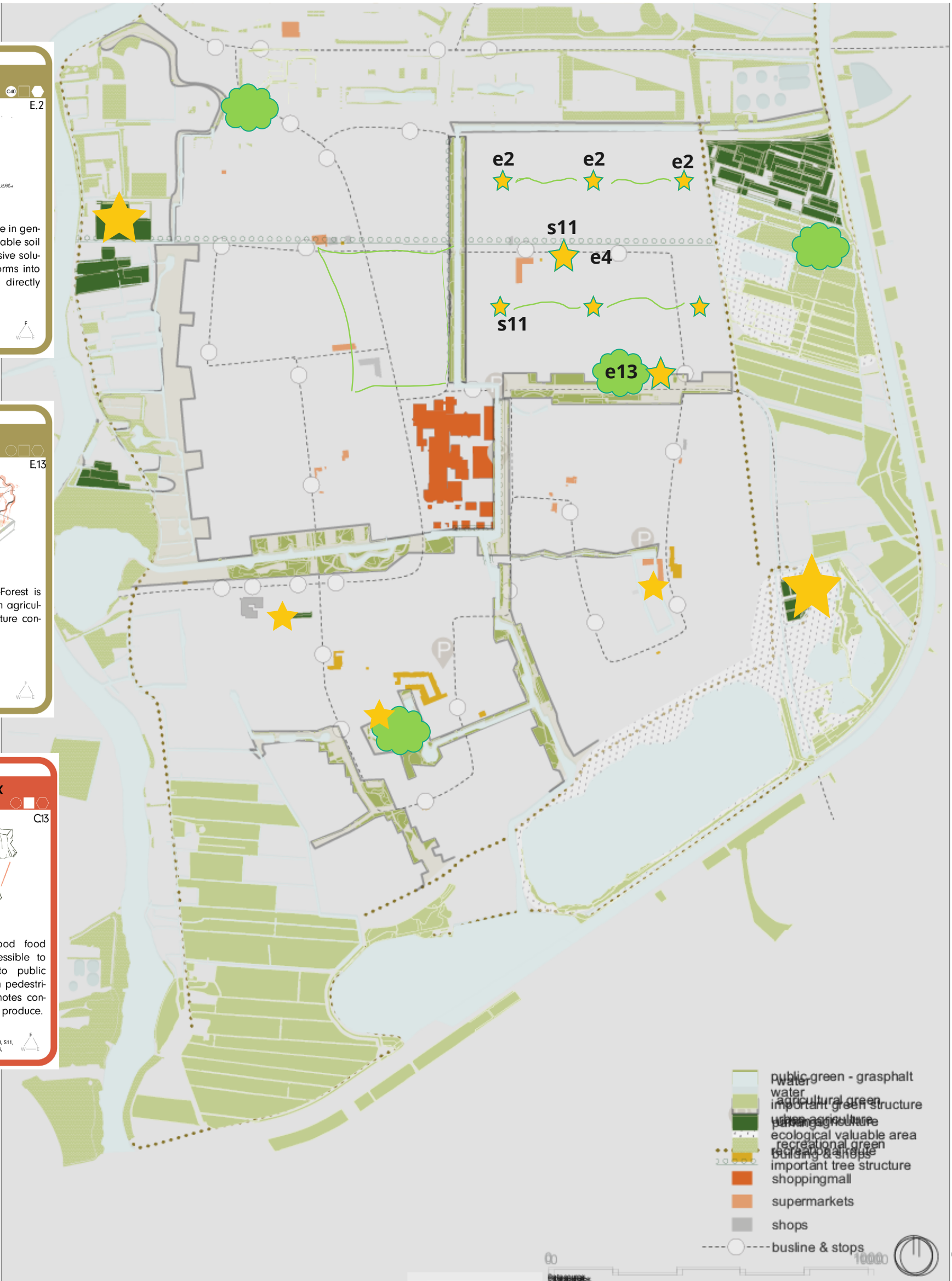
C.13



Establishing a neighbourhood food network that is easily accessible to everyone, well-connected to public transport, and designed with pedestrian-friendliness in mind promotes convenient access to fresh, local produce.

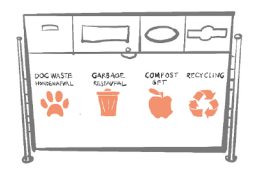
Connected patterns:

P1, P4, E4, S5, S6, S10, S11, S8, S12, S15, C13, S16, P12, E12



WASTE SEPARATION

S.8



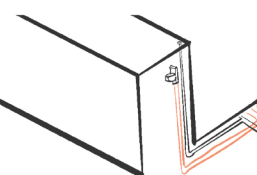
Individual waste separation is essential for the effective functioning of a circular infrastructure, as it facilitates the efficient recycling and re utilisation of resources within the system.

Connected patterns:

P1, P2, S2, S4, S5, S7, S8, S11, C3, P14, S19

SEPARATE SEWAGE

C.3



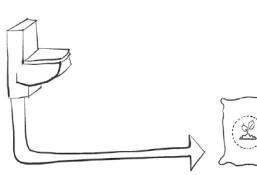
Separating the wastewater collection sewage system makes it possible to create small loop for reuse of rainwater and separates human wastewater including nutrients to make use of this resource.

Connected patterns:

C1, C2, C4, C5, S6, C16, C17, S13, W

SHIT!

C.5



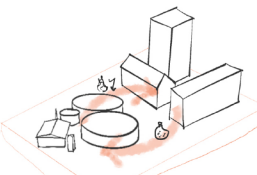
The collection, treatment, and utilization of sewage waste as a source of human nutrients for agricultural fertilization

Connected patterns:

E2, E3, C3, S7, C16, C17, E11, S20

DISTRICT BIOGAS SILO

C.2

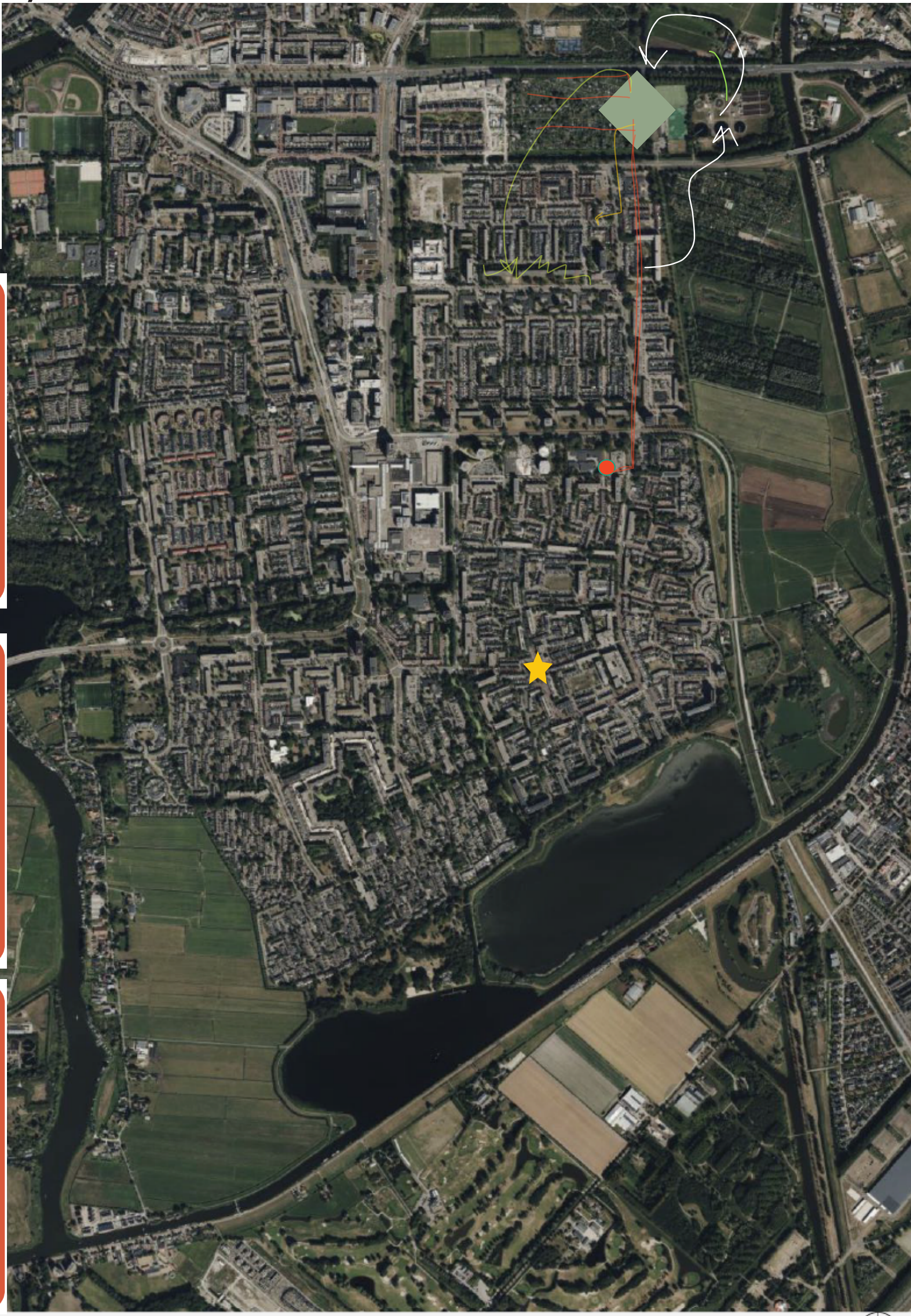


A District biogas silo would play a crucial role in closing the loops of a circular food system by shortening the distances for the infrastructure needed to transport waste and heat.

Connected patterns:

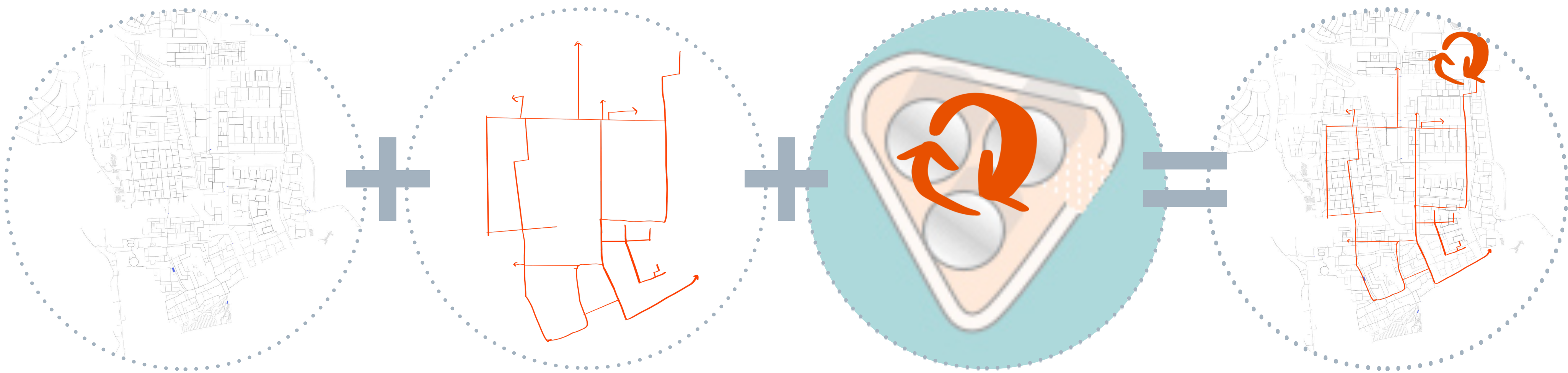
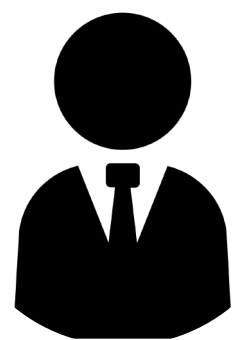
C3, C5, S2, S4, S6, S7, S8, S9, C8, C10, C11

Systemic & Infrastructure



FRAMEWORK OF CO-DESIGN

Strategy 1
Systemic & Infrastructure



SEPARATE SEWAGE

HEAT NETWORK

BIOGAS SILO

CIRCULAR INFRASTRUCTURE NETWORK

SEPARATE SEWAGE

C.3

Separating the wastewater collection sewage system makes it possible to create small loop for reuse of rainwater and separates human wastewater including nutrients to make use of this resource.

Connected patterns: C1C2C4C5C6C10C11S15 W-E

HEAT NETWORK

C.0

Implementing a decentralized heat network powered by biogas from local organic waste, supported by a heat pump (WKO).
Application: rooms for heat pumps - water as aquathermal support
heat (district - heating eg Paderborn N2)

Connected patterns: C3, C2, S4, C5P8P11, S14, P14

DISTRICT BIOGAS SILO

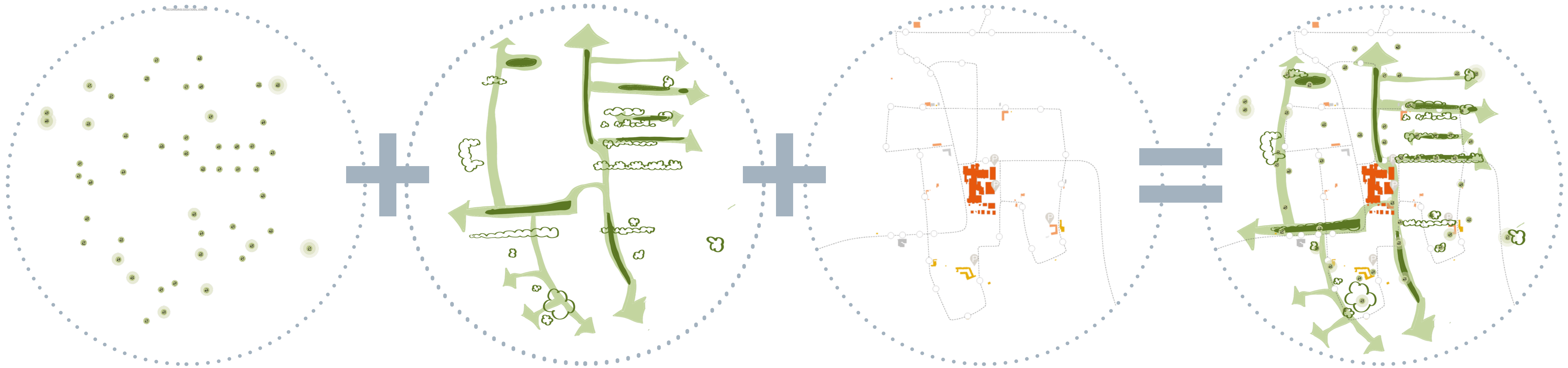
C.2

A District biogas silo would play a crucial role in closing the loops of a circular food system by shortening the distances for the infrastructure needed to transport waste and heat.

Connected patterns: C3C5, S2, S4, S6, S7, S8, S9, C8, C10, C11

FRAMEWORK OF CO-DESIGN

Strategy 2
Easy & convenient & low maintenance

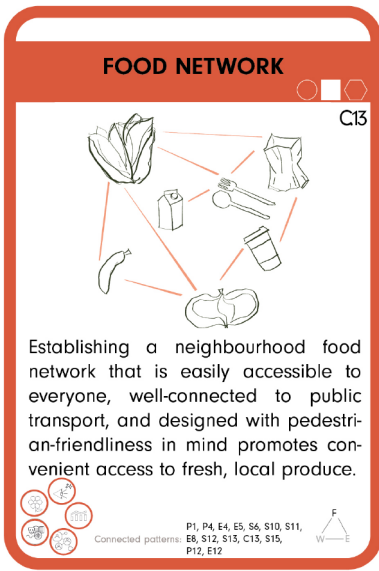
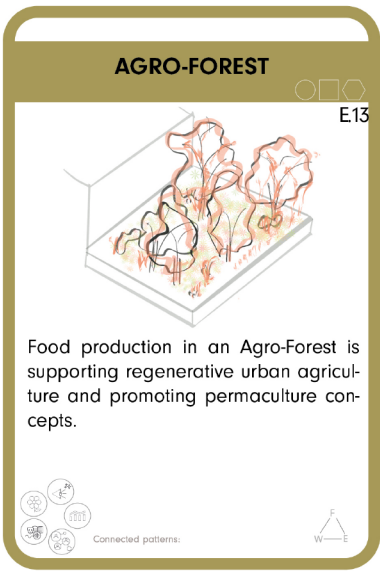
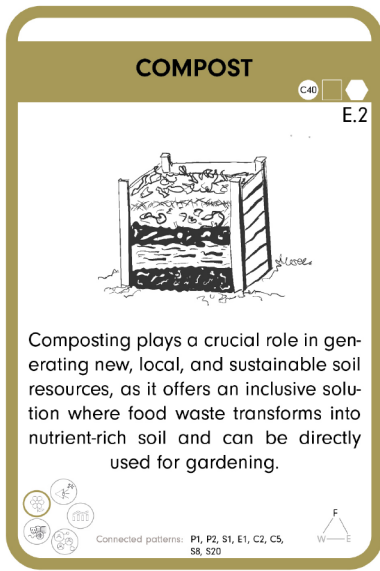


COMPOSTING

AGROFOREST

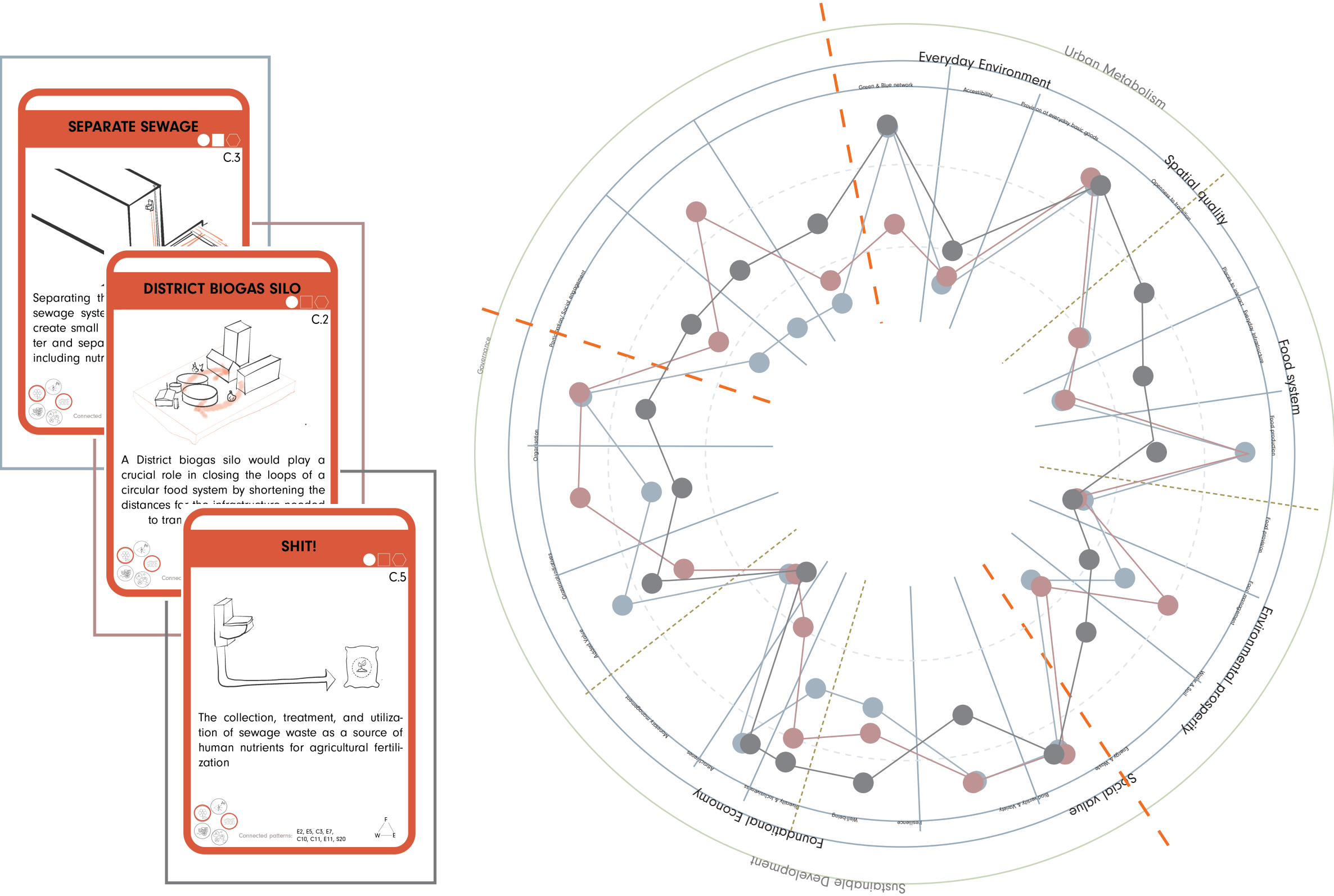
FOOD PLACES

FOOD NETWORK

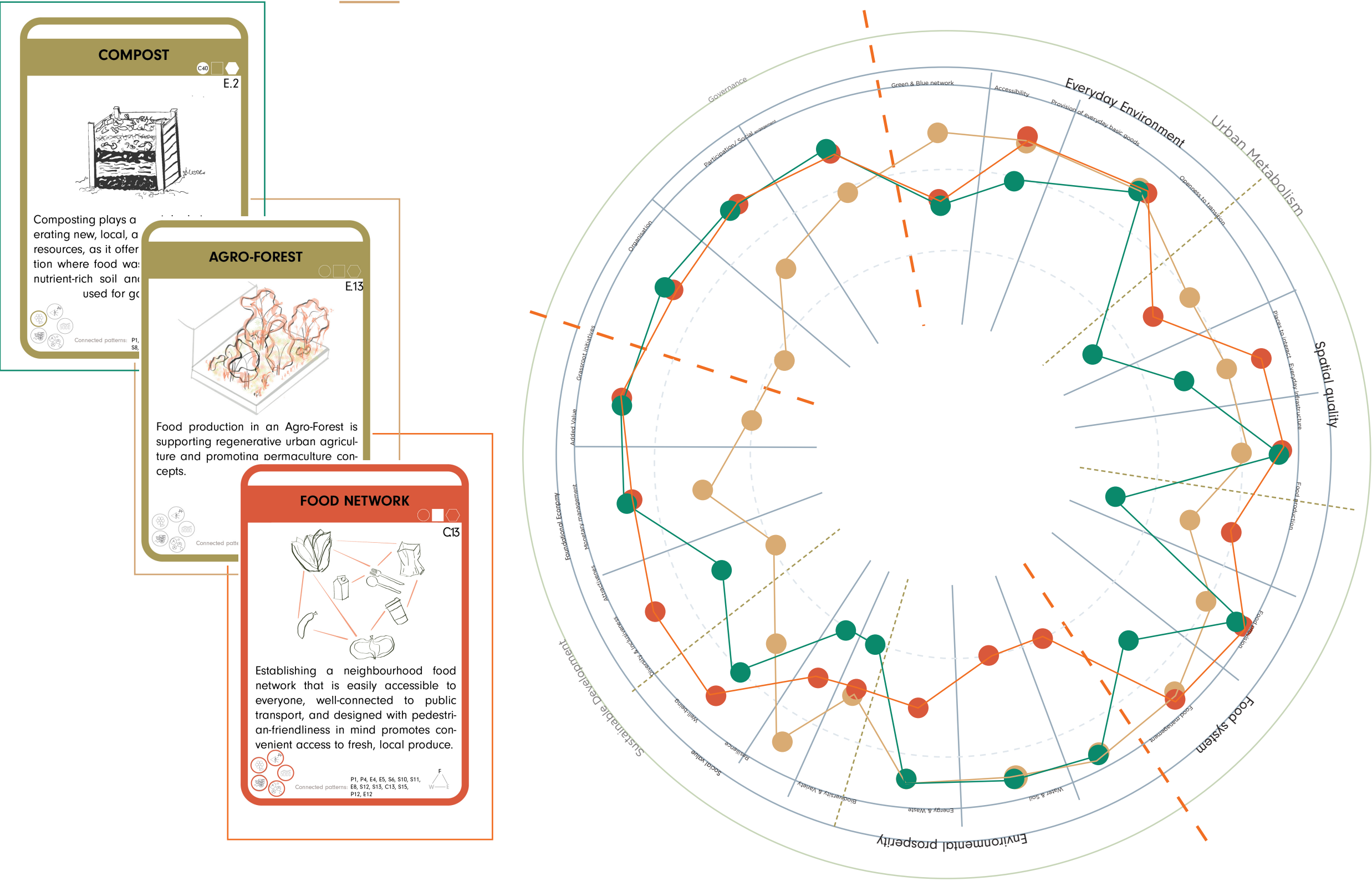


SPATIAL QUALITY

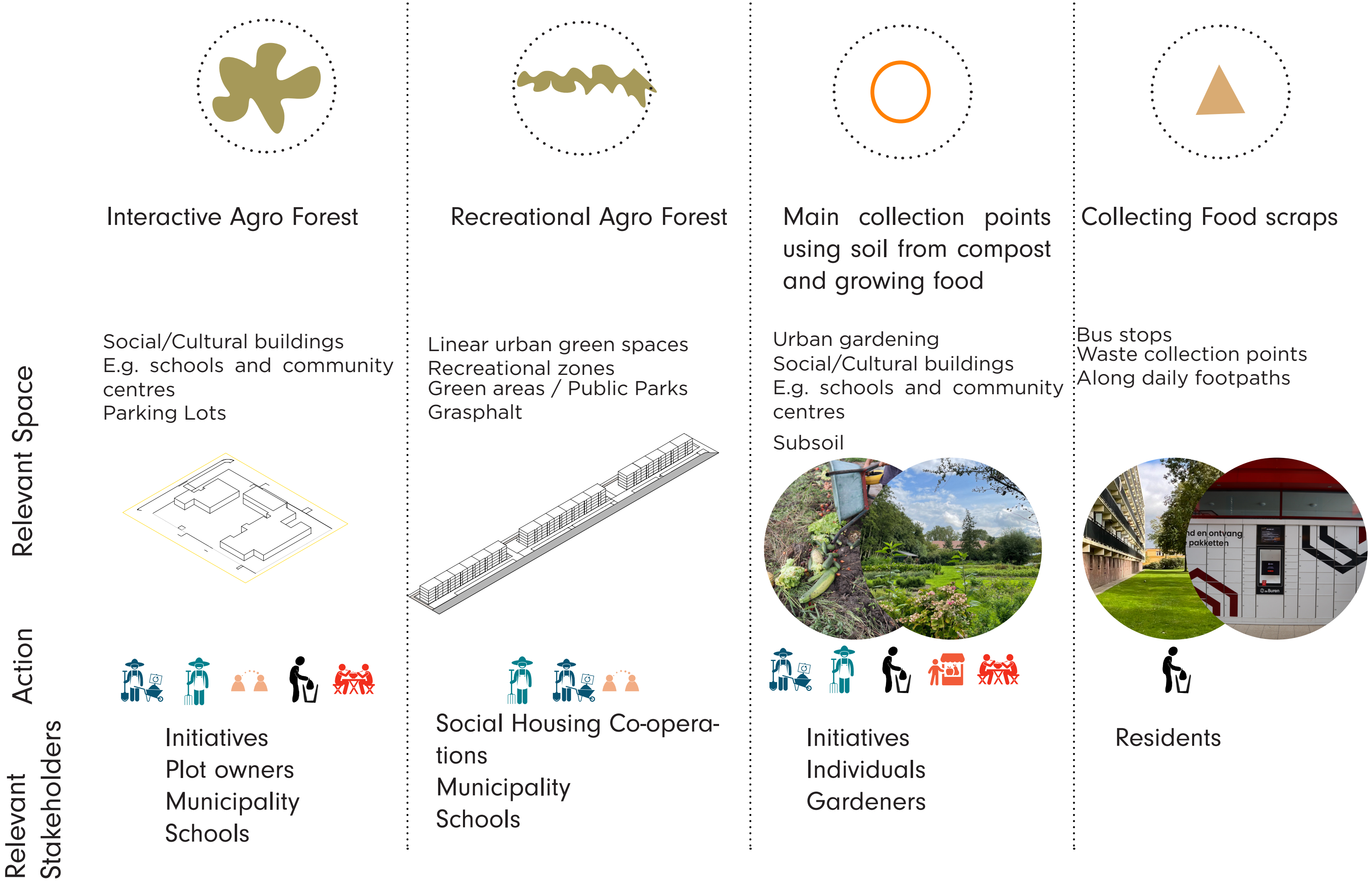
Assessment of co-design ‘infrastructural’



Assessment of co-design ‘convenience, ease, and simplicity’



SPATIAL RELATION



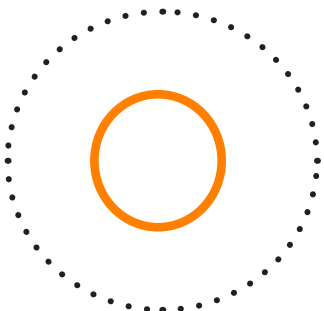
NEIGHBOURHOOD STRATEGY



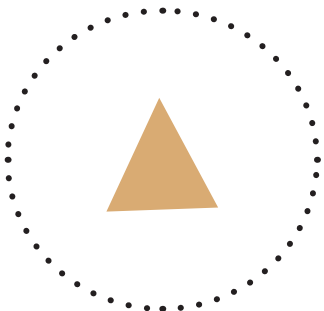
Recreational Agro Forest



Interactive Agro Forest



Main collection points
using soil from com-
post and growing food

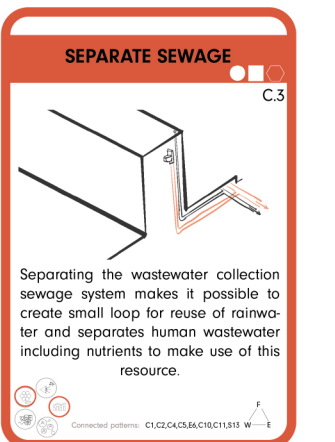
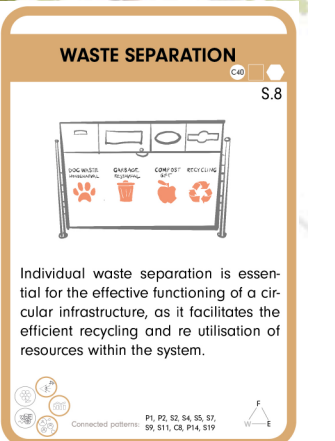
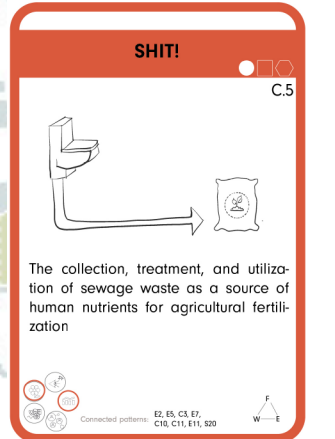
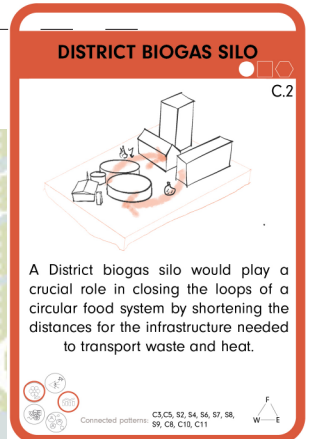
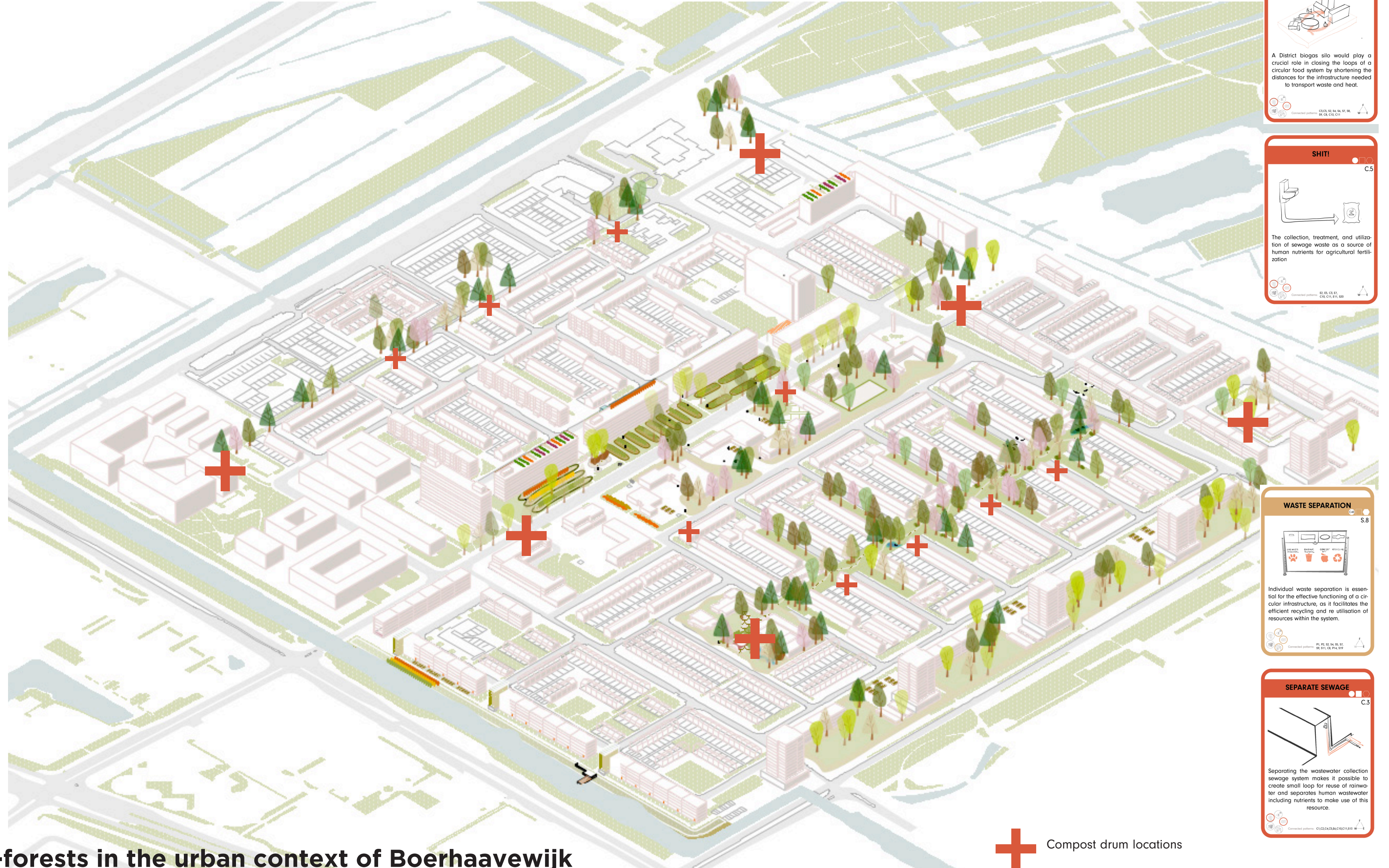
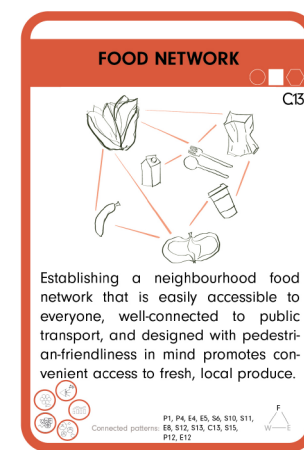
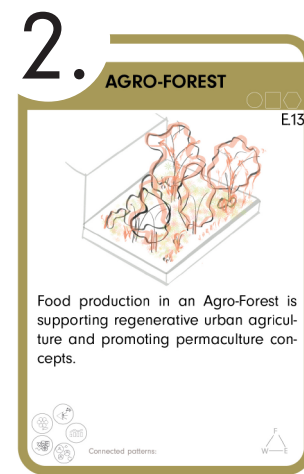


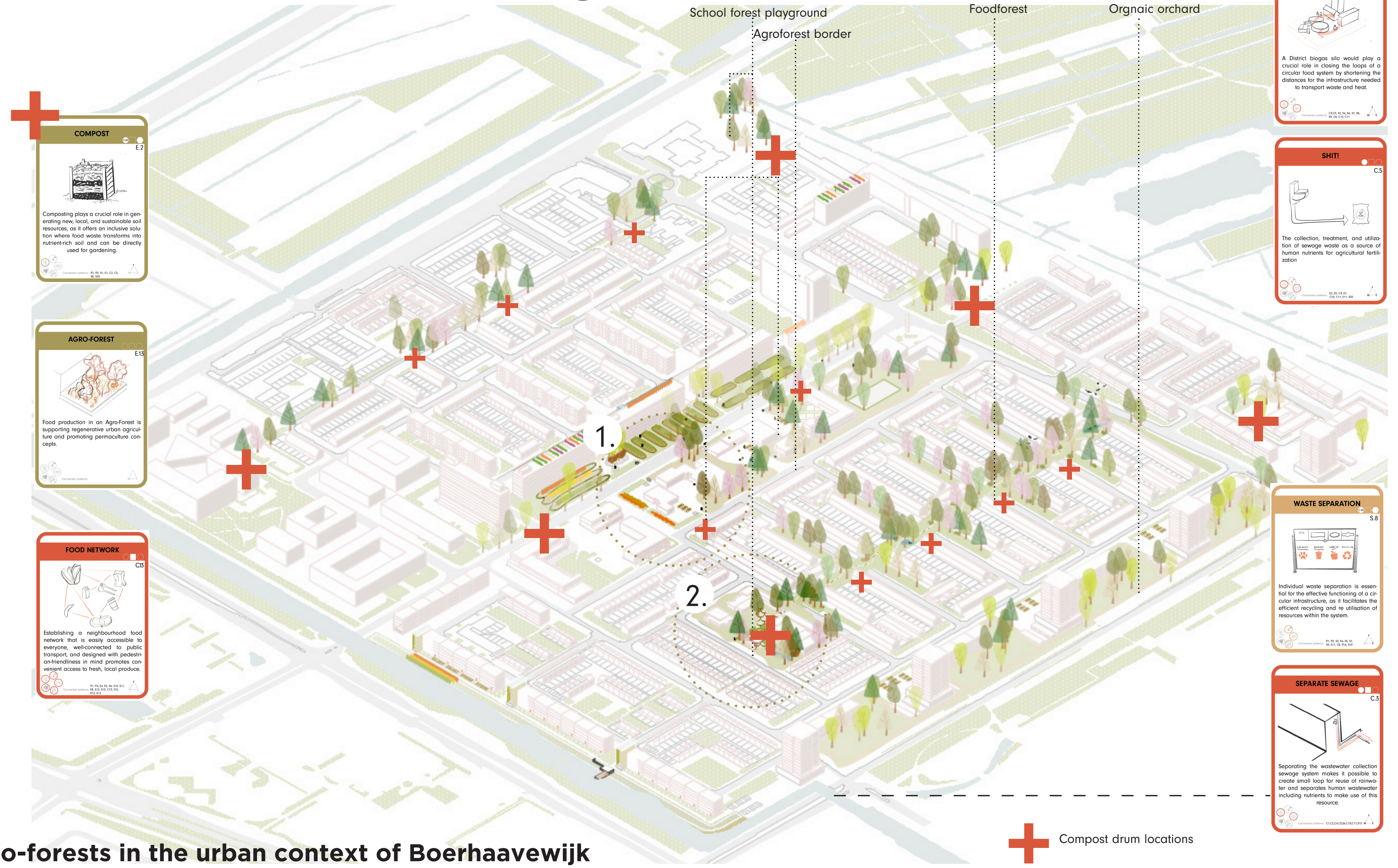
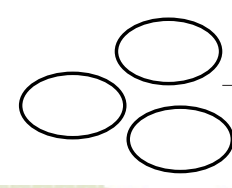
Collecting Food scraps

- Agro forest 
- Existing GFT bins 
- Main compost drums 
- Compost drums 
- Food network 

Strategies mapped in Schalkwijk



 Compost drum locations



Axonometric visualisation of agro-forests in the urban context of Boerhaavewijk

THE AGROFORESTRY BORDER



SCHOOL FOREST PLAYGROUND



SEASONALITY

Winter

PROSUME !



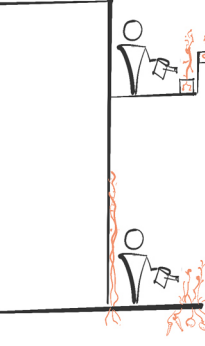
P.1

Consumer behaviour is changing towards a circular food system by transforming from a 'consumer' to a 'prosumer', by developing a high level of engagement in food production and an awareness of the long-term sustainability aspects of their food consumption.

P2, S1, P3, P4, E1, E2, E4, E5, P5, C4, S2, S3, S8, S9, P6, P8, P11, S12, C13, S15, P12, E10, W, P13, P14, P15, P16

F
E

LOCAL SOURCING



E14

Local food production strengthens the circular food system, shortens the food supply chain, and promotes social cohesion and inclusion by engaging city dwellers in urban agriculture and enhancing green networks.

C1, C4, C13, C14, E1, E2, E4, E5, E7, E8, E10, E11, E12, E13, P1, P6, P8, P11, P12, P13, S12, S14, S16, S20, S21

F
W



Spring



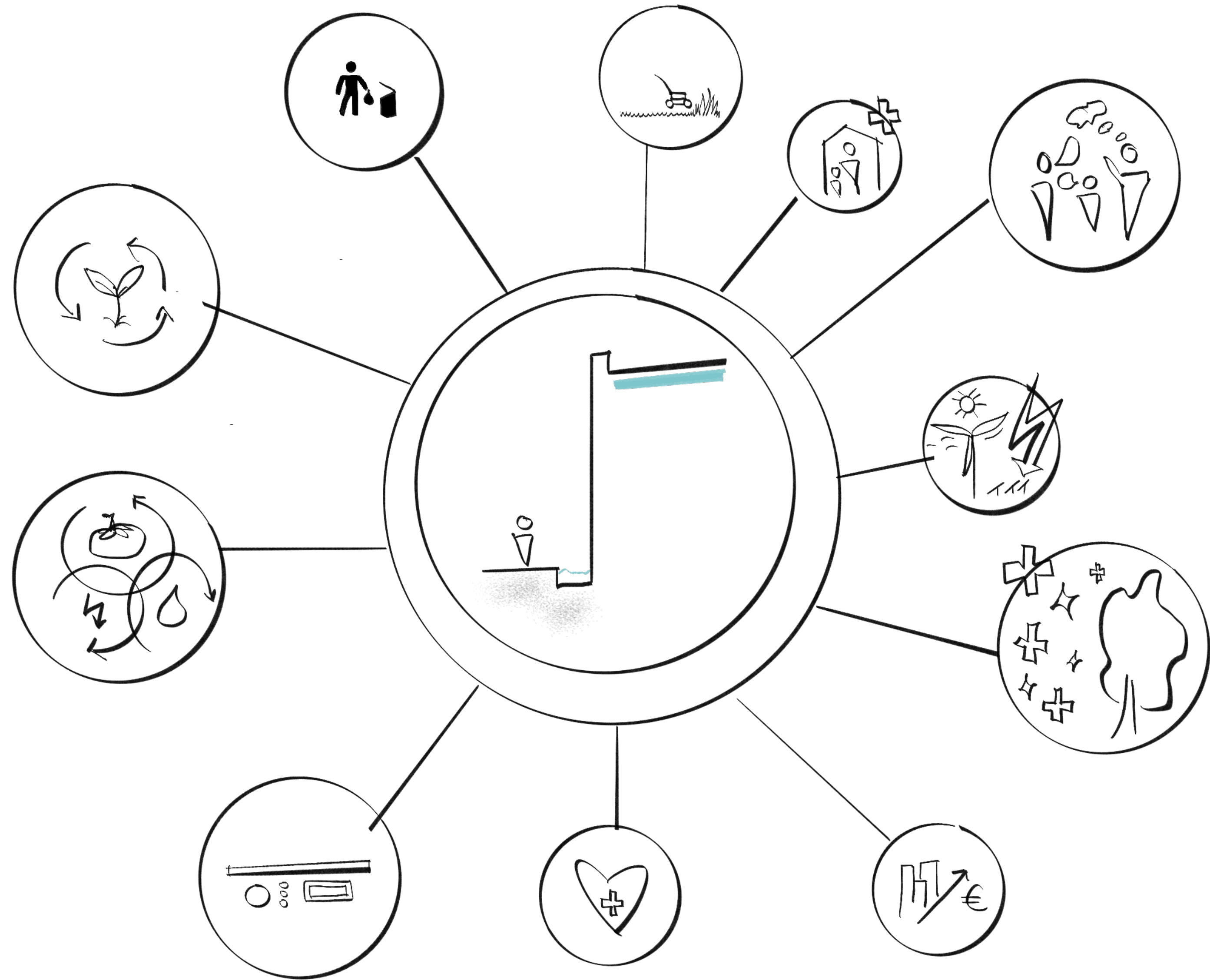
Summer



Autumn



GENERAL CONDITIONS



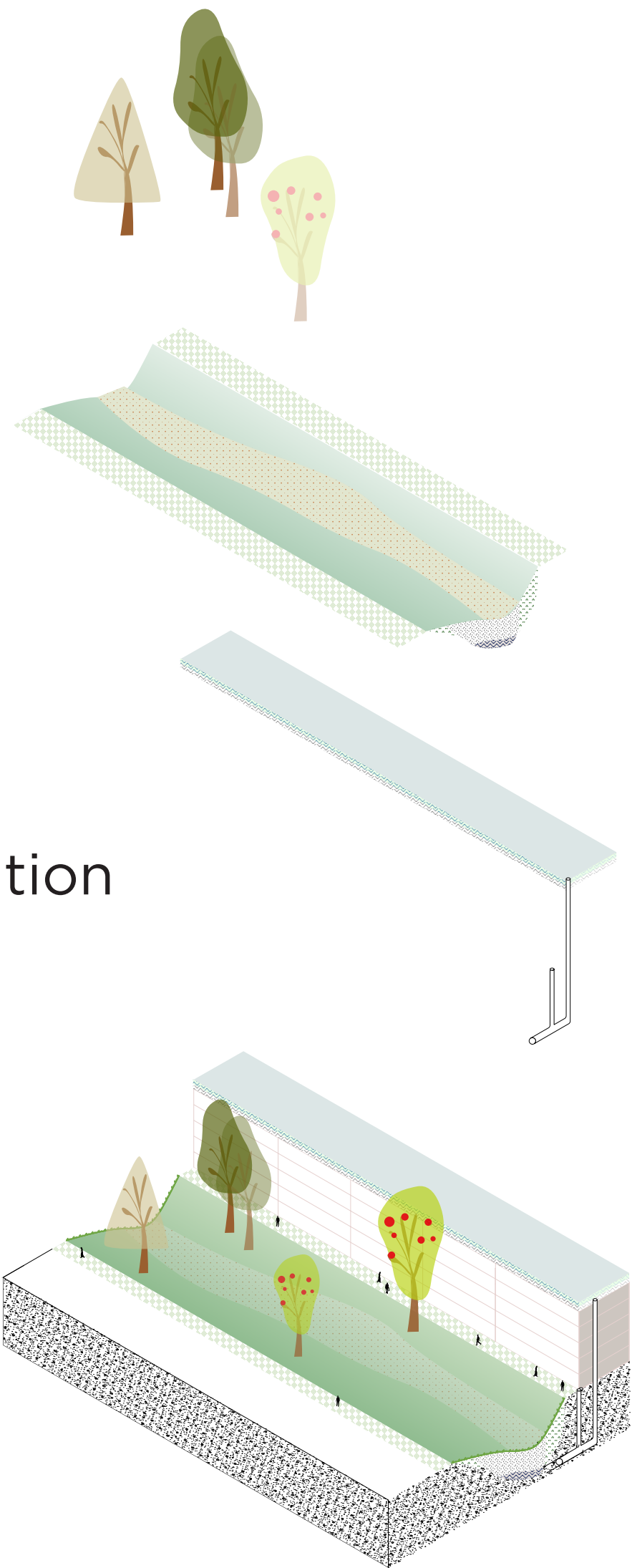
ZOOM OUT

Edible Foodscape

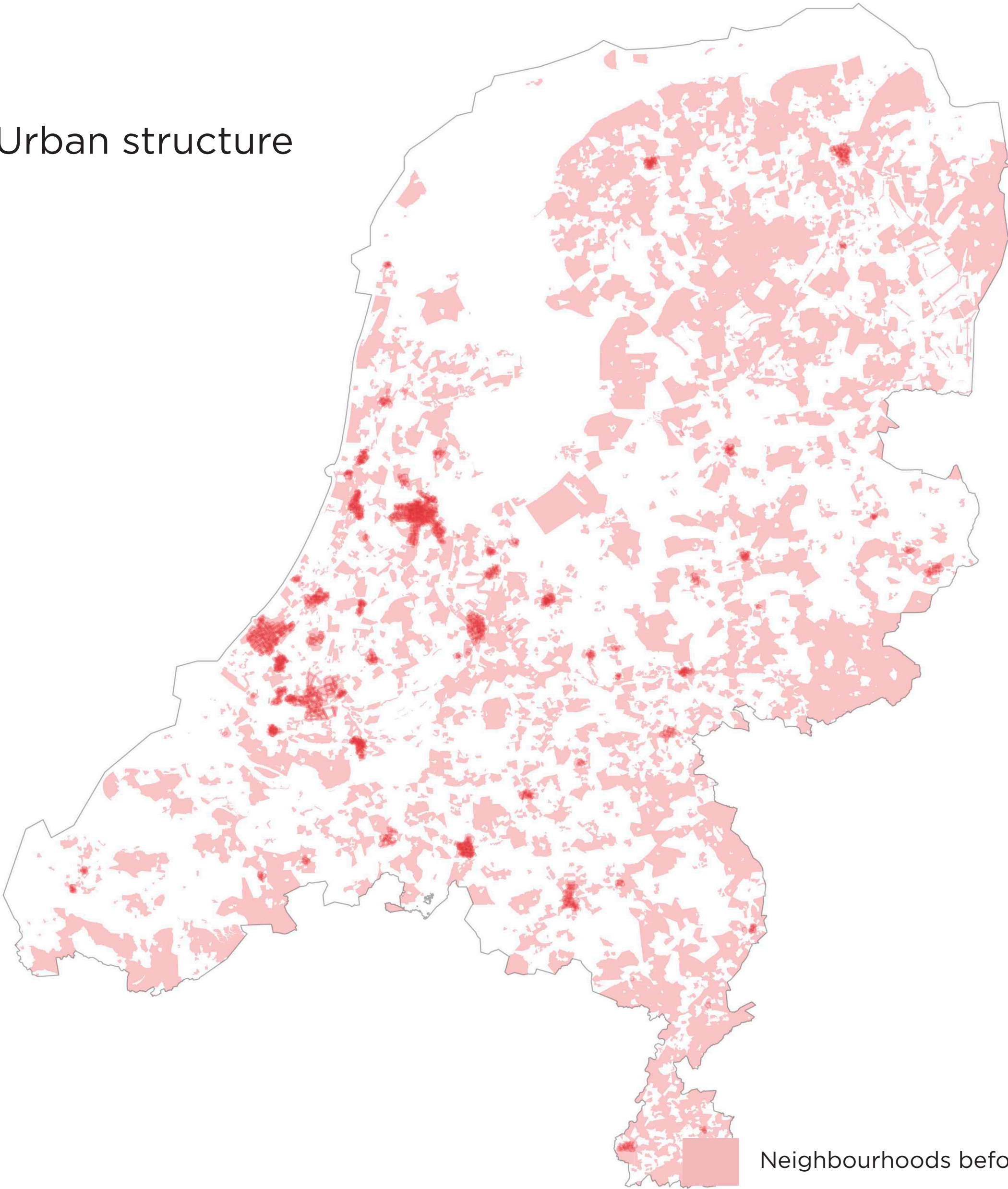
Regenerative Green

Technical innovation and adaptation

Urban structure



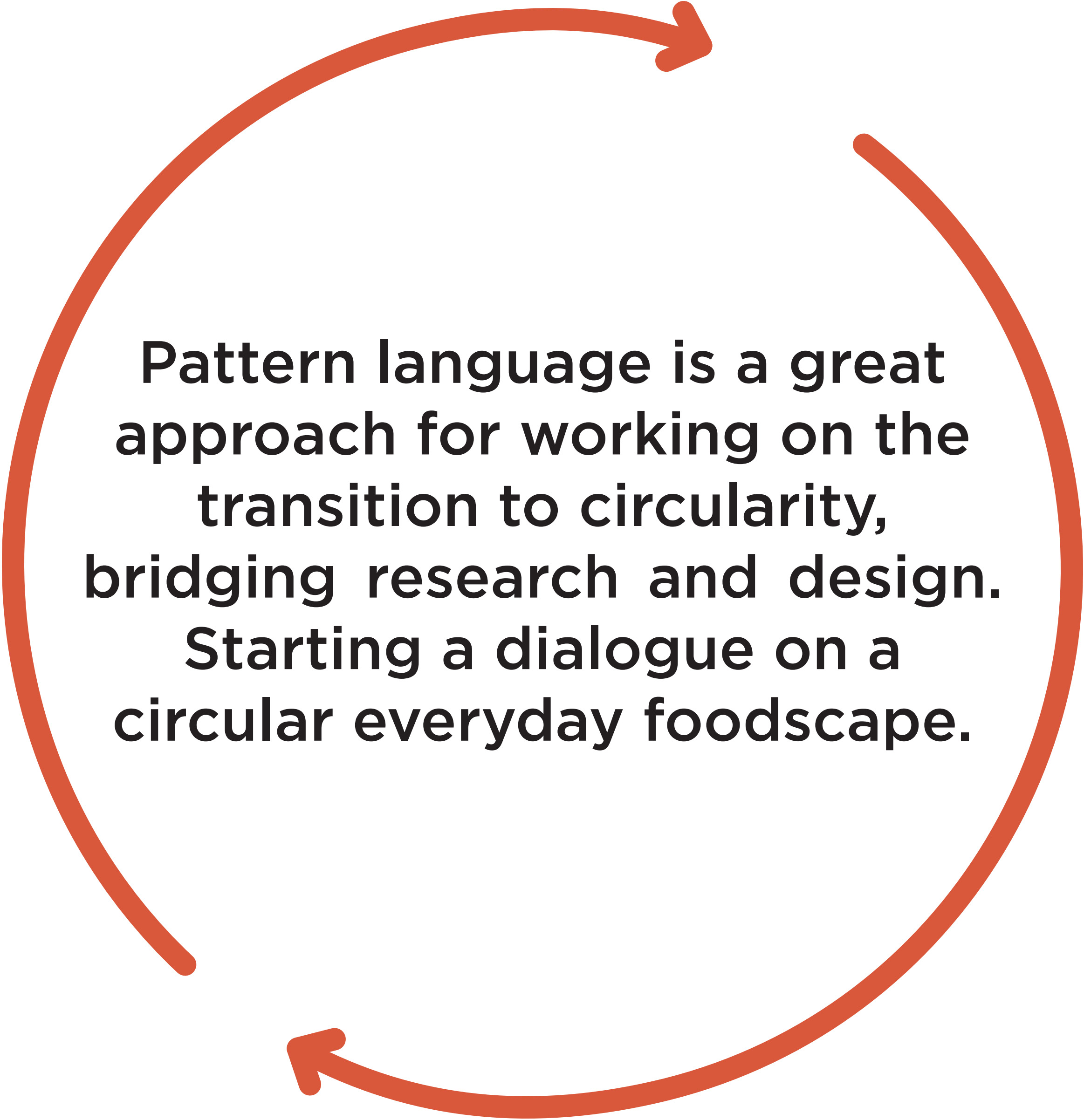
Urban structure



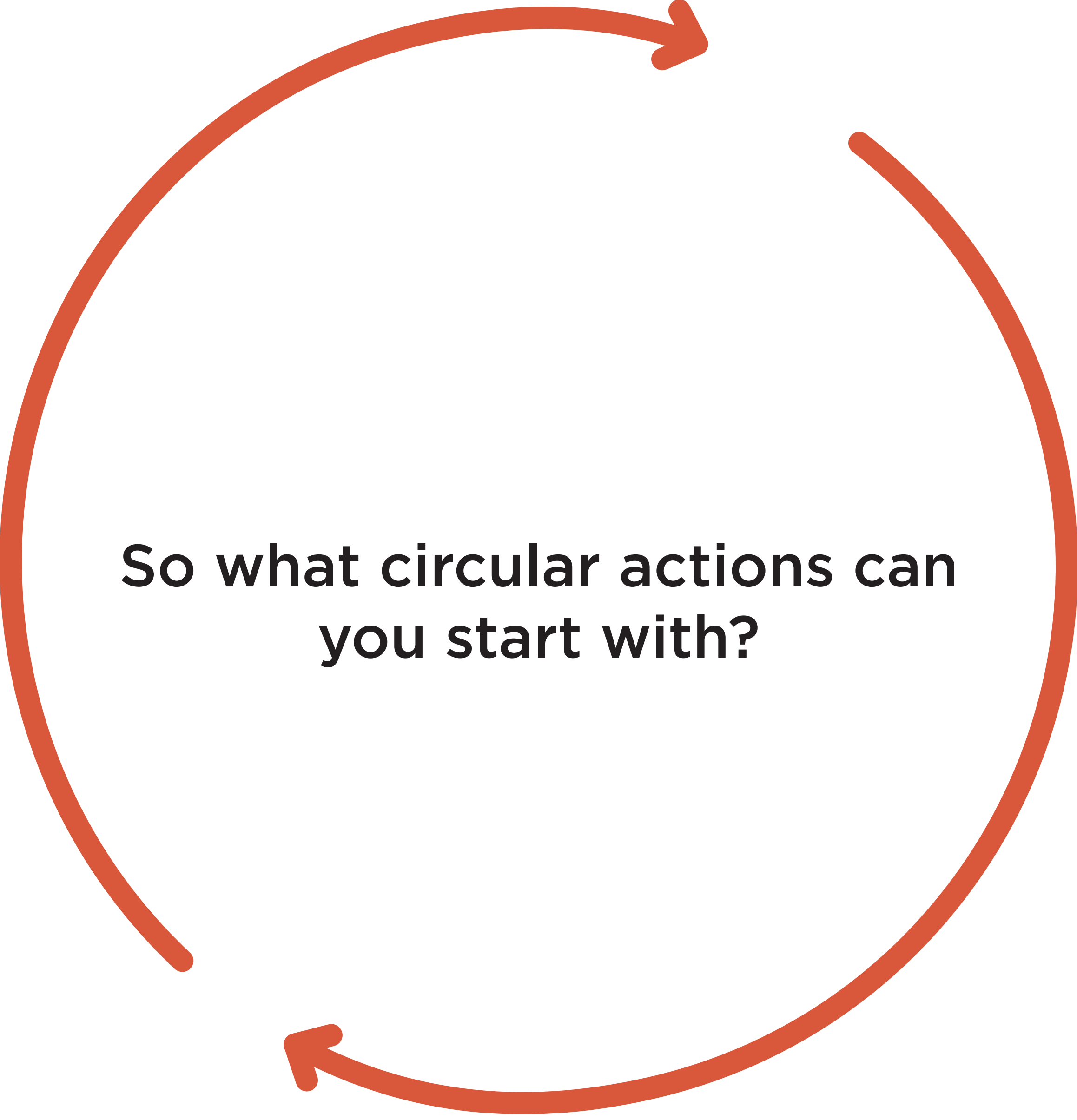
SUSTAINABLE DEVELOPEMNT GOALS (SDG)

How does the circularity of the everyday support the SDGs?





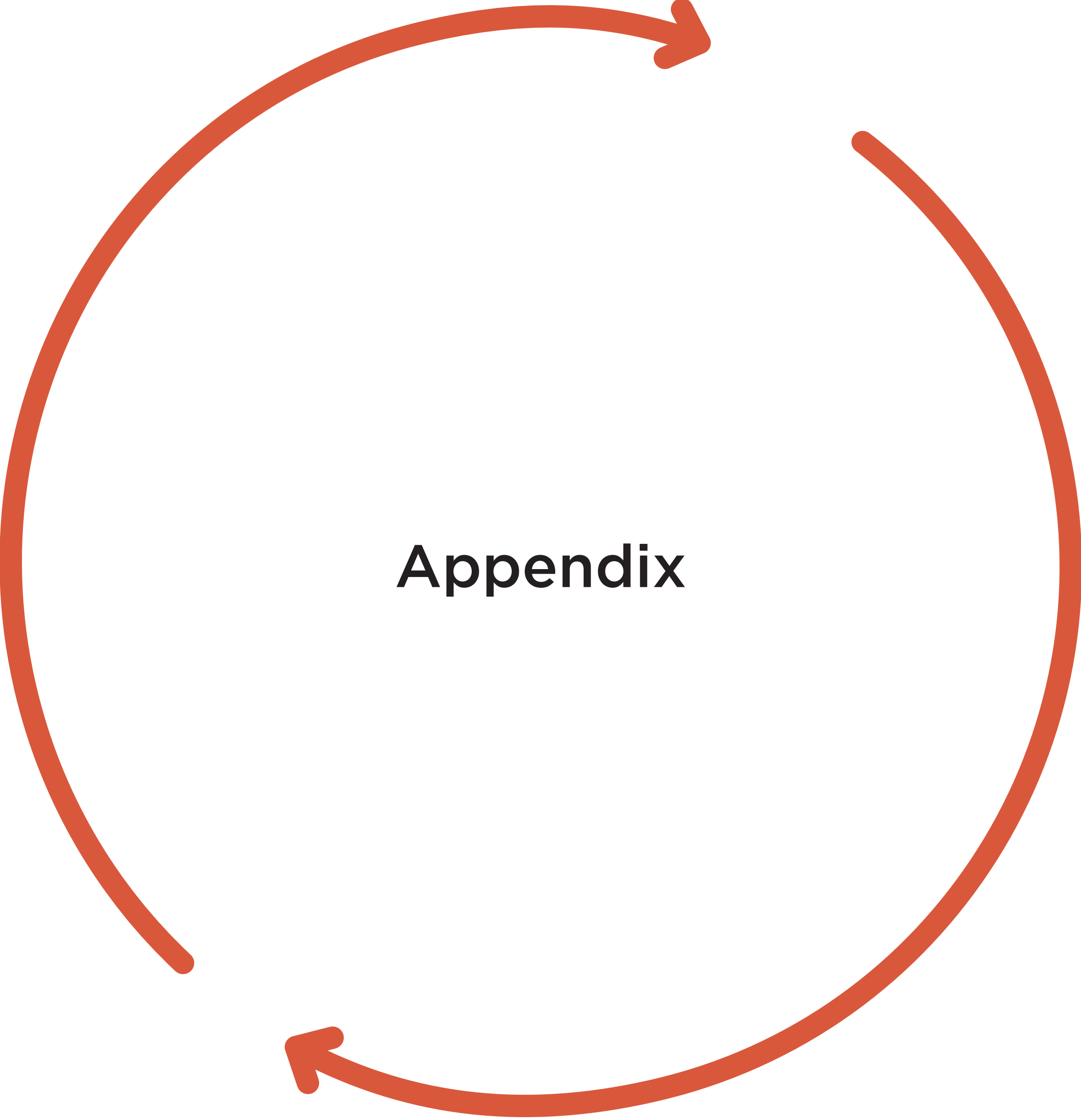
**Pattern language is a great
approach for working on the
transition to circularity,
bridging research and design.
Starting a dialogue on a
circular everyday foodscape.**



**So what circular actions can
you start with?**

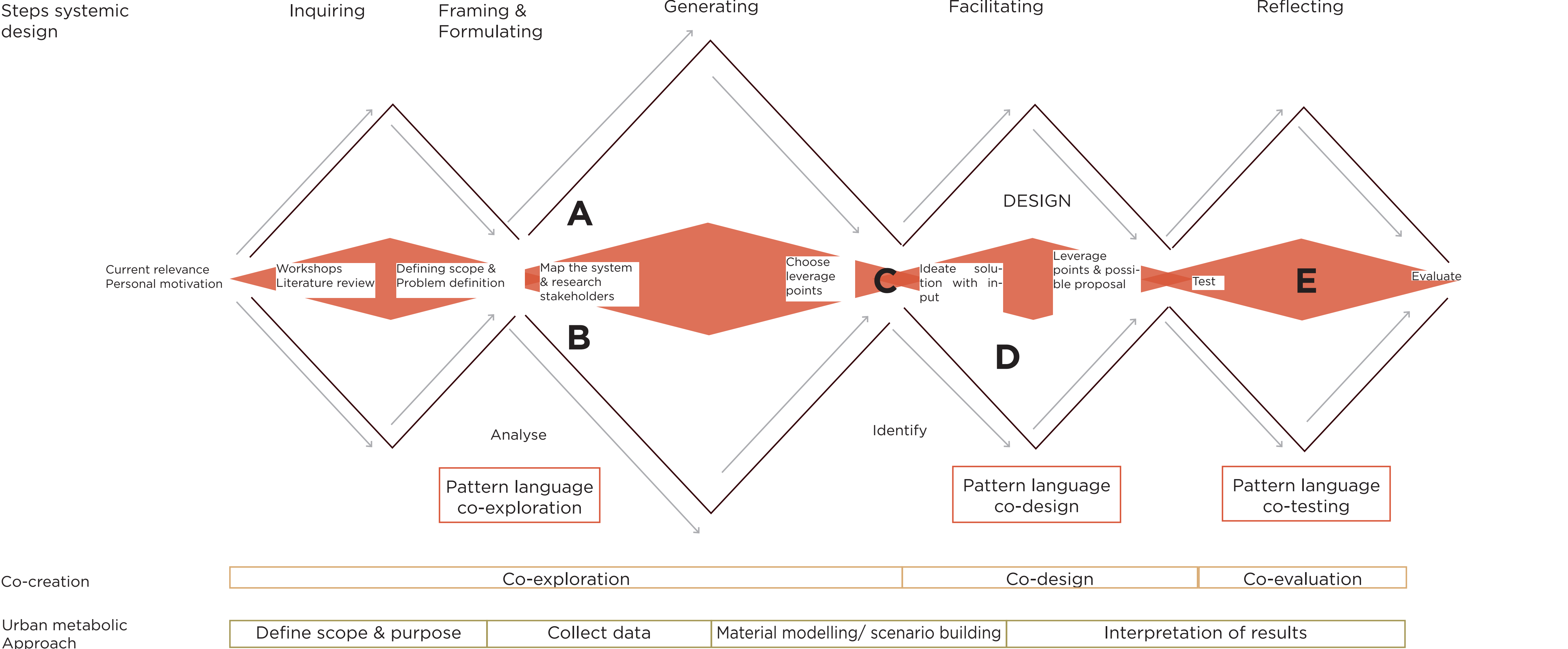


Thank you for listening!

A large circular arrow diagram with a thick orange line. The arrow starts at the top right, curves clockwise, and ends at the bottom left, with a small arrowhead pointing in the direction of the curve. The word "Appendix" is centered within the circle.

Appendix

RESEARCH & DESIGN APPROACH



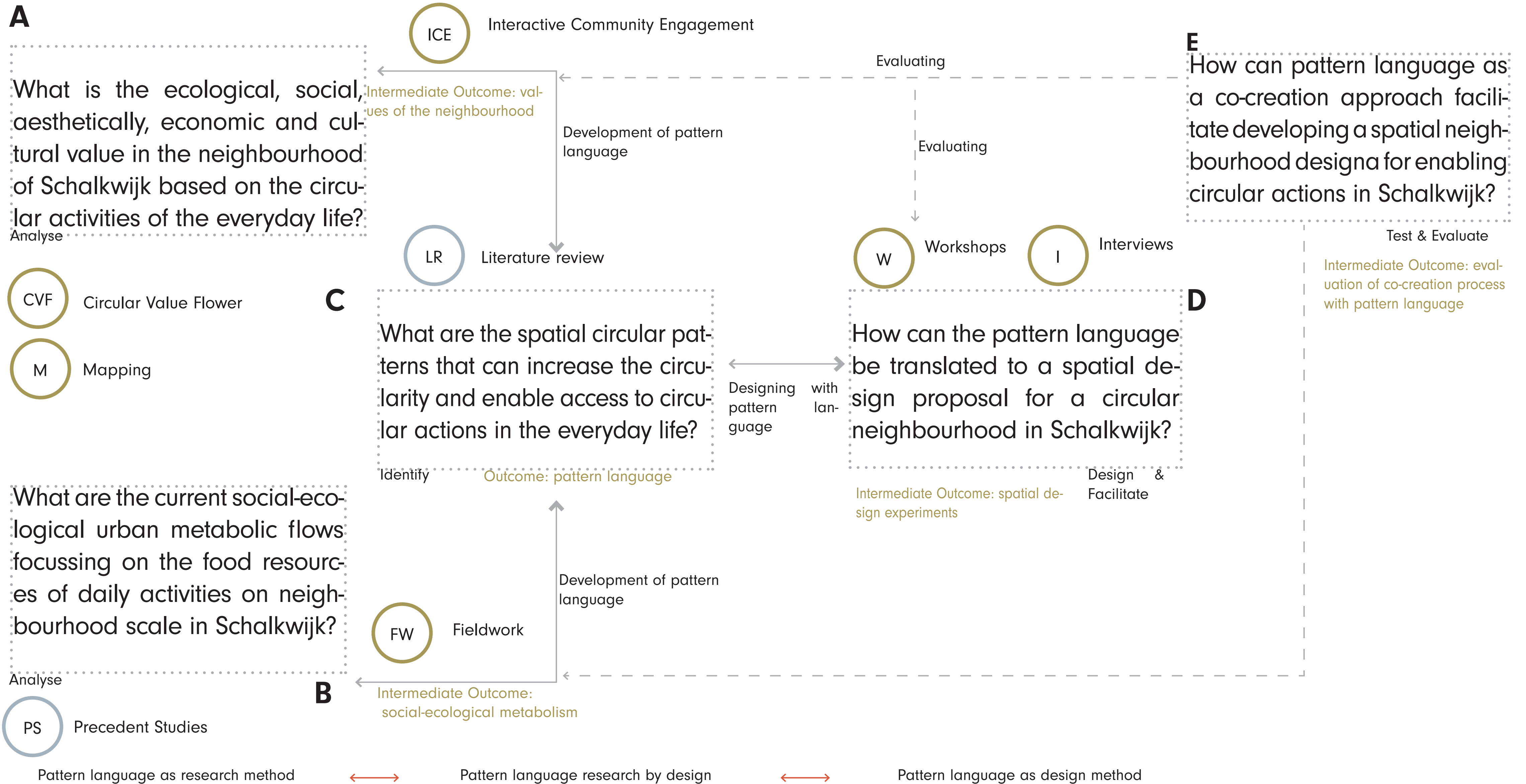
84/ 72

ECOLOGICAL NETWORK

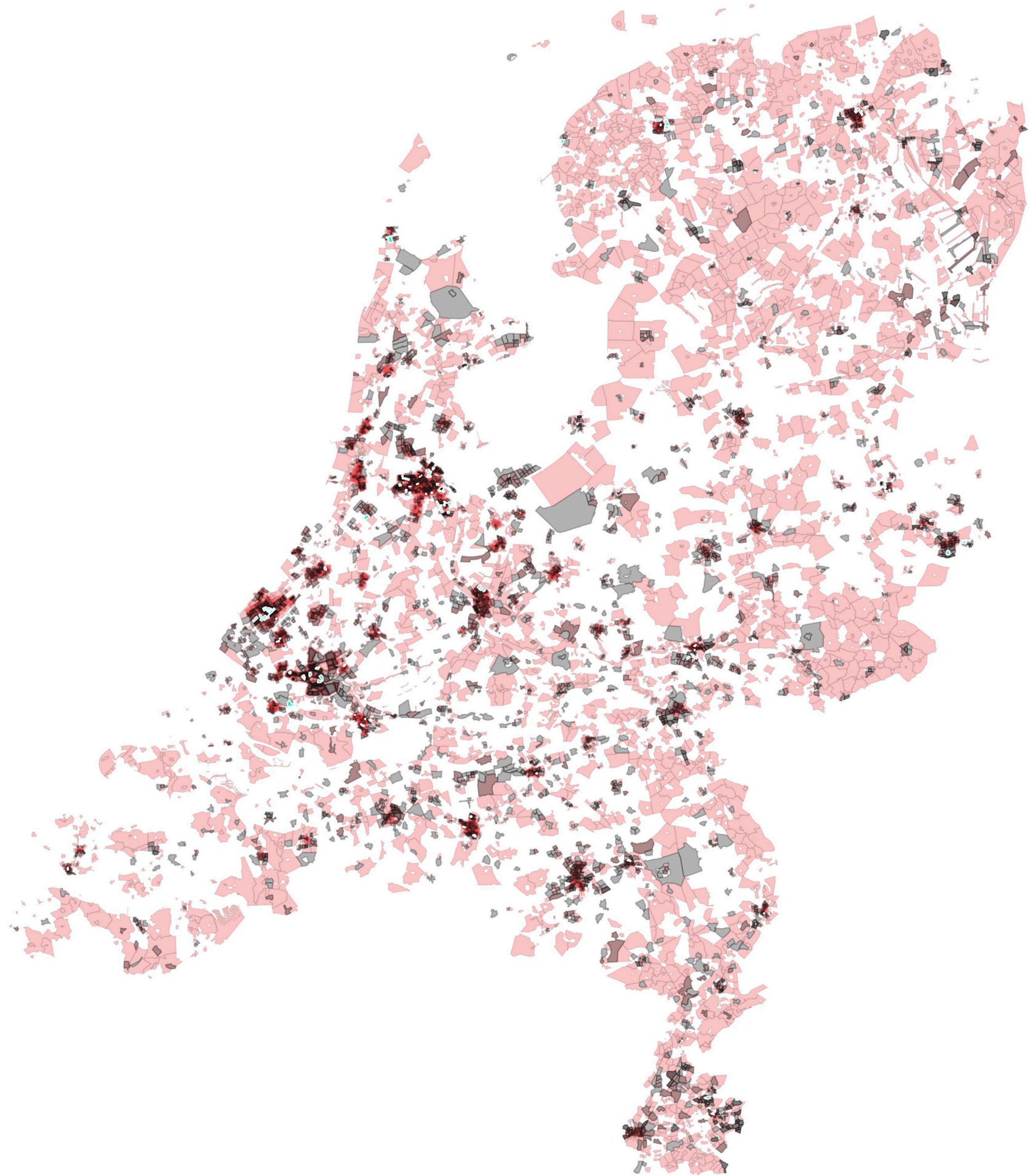


INFRASTRUCTURAL NETWORK

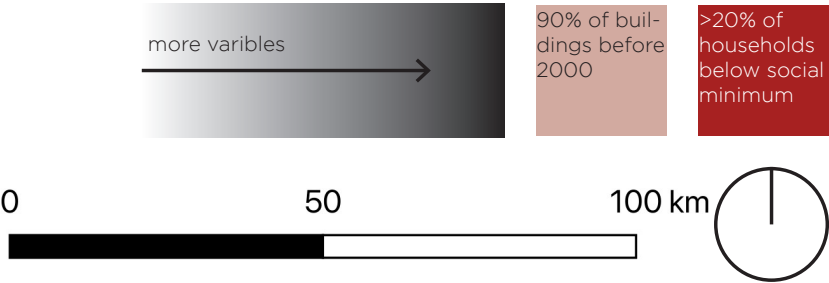




SOCIO-SPATIAL CHALLENGES IN THE NETHERLANDS

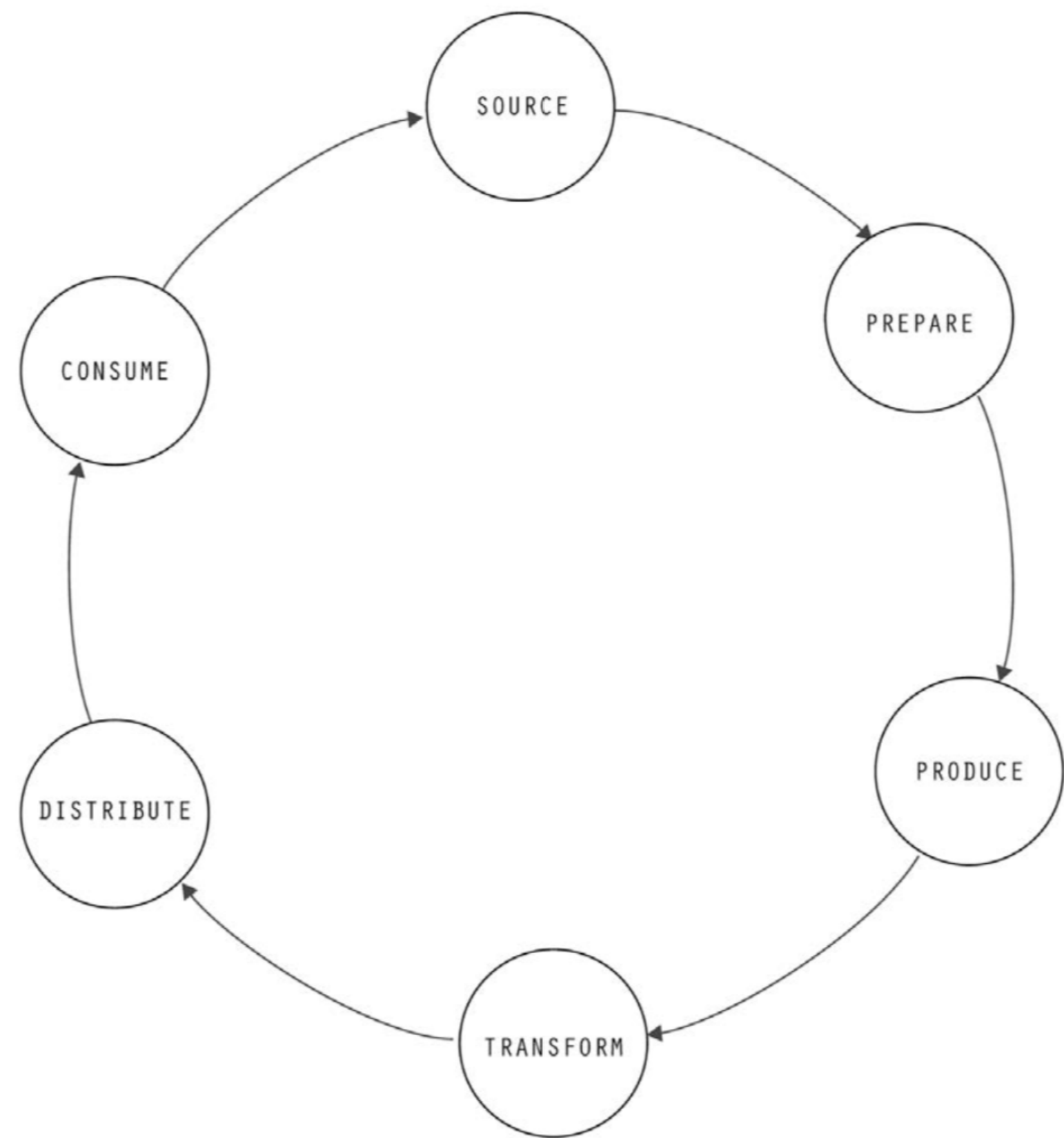


Map of the Netherlands with chose neighbourhoods according to defined variables, based on information of the Wijk- en buurtkaart 2022, made by author



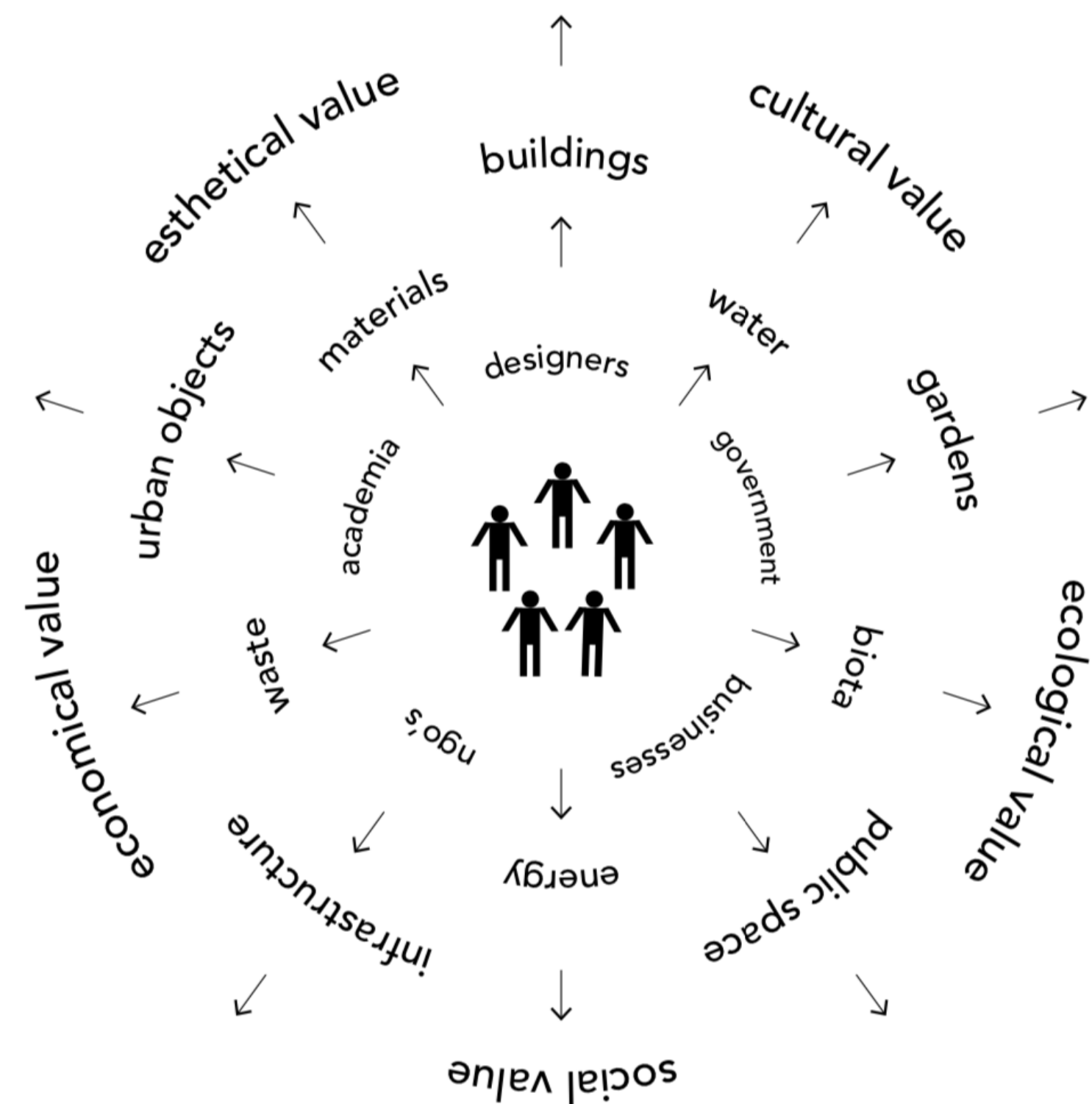
THE CIRCULAR EVERYDAY FOODSCAPE

ACTIONS



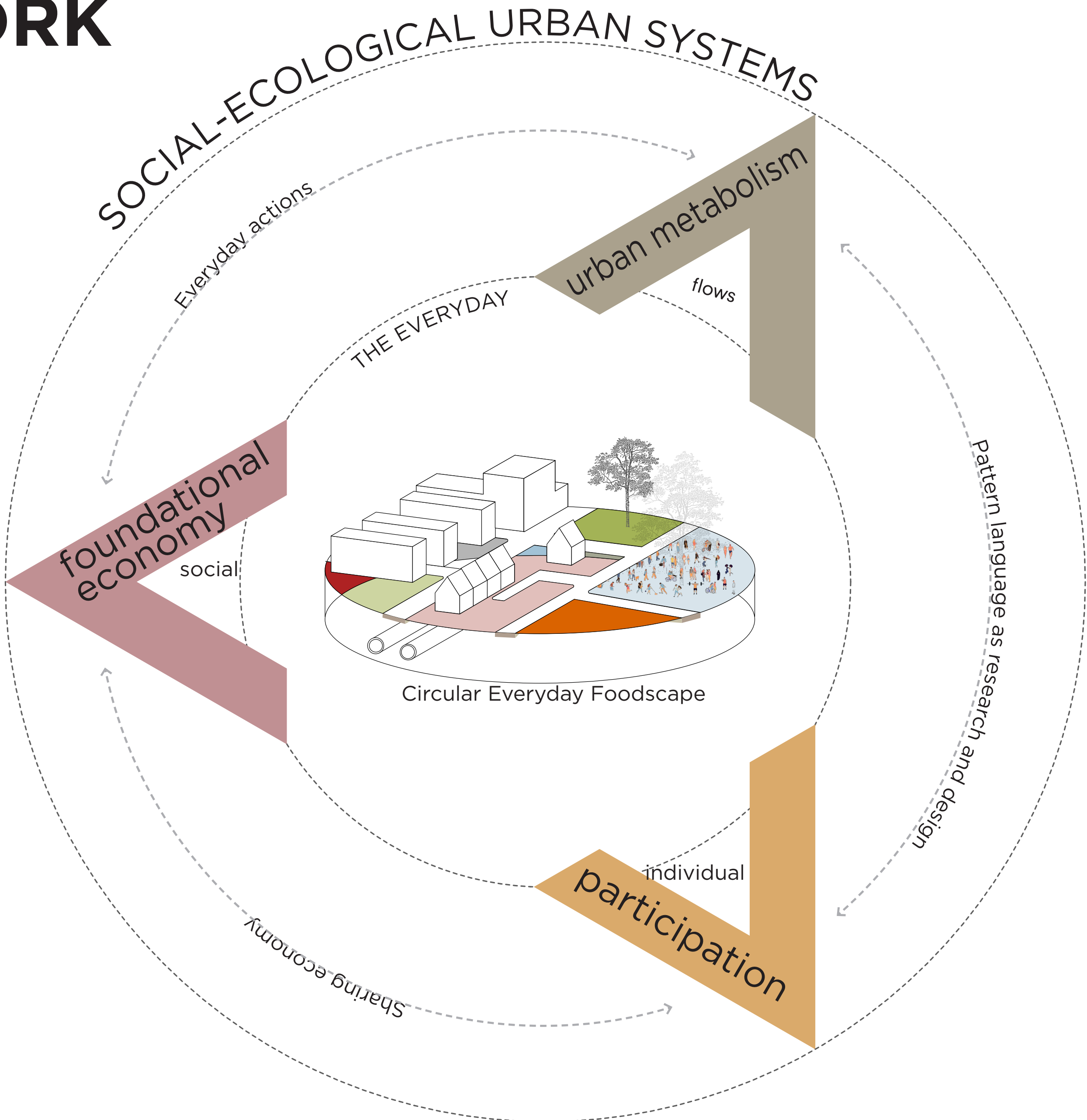
6 step cycle of urban agriculture / agroforestry
source: Jacques Abelman-Master of Landscape Architecture-Urban Lace
Published on Oct 7, 2015

& VALUES



The value flower
source: Circular Communities: The circular value flower as a design method for collectively closing resource flows (2023) by Leclercq & Smit

CONCEPTUAL FRAMEWORK



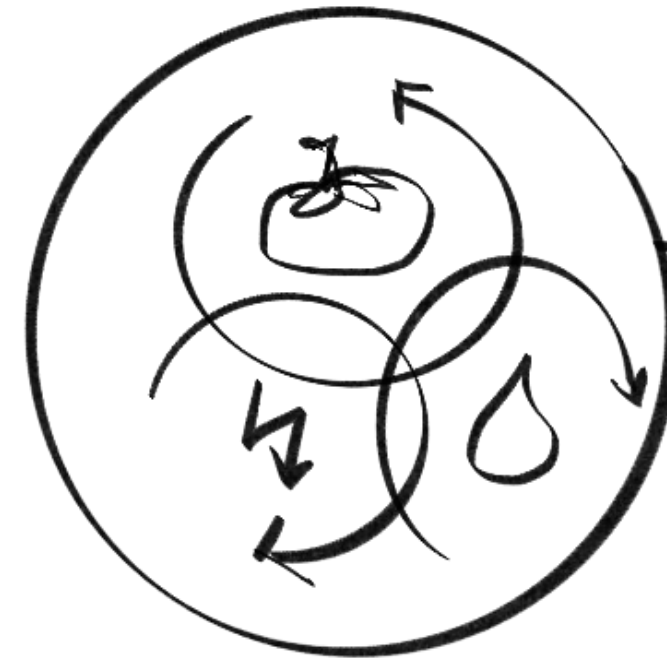
SOCIO- ENVIRONMENTAL CHALLENGES



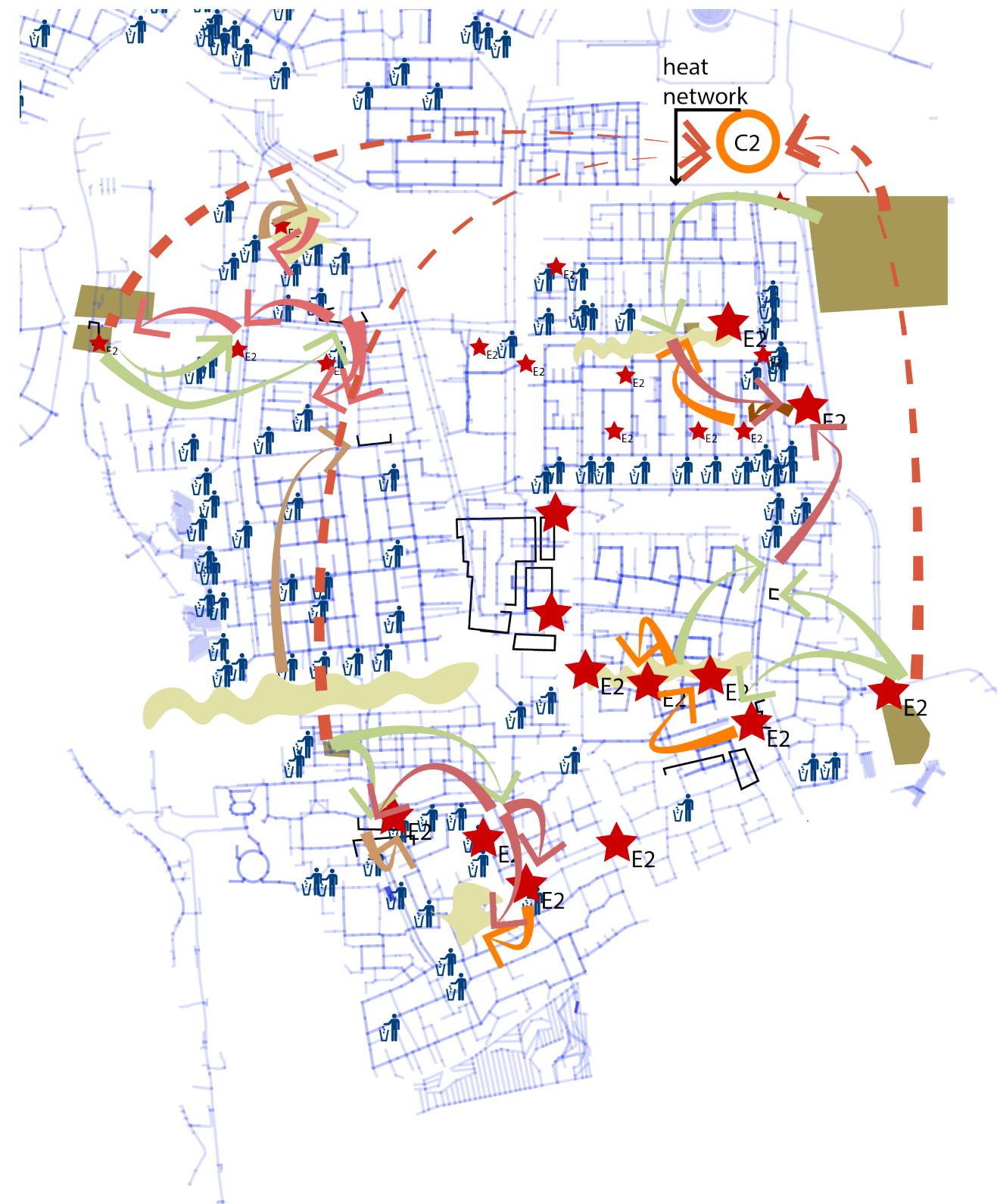
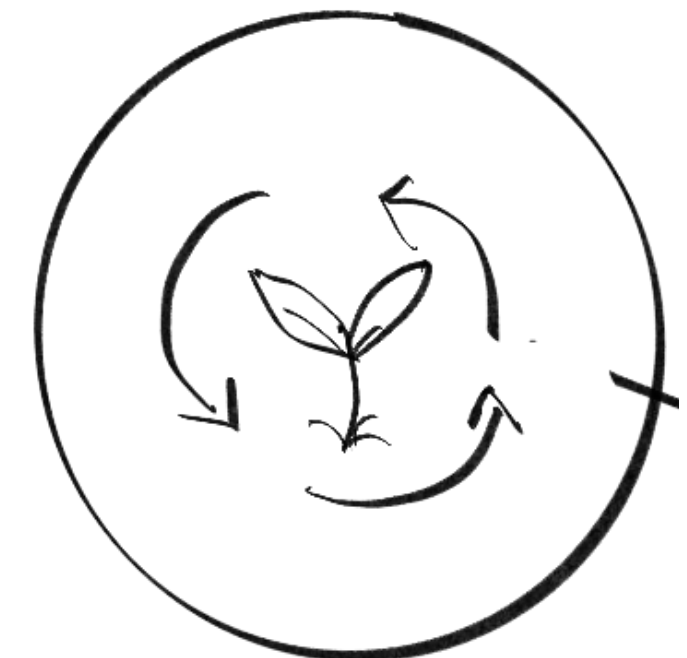
BIODIVERSITY



NO FOOD WASTE

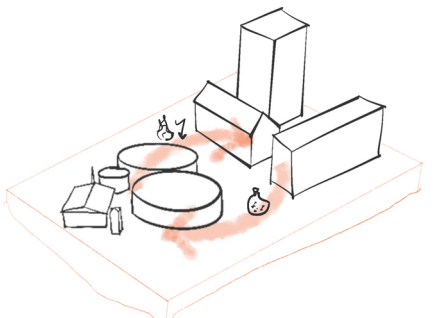


ACCESSIBLE FOODSCAPE



DISTRICT BIOGAS SILO

C.2



A District biogas silo would play a crucial role in closing the loops of a circular food system by shortening the distances for the infrastructure needed to transport waste and heat.

Connected patterns: C3,C5, S2, S4, S6, S7, S8, S9, C8, C10, C11

F
W—E

FOOD NETWORK

C13



Establishing a neighbourhood food network that is easily accessible to everyone, well-connected to public transport, and designed with pedestrian-friendliness in mind promotes convenient access to fresh, local produce.

Connected patterns: P1, P4, E4, E5, S6, S10, S11, E8, S12, S15, C13, S15, P12, E12

F
W—E

SUPERMARKETS AS PIONEERS

C40 P.16



Supermarkets acting as pioneers in adopting short supply chains, local sourcing, and advocating to reduce and eliminate food waste by cooperating in local food sharing strengthen and support that within the neighbourhood

Connected patterns: P2, P3, P10, P11, C13, S14

F
W—E

PROSUME !

loc BR P.1



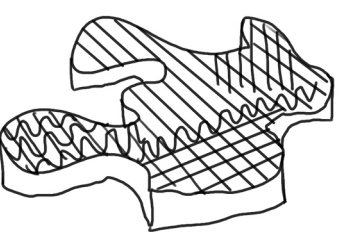
Consumer behaviour is changing towards a circular food system by transforming from a 'consumer' to a 'prosumer', by developing a high level of engagement in food production and an awareness of the long-term sustainability aspects of their food consumption.

Connected patterns: P2, S1, P3, P4, E1, E2, E4, E5, P5, C4, S2, S3, S8, S9, P6, P8, P11, S12, C13, S15, P12, E10, W—E, P13, P14, P15, P16

F
W—E

FLEXIBLE SPACES FOR FOOD PRODUCTION

FoIF S.12



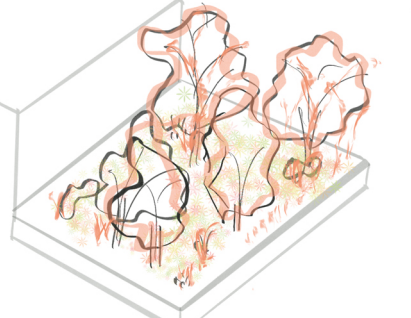
Flexible spaces for food production in the neighbourhood and periphery can provide space for innovative urban agricultural systems by adapting to changing needs and seasons

Supports agricultural coops, shared circular infrastructure,

E1,E4, E5, P2, S11, P6, P7, E7, E8, P8, C9, P10, P11, S13, E9, C13, S14, S18, P12, E10, P13, S20, E12

WILD PUBLIC GREEN

GB E.9



Having public wild green spaces can benefit fostering biodiversity, providing recreational opportunities, and promoting environmental conservation - with minimum need of maintenance and energy

Connected patterns: E4, E5, C5, S8, S11, P6, E6, P7, C13, S16, P12, E10, P13, E11

F
W—E

Ecological Network



People Network



Infrastructural Network



People Network



2.2. THE NEIGHBOURHOOD AS A SYSTEM

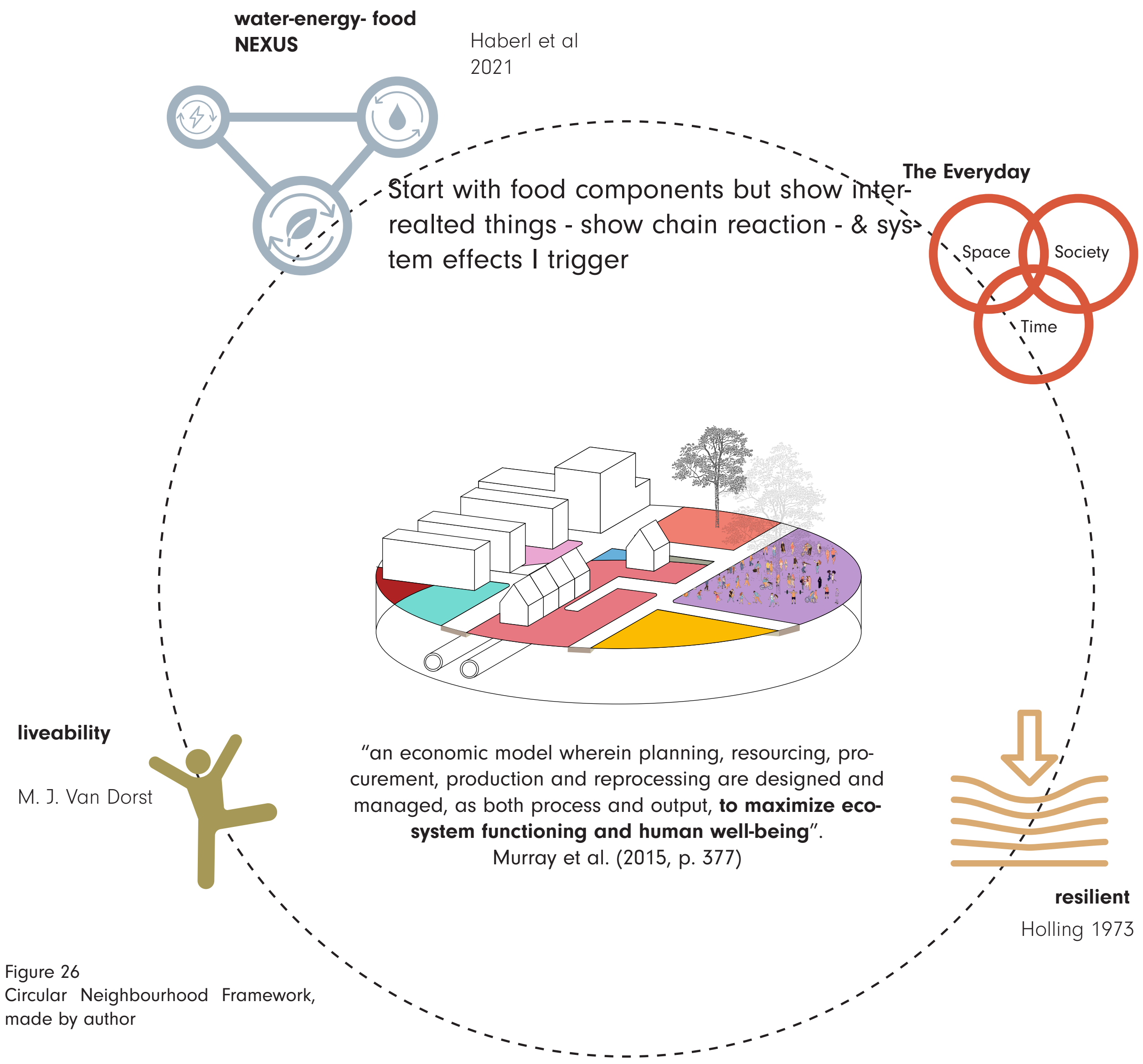


Figure 26
Circular Neighbourhood Framework,
made by author