TEXTILE LANDSCAPE

A design exploration to understand the spatial dimensions of a local , circular textile ecosystem in Noord-Brabant.

P5

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Personal motivation: Myths of Fast Fashion

High consumption patterns

Photo, left: Anneke Lute, Zara : Fast Fashion (case study), Faect, 25 Juli 2017

Photo, right: Mango Windows, Retail Design Blog, 18 Augustus, 2012

Personal motivation: Myths of Fast Fashion

High production patterns

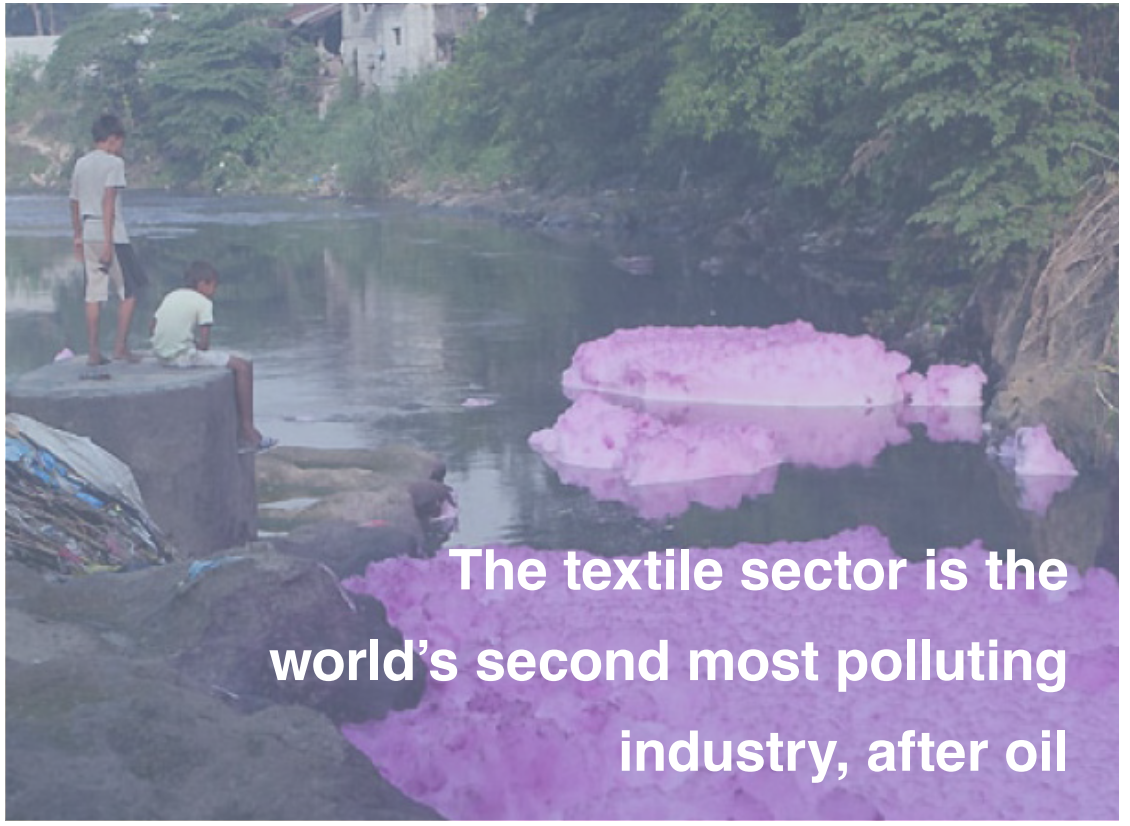


Photo: Martin Bernetti / AFP

Source: Metabolic (2018), A circular vision for the Taiwanese textiles sector

Spatial implication: Textile industry

Global context

Photo: EcoAge, Decolonising Fashion, The landfill site in Kpone is oversaturated with textile waste, Credit: The OR Foundation

Spatial implication: Textile industry

Global context

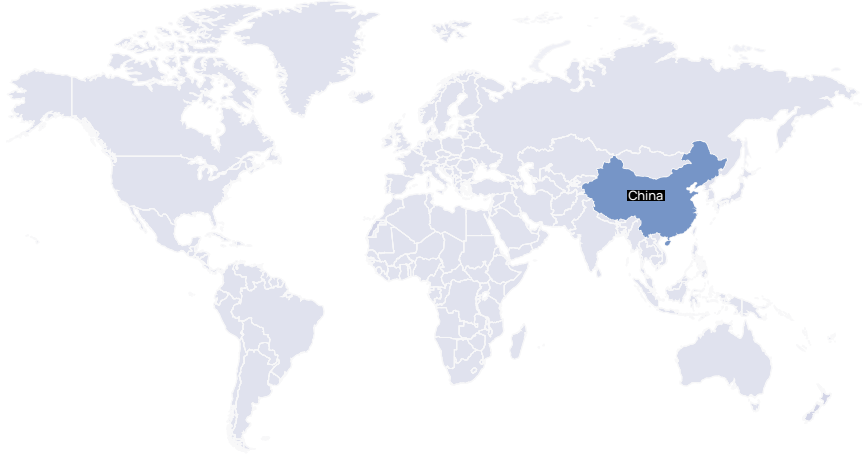


Photo: SANVT, The environmental impact of dyes in fashion, Paulina Kulczycki , 09.01.2019

Spatial implication: Textile industry

Dutch Context

Photo: SoulStories, Duurzame Nederlandse wol vind je bij The Knitwit Stable, Talita Kalloe, 11.09.2021

Spatial implication: Textile industry

Dutch Context

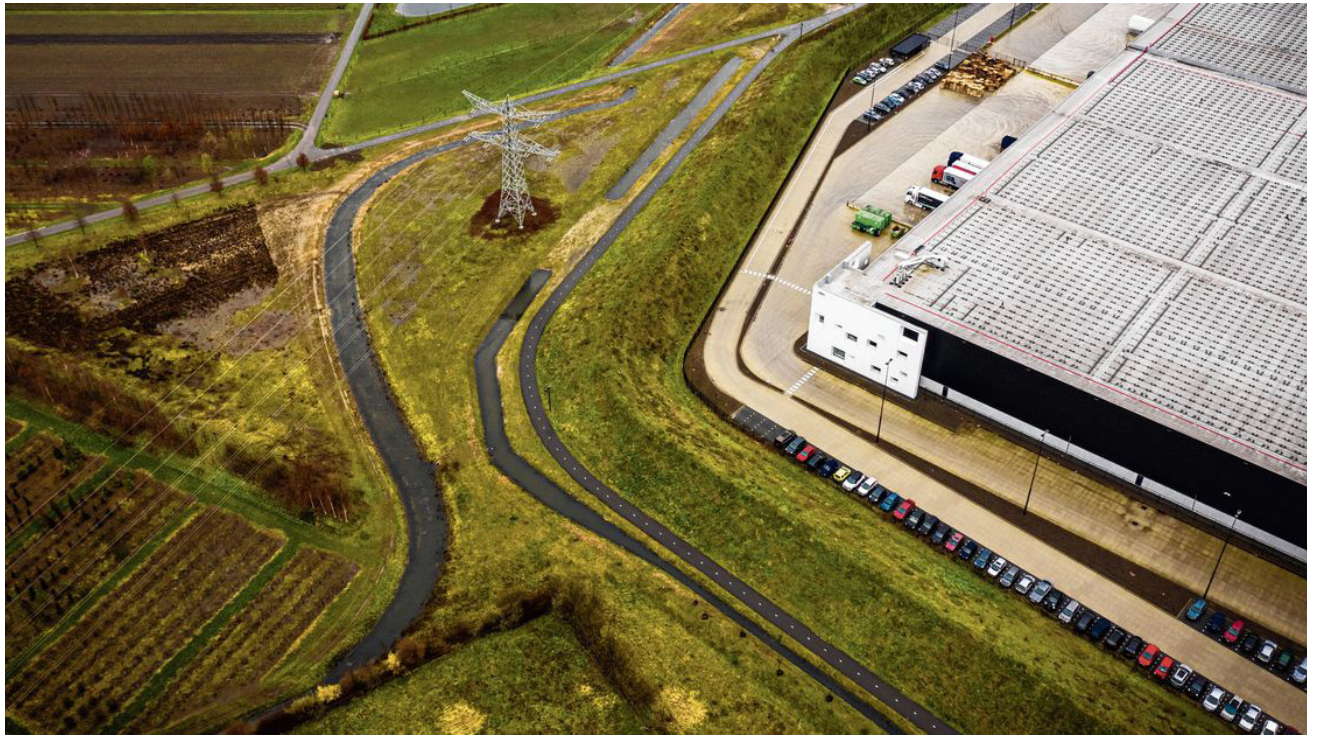
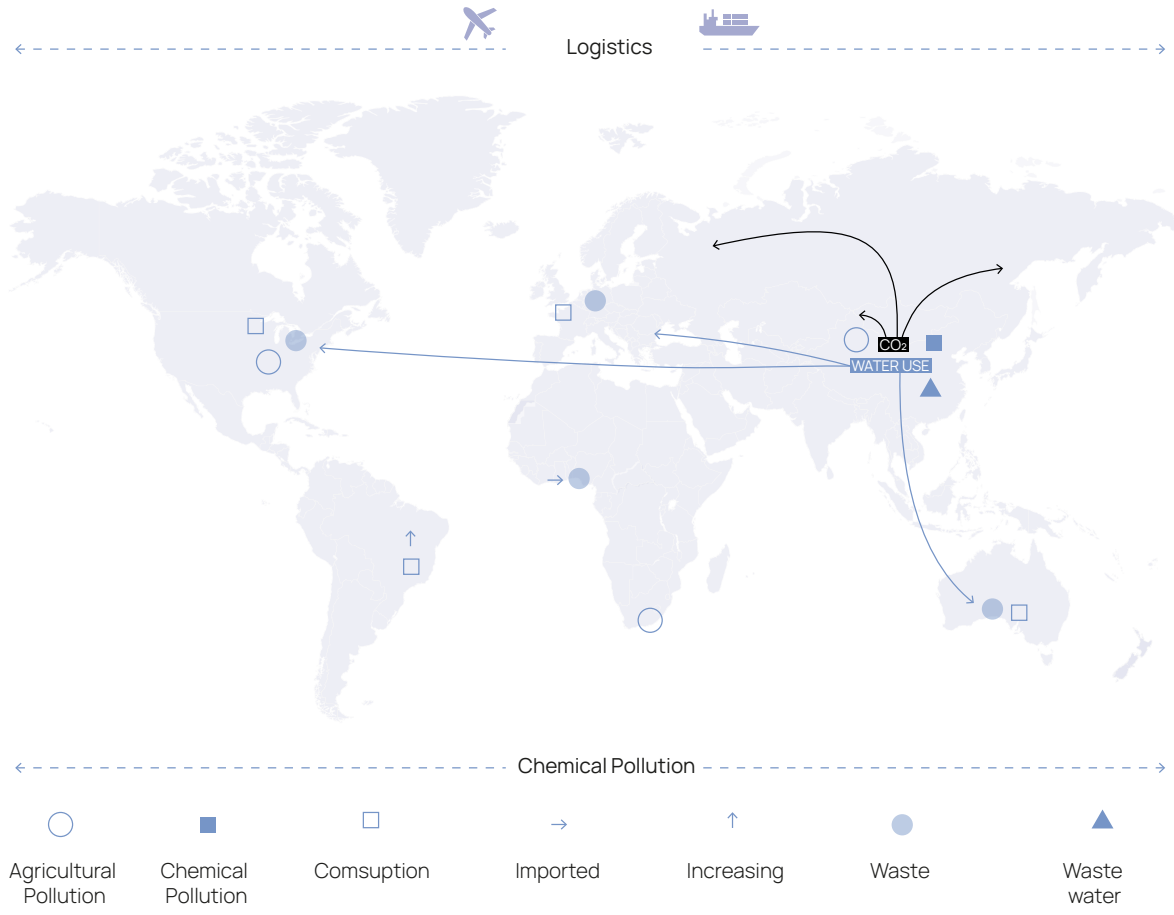


Photo: NRC,Noord-Brabant sluit "achterdeur" voor bouw distributie centra, Cossette Molijn, 03.02.2021

Critical points of the textile value chain

Global textile industry



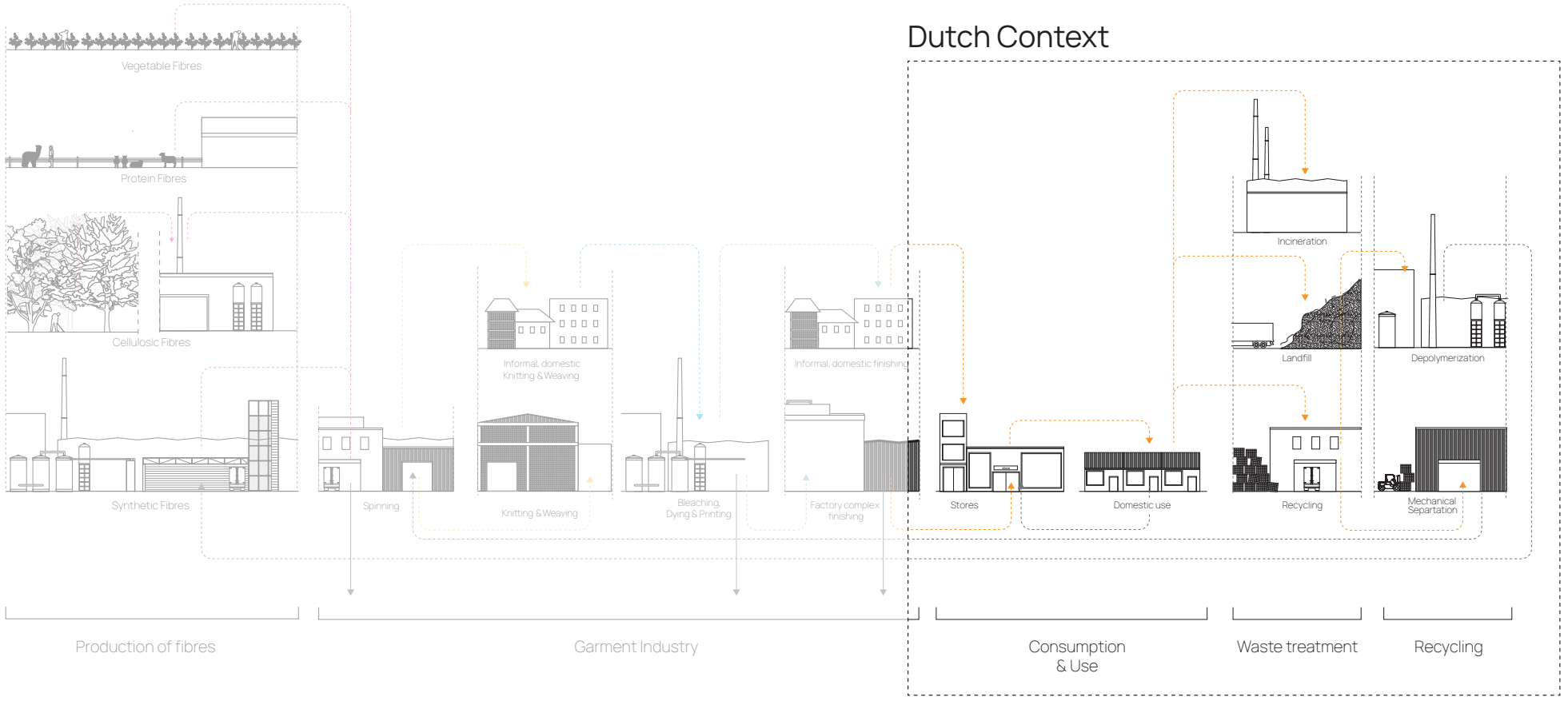
Source: Altered from: Niinimaki & Dahlbo (2020)

Metabolic imbalance:

The phenomenon in which a certain process has become separated in such a way (spatially, socially, economically and/or ecologically) that we have lost sight of how different activities influence each other.

Textile value chain: Metabolic imbalances

Separation production, consumption



Research Intention

Formulating the patterns

Photo: Milieu defensie, Recycling bin

Photo: Textile waste and old clothing is embedded into the sand of the beaches around Accra, Credit: The OR Foundation

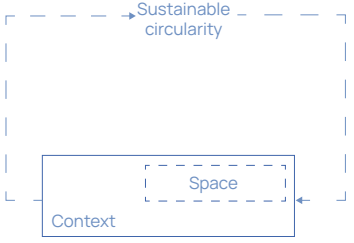
Photo: ABC.net.au, Linton Besser, 21 Octber 2021

Sustainable Circularity:

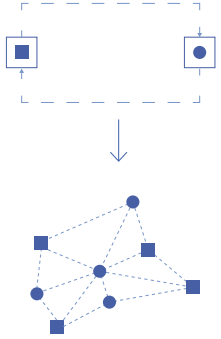
"Sustainable circularity not only closes material cycles but also responds strategically to complex intertwined social and ecological pressures. Sustainable circularity promotes adaptive responses from societies and businesses that recognise the many cross-scale links among social and ecological dimensions." Palm et Al. (2020)

Knowledge gap

1



2



GAP: There is little theoretical understanding of how to overcome metabolic imbalance with circularity this is due to the lack emphasis on:

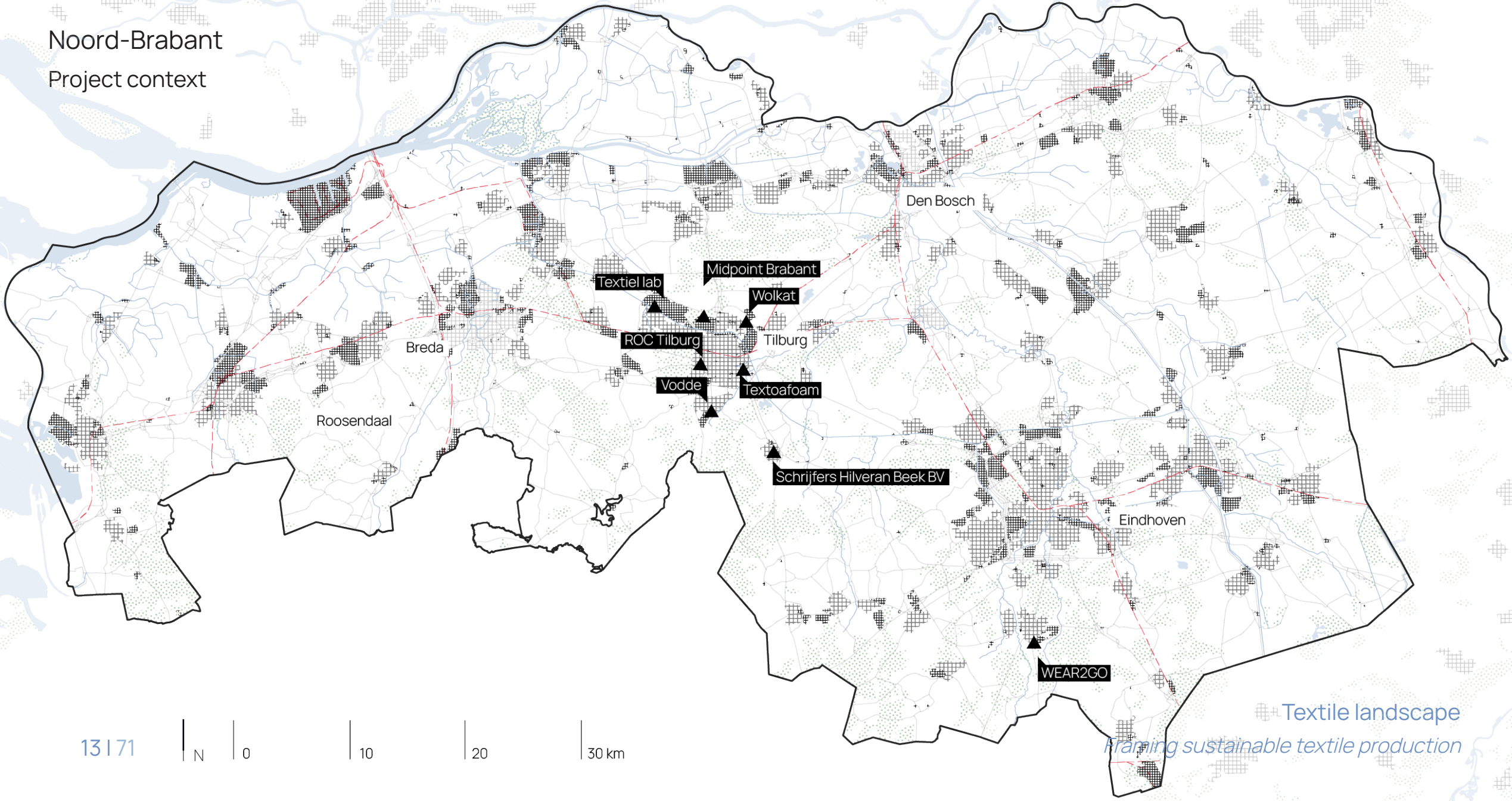
1. Spatial and contextual implication of circularity

2. Systemic understanding of the context

AIM: To examine how implementing spatial circularity for textile production can help to achieve a sustainable region, and how the local context can help to facilitate this.

Noord-Brabant

Project context



Research Intention

Research question & objective

How should the urban landscape of Noord-Brabant be configured to overcome the metabolic imbalance with spatial circularity in the textile industry, while achieving its own sustainability?

Research Intention

Objectives

1. **Formulate** the elements that you need for a local, sustainable circular textile ecosystem

2. **Understand** how the context can facilitate a new ecosystem

3. **Establish** a network of solutions

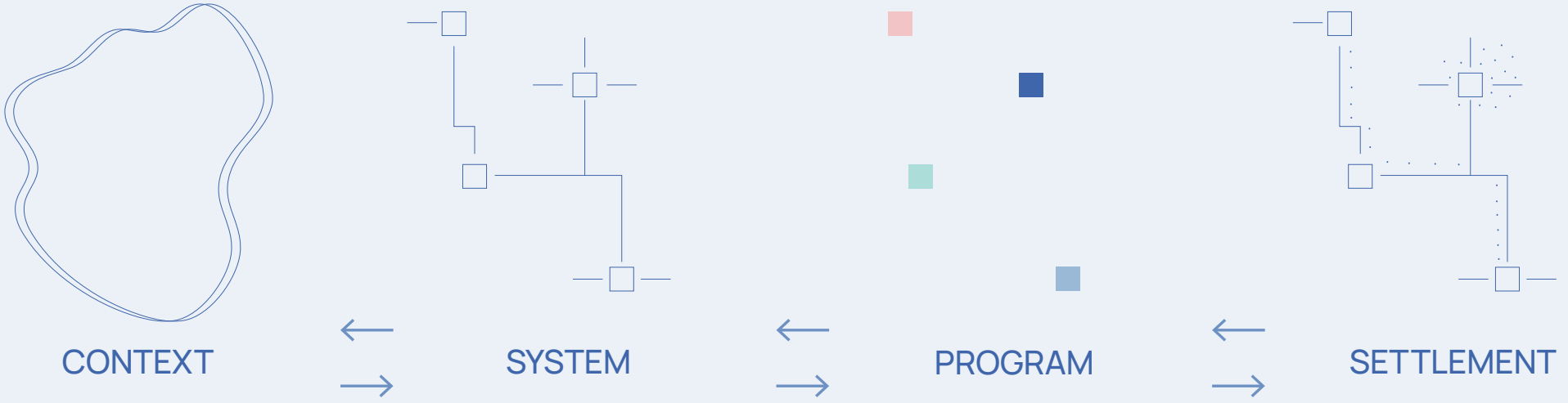
4. **Value** the network of solutions and find a hierarchy in the solutions which helps the context achieve its sustainability goals

5. **Reflect** on the design practices and formulate recommendations for the future

1. **Formulate** the elements that you need for a local, sustainable circular textile ecosystem.

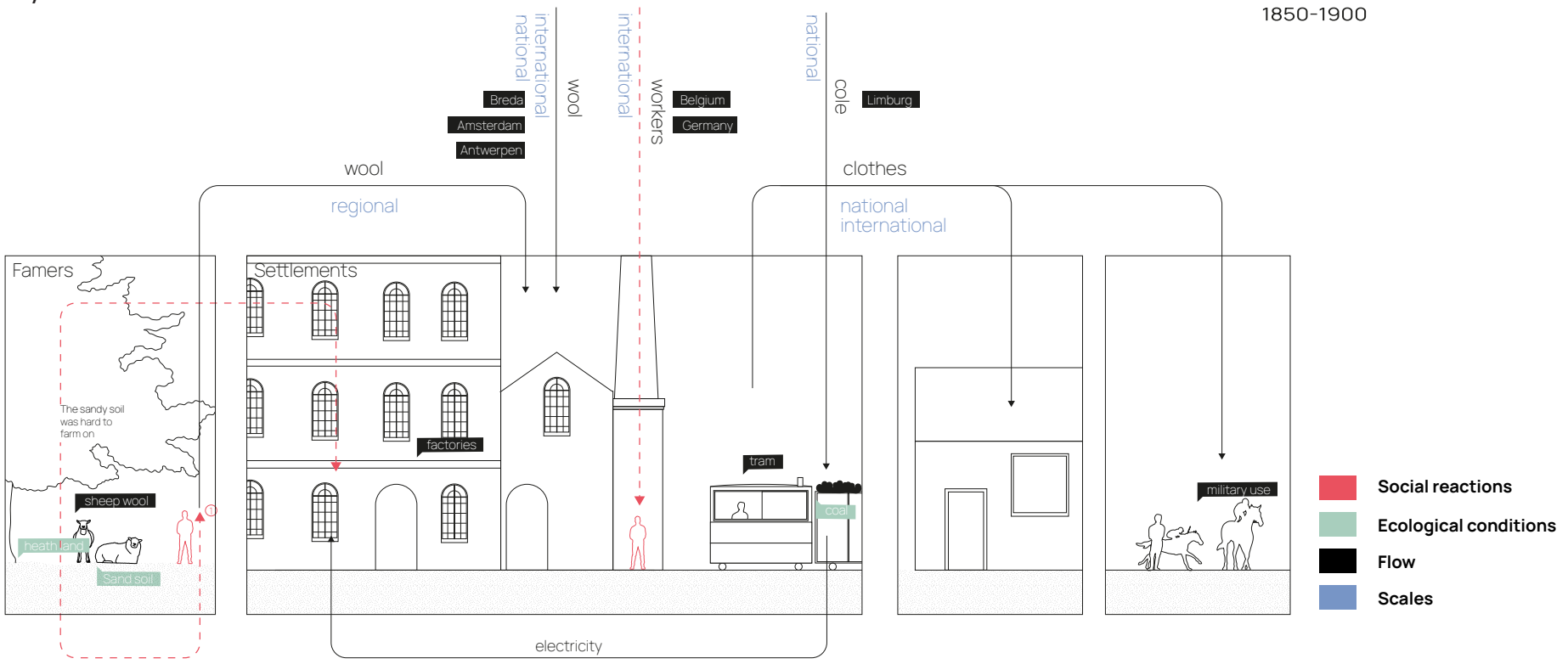
Understand the influence of the context

Diachronic analysis



Understand the influence of the context

Diachronic systemic analysis



Own illustration

CONTEXT ← → SYSTEM ← → PROGRAM ← → SETTLEMENT

Understand the influence of the context

Patterns of work

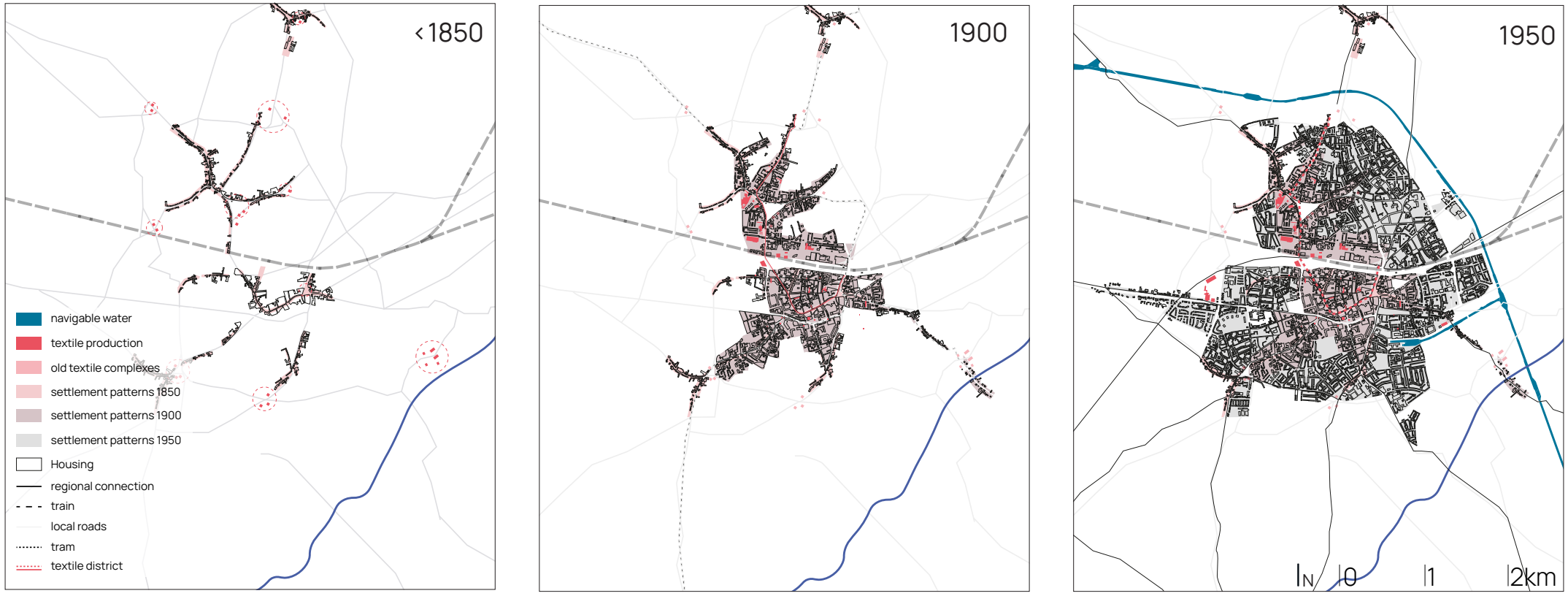
Source: DBNL, Cultivation of Meekrap at the Clay soil in West Noord-Brabant .

Source: DBNL, Textile Factory

Understand the influence of the context

Urban morphology formed by production activities

Tilburg



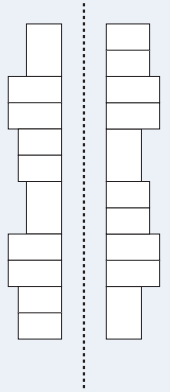
Own illustration

Offer all education levels and domains related to textile production

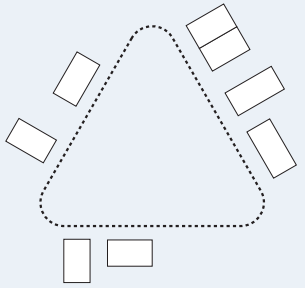
Offer the possibility for informal knowledge transfer

Take possible growth and changing (spatial) demands of production process into account

Precondition and dimensions



Lint bebouwing



Heerdgang

Spatial relation

2. **Understand** how the context can facilitate a new ecosystem

Design studies

Talking to stakeholders

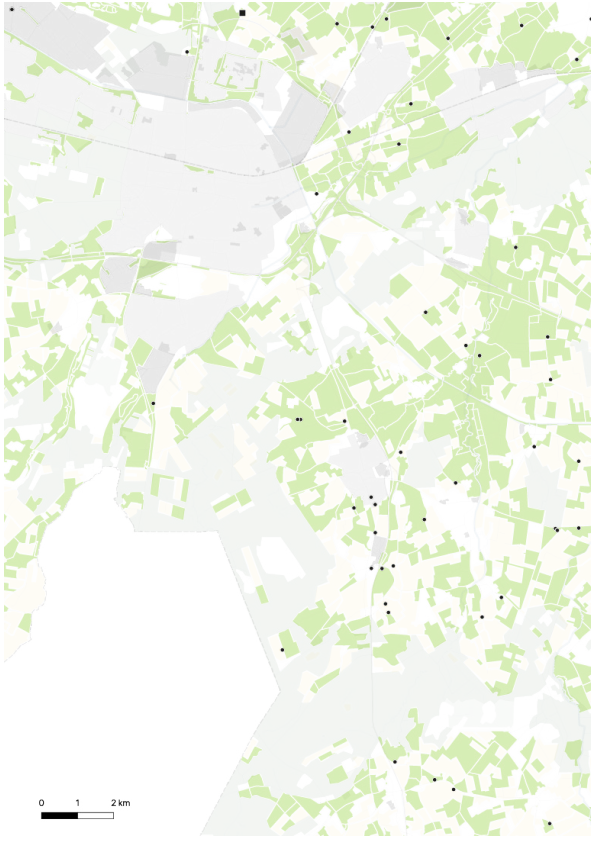
Source: Eindhovens Dagblad (2021) Anne-Laure Klok

“Sheep contribute to the health of the environment through grazing. They help to boost biodiversity on marginal fields and improve soil health during winter grazing. Sheep farming is regarded as a minor industry. At the same time, it is a sector that handles around 2% of the Netherlands’ agricultural land.”

Design studies

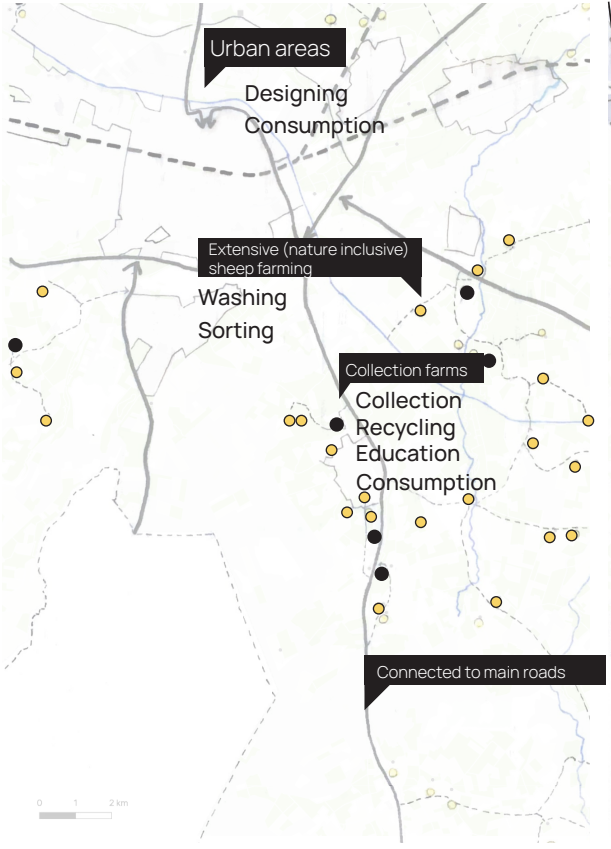
Example: Logistics and infrastructure

Current



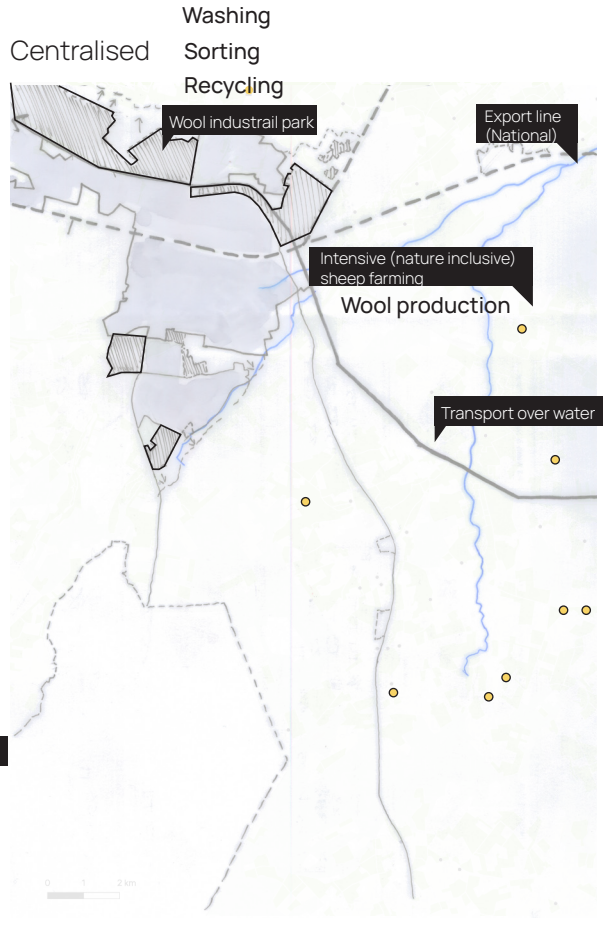
Arable farming
Forest/heathland
Grassland/livestock farming
City/village
Industrial area
Sheep herding

Decentralised



Sheep farms
Hubs

Centralised

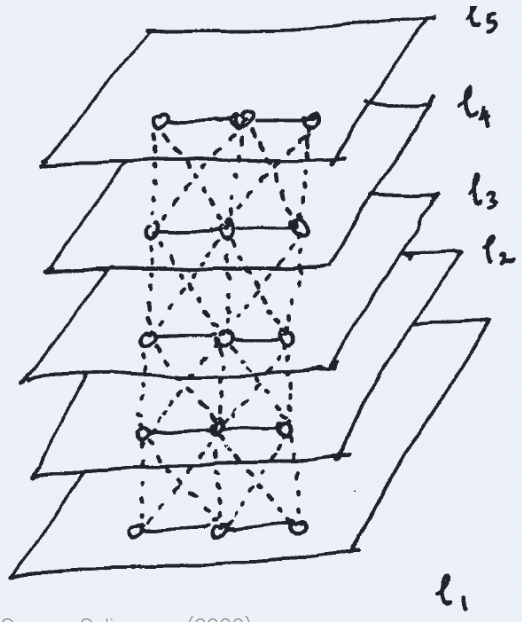


Wool industrial area

Sub question 2

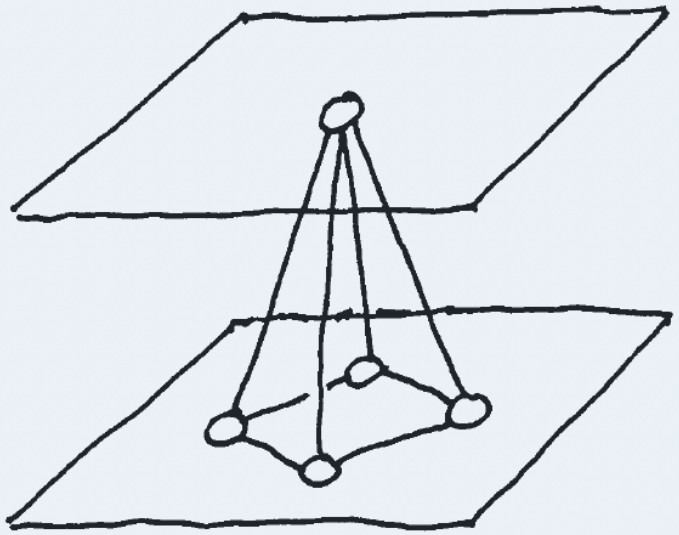
Conclusion

Design solutions are linked through different scales



Source: Salingaros (2000)

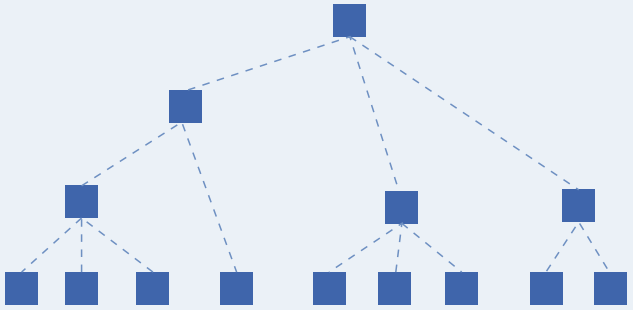
Design interventions at a lower scale help to achieve a goal on a higher level



Source: Salingaros (2000)

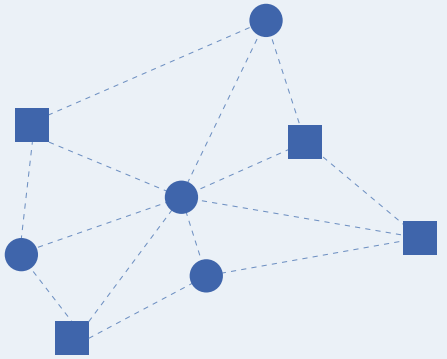
3. **Establish** a network of solutions

A pattern language for a local textile ecosystem



Source: Hausleitner (2021)
Altered by author

A set of requirement organised hierarchically



Source: Hausleitner (2021)
Altered by author

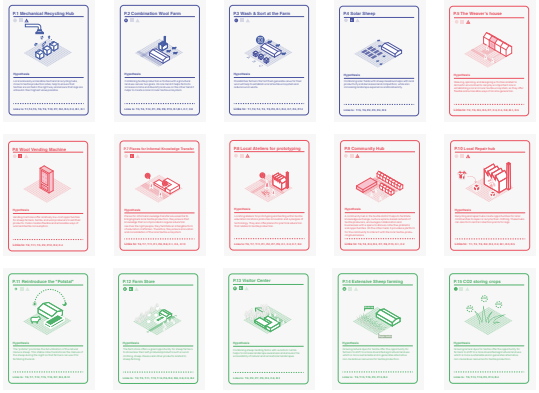
A network of solutions

Generating the pattern field

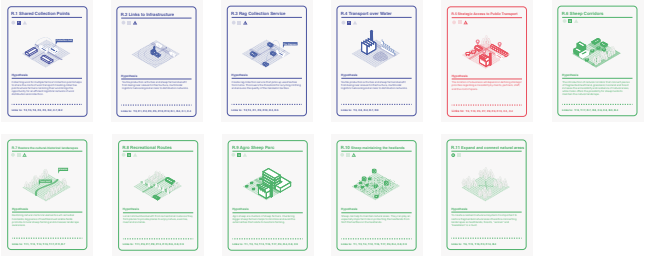
Synthesising research to principles

Transscalar

Programmatic



Regional



City/village

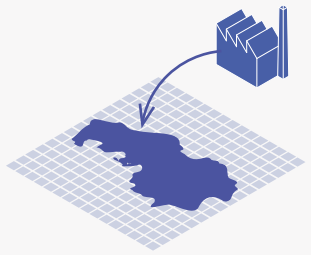
Block/farm

Design/product

Using the pattern languages

Helps to understand the elements of solutions

T.1 Bring back production

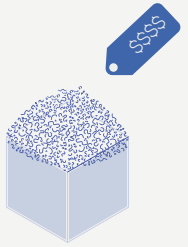


Hypothesis

Bringing back textile production to Noord-Brabant is crucial in oder to create an local circular textile ecosystem. Production activities contribute to opportinities that relate to circularity goals and have positive effects on the development of the local context.

Links to: T.2, T.5, P.1, P.2, P.11, P.14 C.1, C.2, C.4, C.8, R.9, P.4

T.2 Value the Wool



Hypothesis

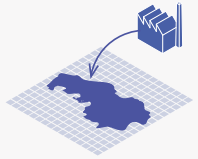
Possibilities farmers that let them generate value for their wool will help to establish a local textile ecosystem and reduces wool waste.

Links to: T.8, T.9, T.12, T.13, T.14, T.17, P.3, P.5, P.12, C.4, D.1

Research Intention

Helps to understand the elements of solutions

T.1 Bring back production



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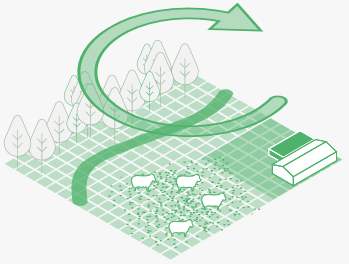
T.14 Circular Sheep Farming

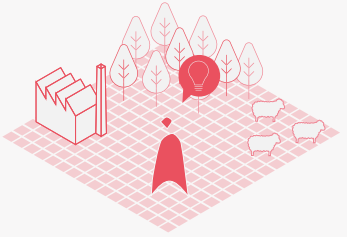


Hypothesis

Sheep Farming Offers a great opportunity to handle resources such as manure and feedstock in a circular manner. Circular sheep farming also allows for a way of farming that closely relates to the local landscape. This way of farming increases biodiversity and restores the elements of the cultural-historical landscape.

Links to: T.2, T.9, T.8, T.14, P.11, C.6, B.3, B.5, D.2

T.9 Indigenous Knowledge



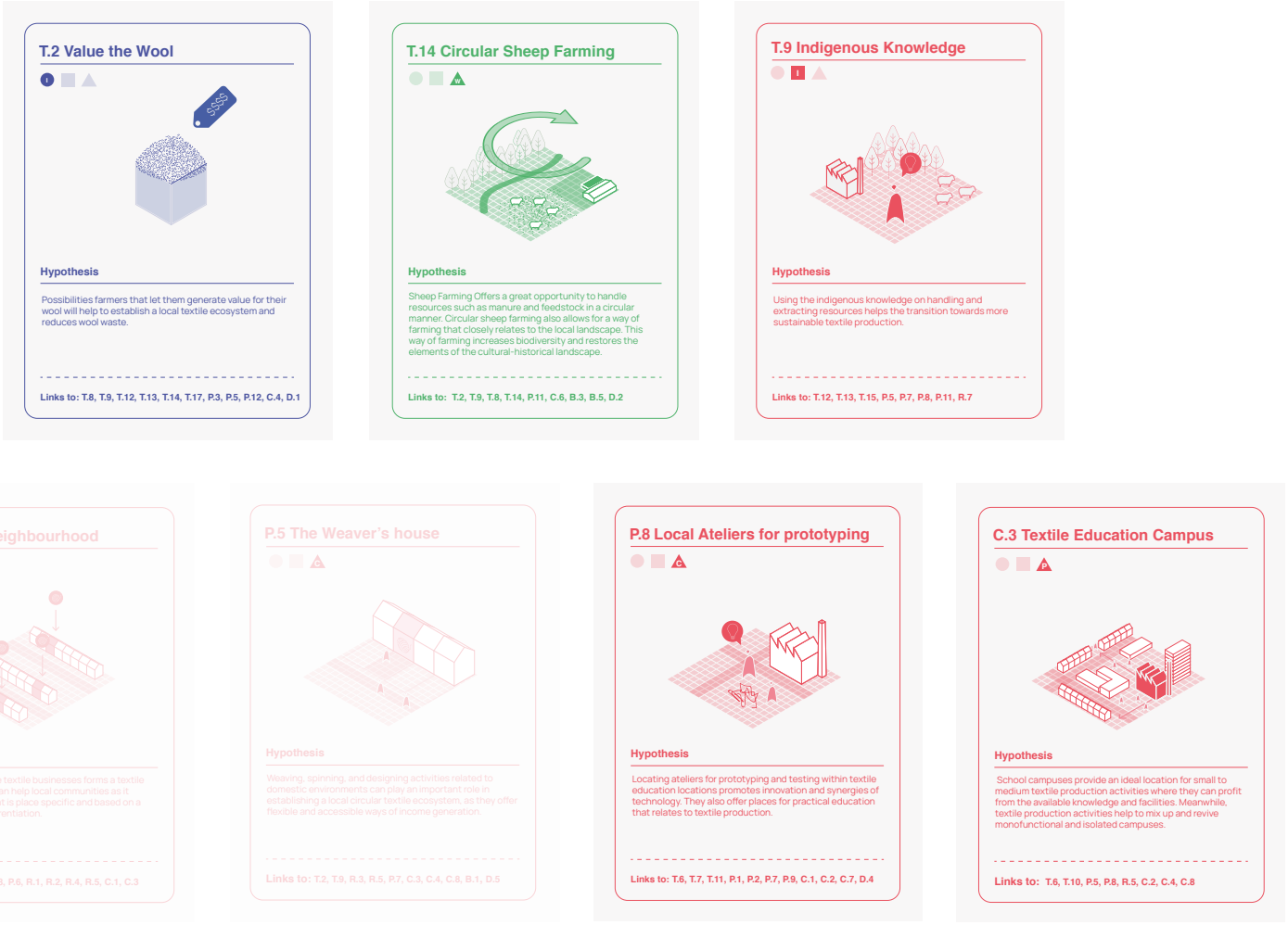
Hypothesis

Using the indigenous knowledge on handling and extracting resources helps the transition towards more sustainable textile production.

Links to: T.12, T.13, T.15, P.5, P.7, P.8, P.11, R.7

Using the pattern languages

Integrated flexibility



Using the pattern languages

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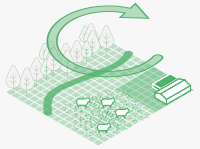

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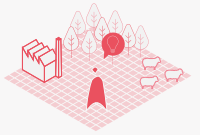

Hypothesis

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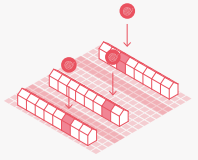
Links to: T.12, T.13, T.15, P.5, P.7, P.8, P.11, R.7

C.4 Textile Neighbourhood

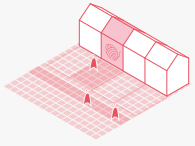


Hypothesis

A gathering of multiple textile businesses forms a textile neighbourhood, this can help local communities as it creates an identity that is place specific and based on a local economy of differentiation.

Links to: T.2, T.6, T.8, P.6, R.1, R.2, R.4, R.5, C.1, C.3

P.5 The Weaver's house



Hypothesis

Weaving, spinning, and designing activities related to domestic environments can play an important role in establishing a local circular textile ecosystem, as they offer flexible and accessible ways of income generation.

Links to: T.2, T.9, R.3, R.5, P.7, C.3, C.4, C.8, B.1, D.5

P.8 Local Ateliers for prototyping

Hypothesis

Locating ateliers for prototyping and testing within textile education locations promotes innovation and synergies of technology. They also offer places for practical education that relates to textile production.

Links to: T.6, T.7, T.11, P.1, P.2, P.7, P.9, C.1, C.2, C.7, D.4

C.3 Textile Education Campus

Hypothesis

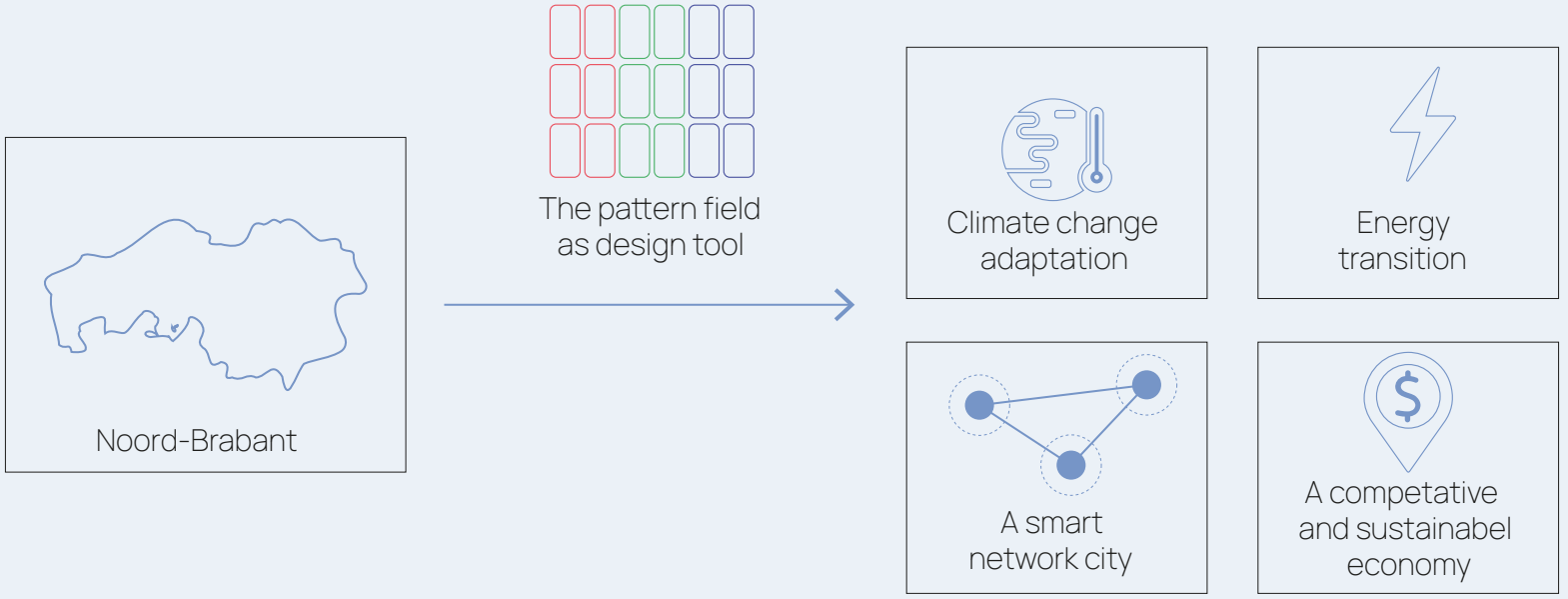
School campuses provide an ideal location for small to medium textile production activities where they can profit from the available knowledge and facilities. Meanwhile, textile production activities help to mix up and revive monofunctional and isolated campuses.

Links to: T.6, T.10, P.5, P.8, R.5, C.2, C.4, C.8

4. **Value** the network of solutions and find a hierarchy in the solutions which helps the context achieve its sustainability goals.

Finding the hierarchy

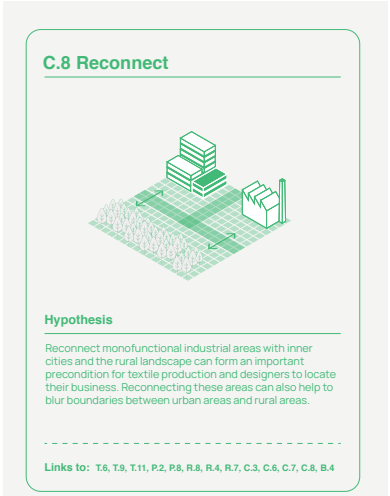
Designing with the pattern field



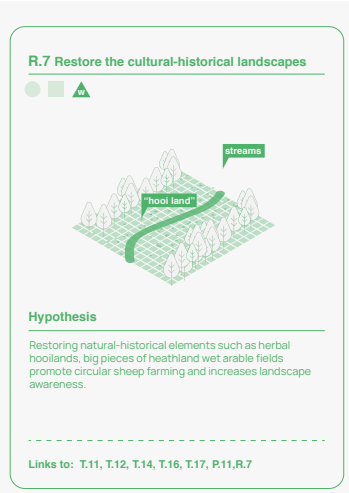
Challenges of Noord-Brabant and the pattern field

Noord-Brabant's textile ecosystem is based on the local landscape

A.



B.



Heat stress

Water nuisance

Waalwijk

Making the heathland and "vennen landschap" more robust

Increased recreational pressure

Increased land competition

Loonse en Drunense Duinen (heatland)
High sand grounds

Increase accessibility and connection to natural areas and create a regional network

Drought

Decline biodiversity

Fragmented natural landscape

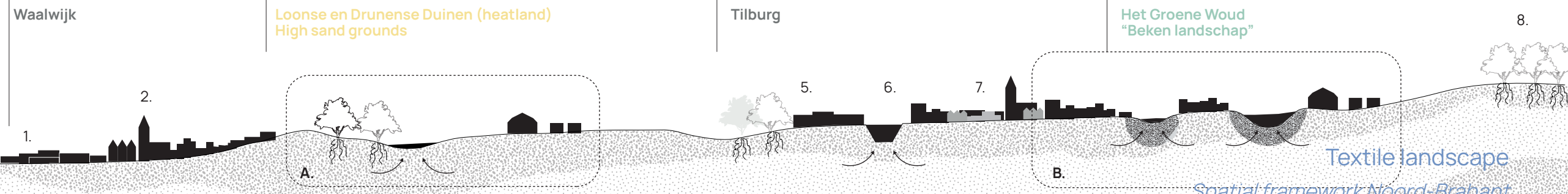
Tilburg

Restore "het beek landschap" increase water retentions and let it function as regional water buffer zone

Drought

Decline biodiversity

Het Groene Woud
"Beken landschap"



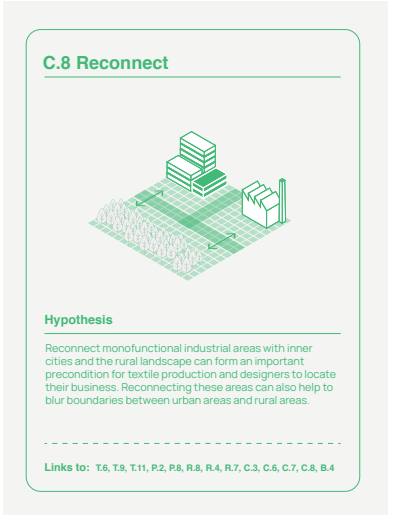
Textile landscape

Spatial framework Noord-Brabant

Identify the strategic elements of the landscape

Understanding the relations between the patterns

A.



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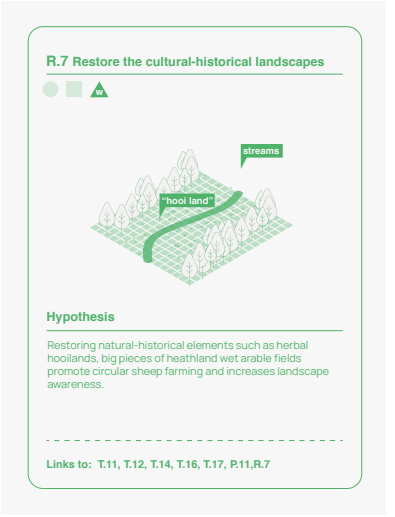
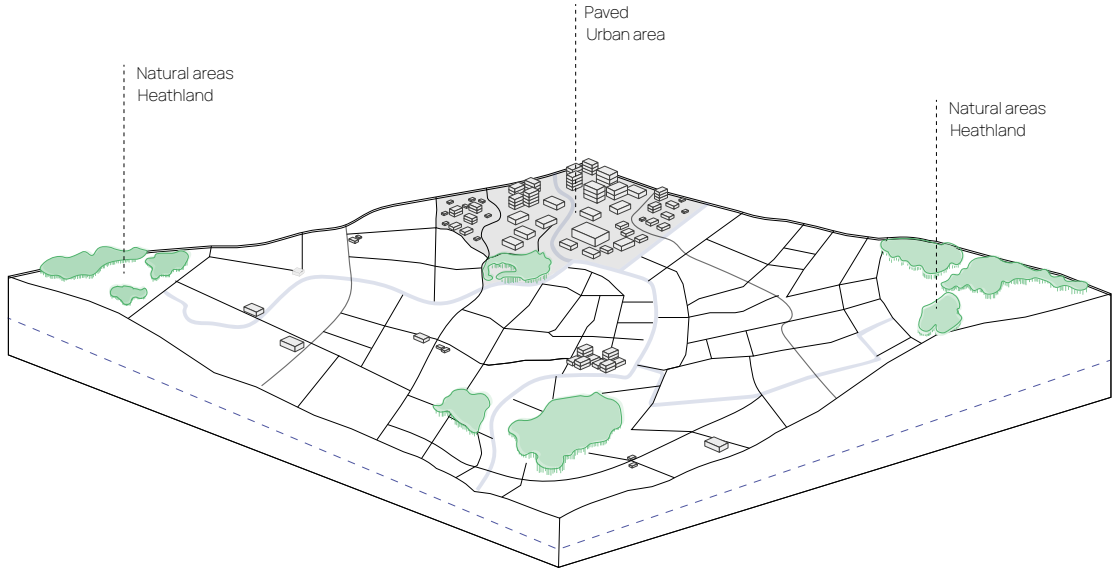


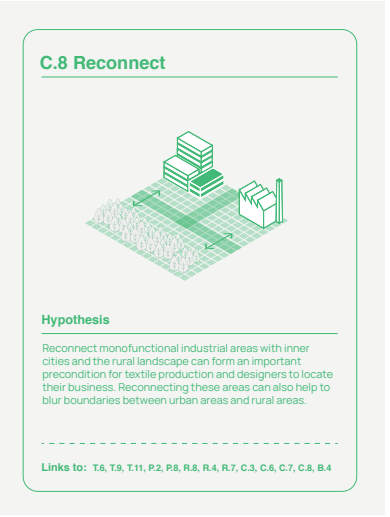


Identify the areas to reconnect.

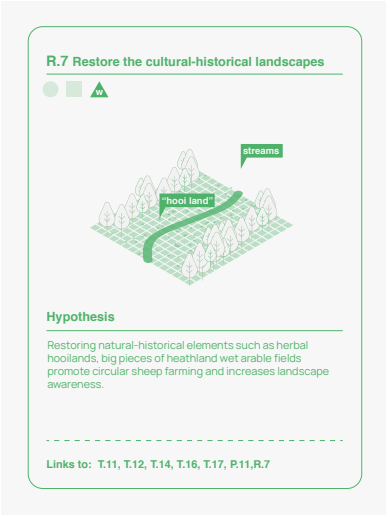
Identify the strategic elements of the landscape

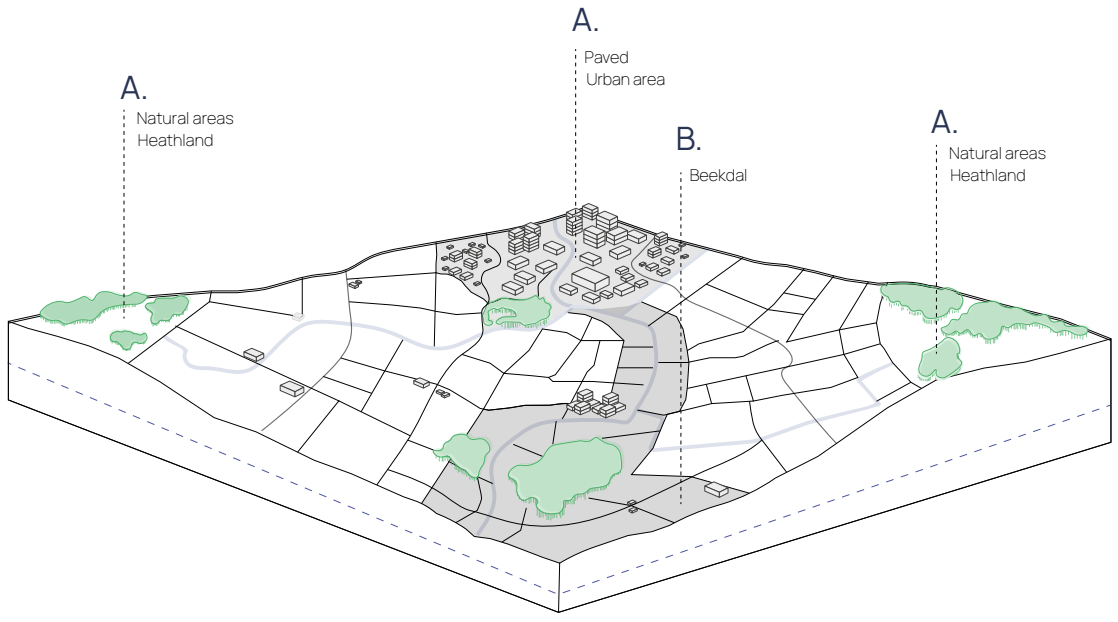
Understanding the relations between the patterns

A.



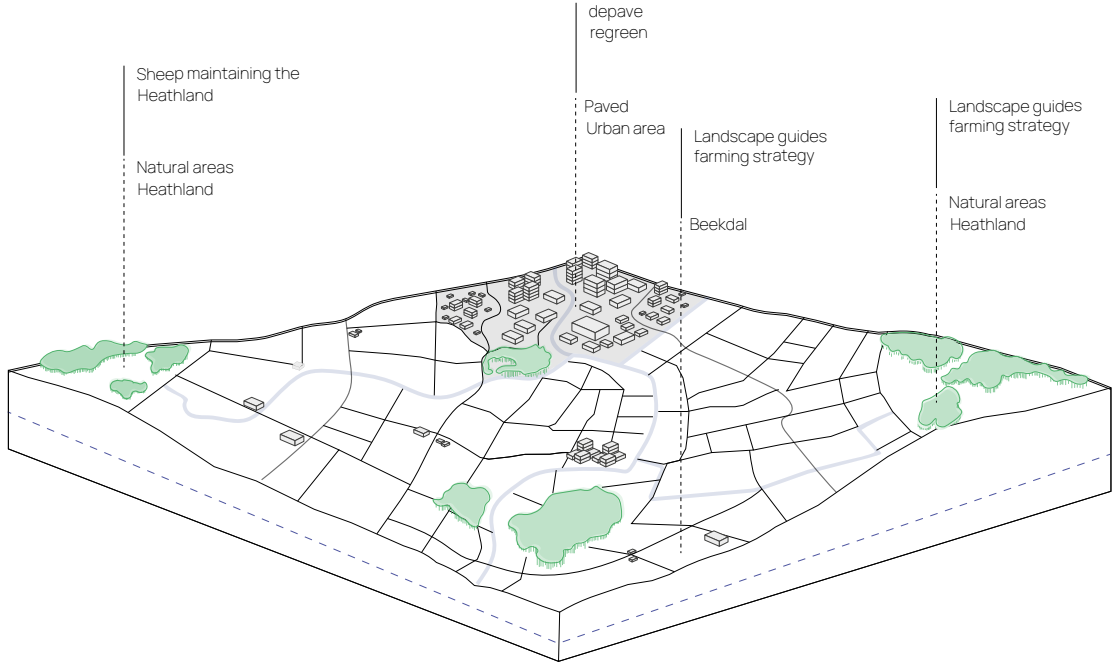
B.

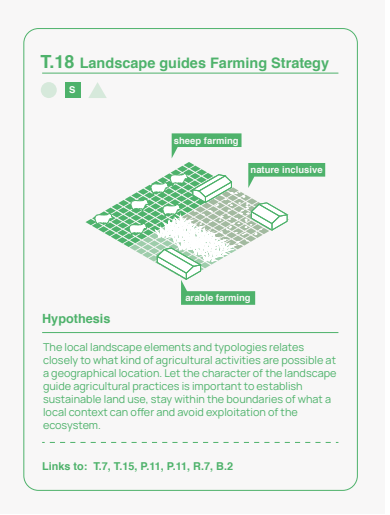


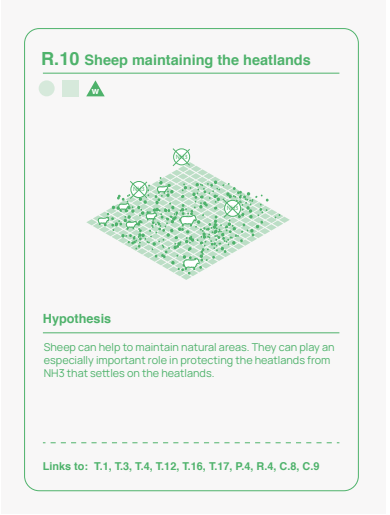


Identify the areas to reconnect: The cultural historical landscape (beken landschap) forms a connector between the urban areas and the natural areas.

Identify possibilities these strategic elements offer

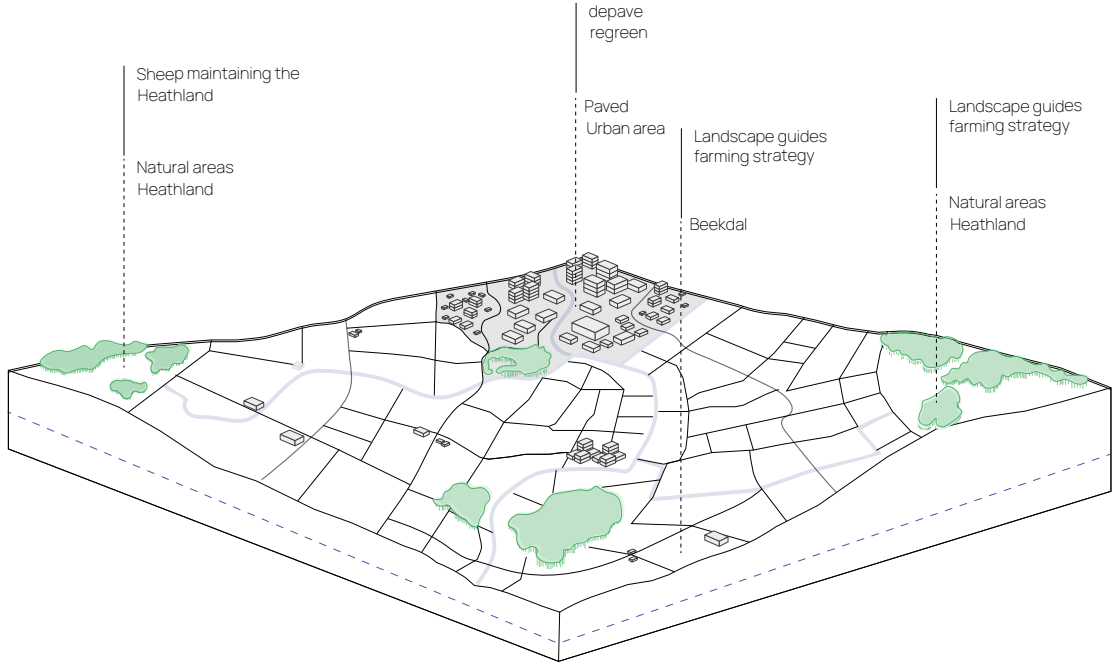






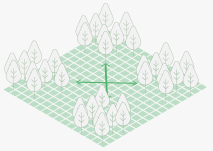
To restore the cultural historical landscape sheep farming has to connect to the local landscape

Patterns help identify interventions needed to fulfil these possibilities



R.11 Expand and connect natural areas

D



Hypothesis

To create a resilient natural ecosystem it is important to restore fragmented natural areas therefore connecting landscapes as heathlands, forests, "vennen" and "beekdalen" is a must.

Links to: T.6, T.15, T.16, P.3, P.14, B.4

B.3 Accessible heathlands and forest

S

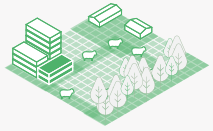
Hypothesis

Local collection hubs must have the opportunity to adapt and react to the growing wool supply. Therefore, it is important that local collections hubs have enough room to expand.

Links to: T.12, T.14, P.12, P.13, R.6, R.8, C.6

R.6 Sheep Corridors

S



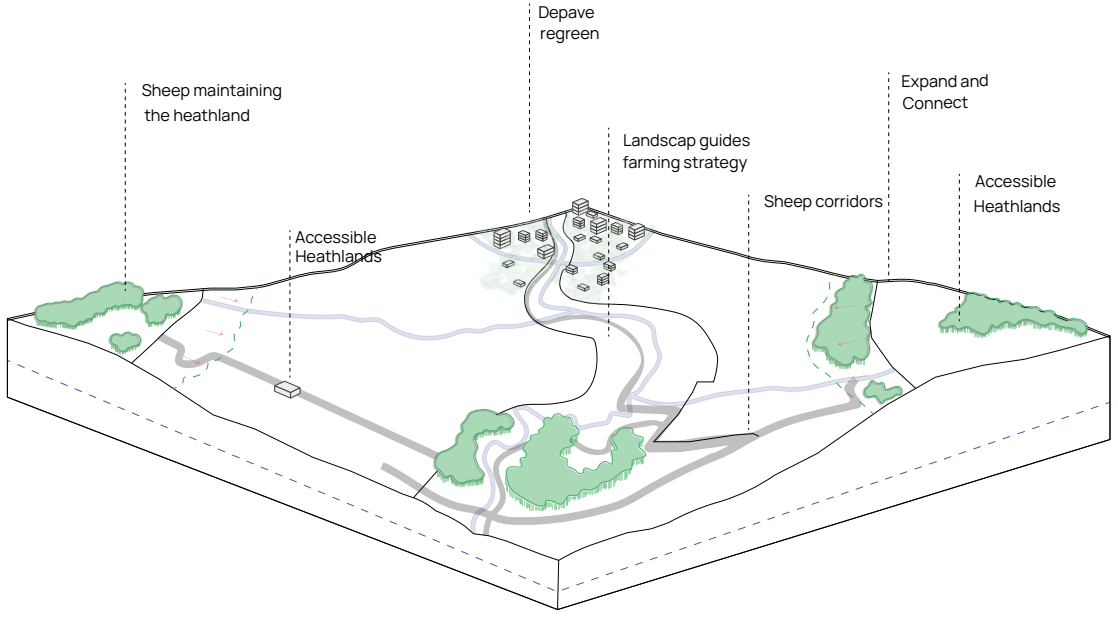
Hypothesis

The introduction of natural corridors that connect pieces of fragmented heathland, grassland, hooiland and forest increase the accessibility and resilience of natural areas, while it also offers the possibility for sheep herds to maintain the natural landscape.

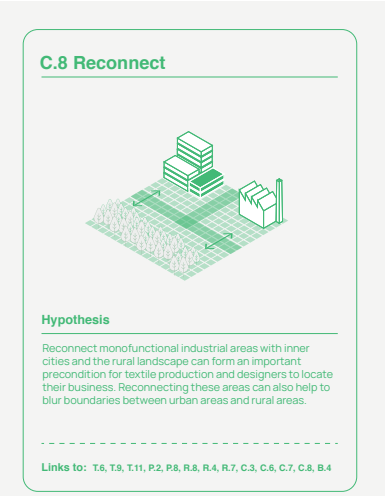
Links to: T.12, T.17, R.7, R.8, C.6, C.8, B.3, B.4

Facilitating patterns

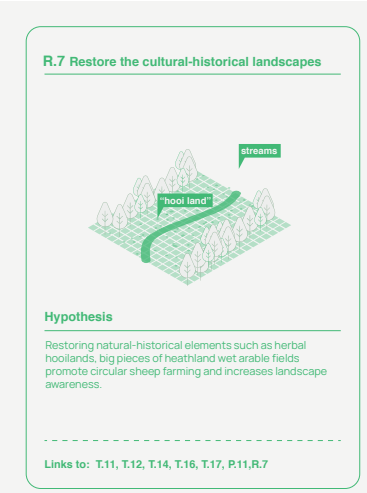
Elements of the solution



A.



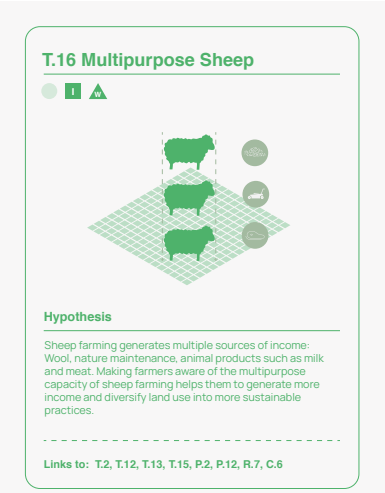
B.



These interventions lead to new opportunities

Introduction of a new theme

A.



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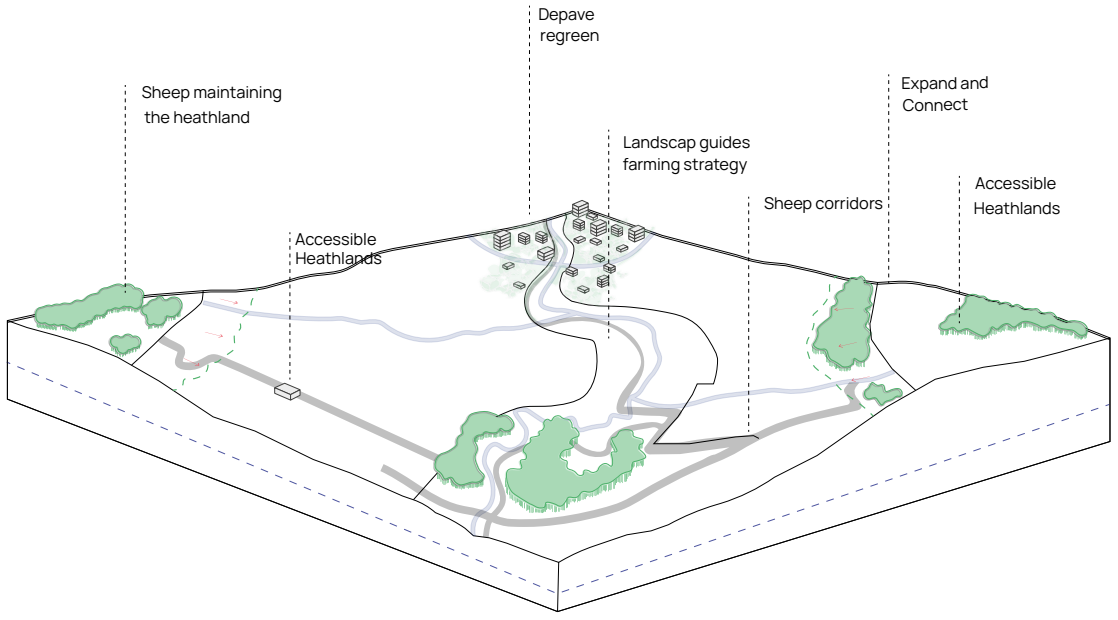
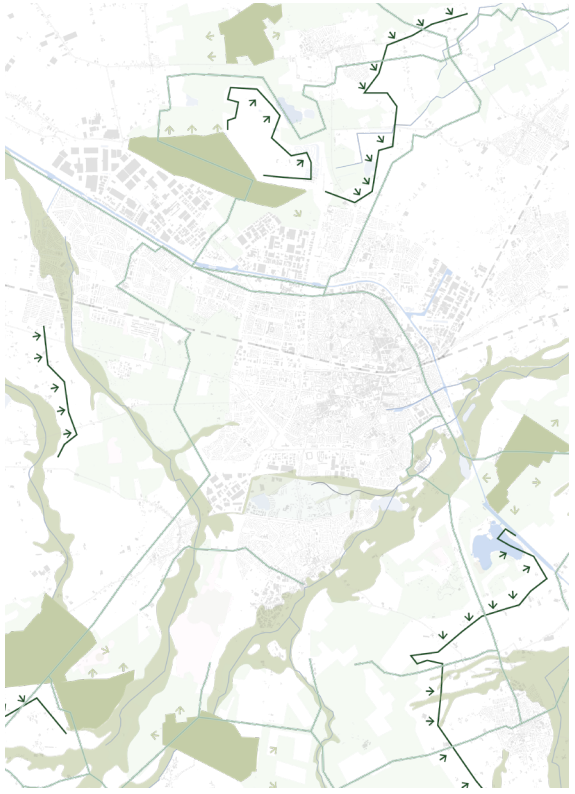


How to alter the context

Local landscape

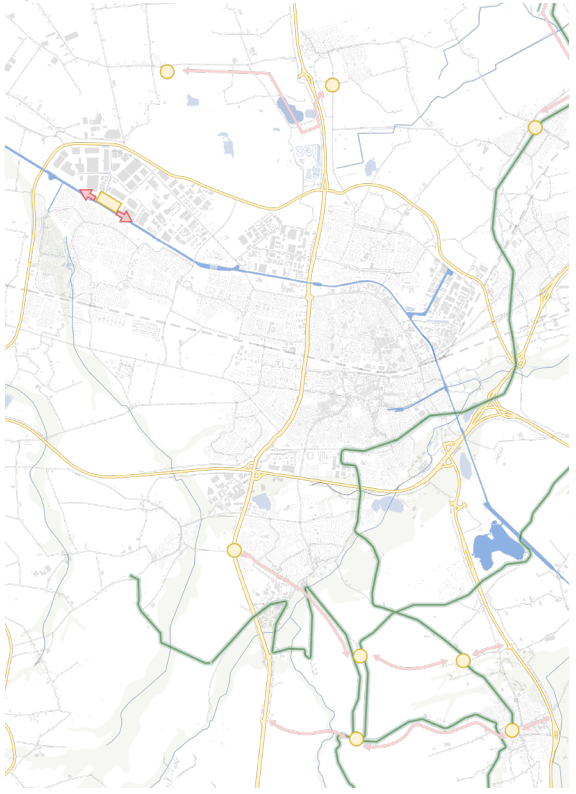


Expand the natural areas

Prepare the "beekdalen" for agricultural activities

Connect heathlands

Agriculture



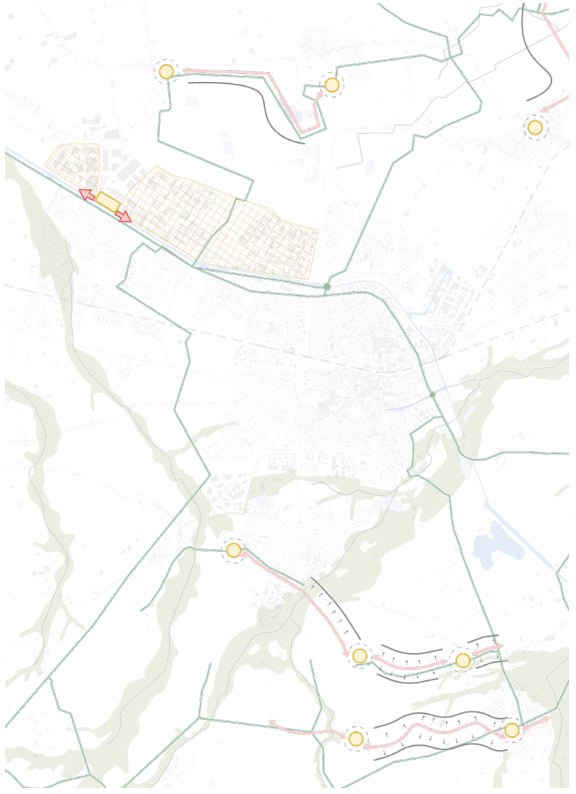
Create shared collection points

Create sheep corridors to make sure the sheep can maintain the heath land

Create a harbour that is focused on transporting wool form the sheep industrial park

Connect the shared collection points

Settlement



New centralities

Possibility for "lint bebouwing"

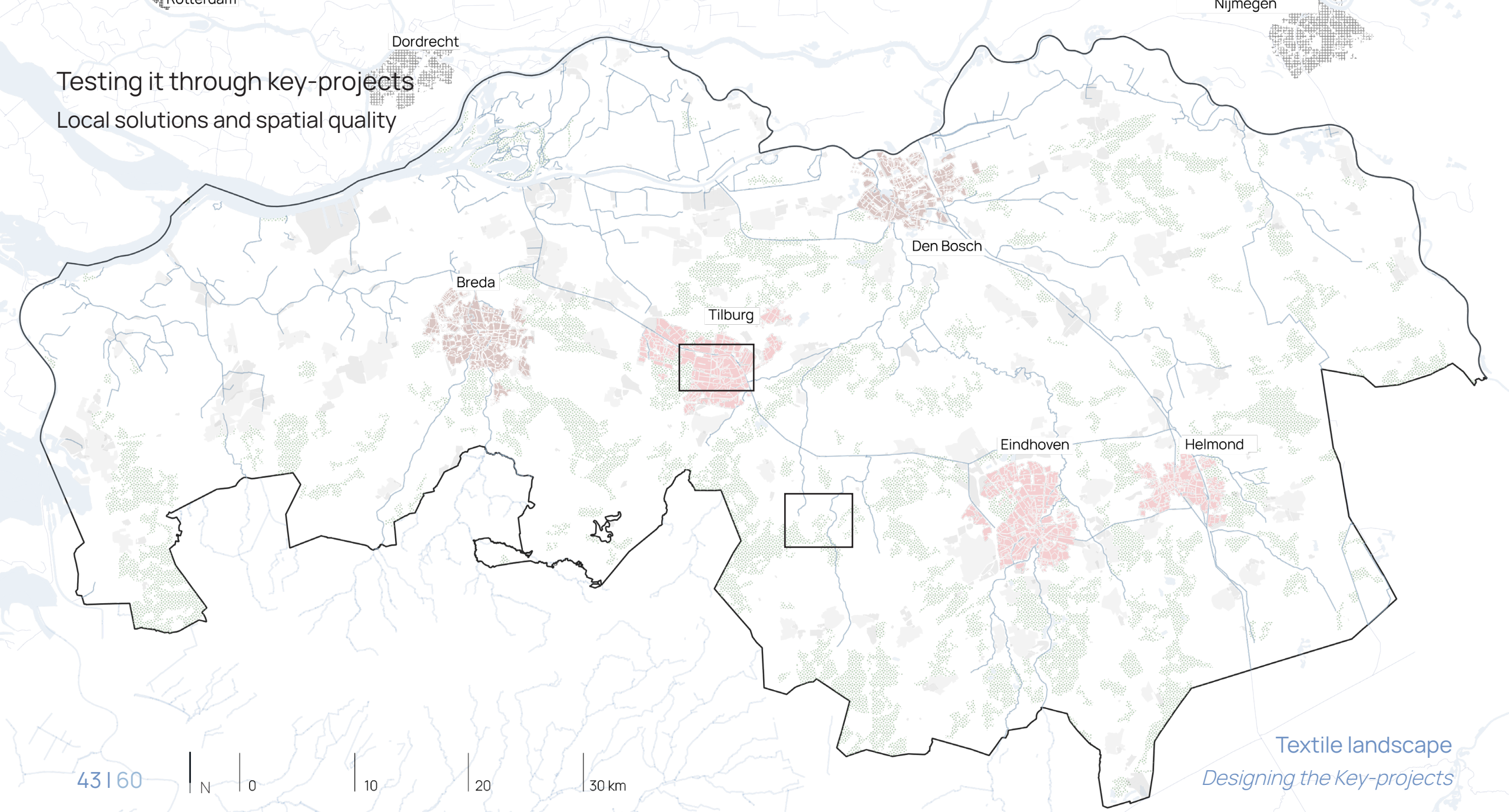
Recreational routes

Accesspoints that connect urban environment to the recreational routes

Textile landscape

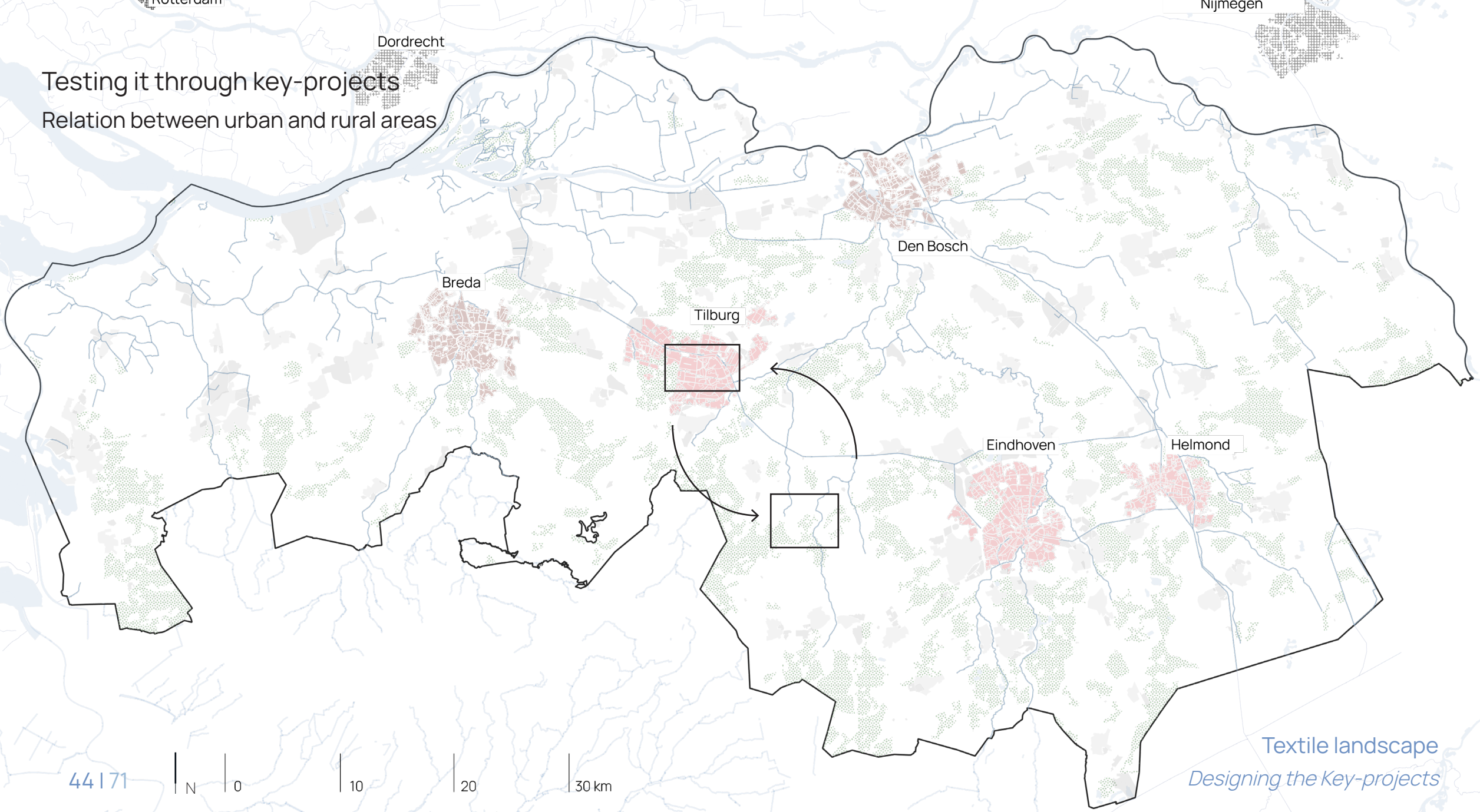
Testing it through key-projects

Local solutions and spatial quality



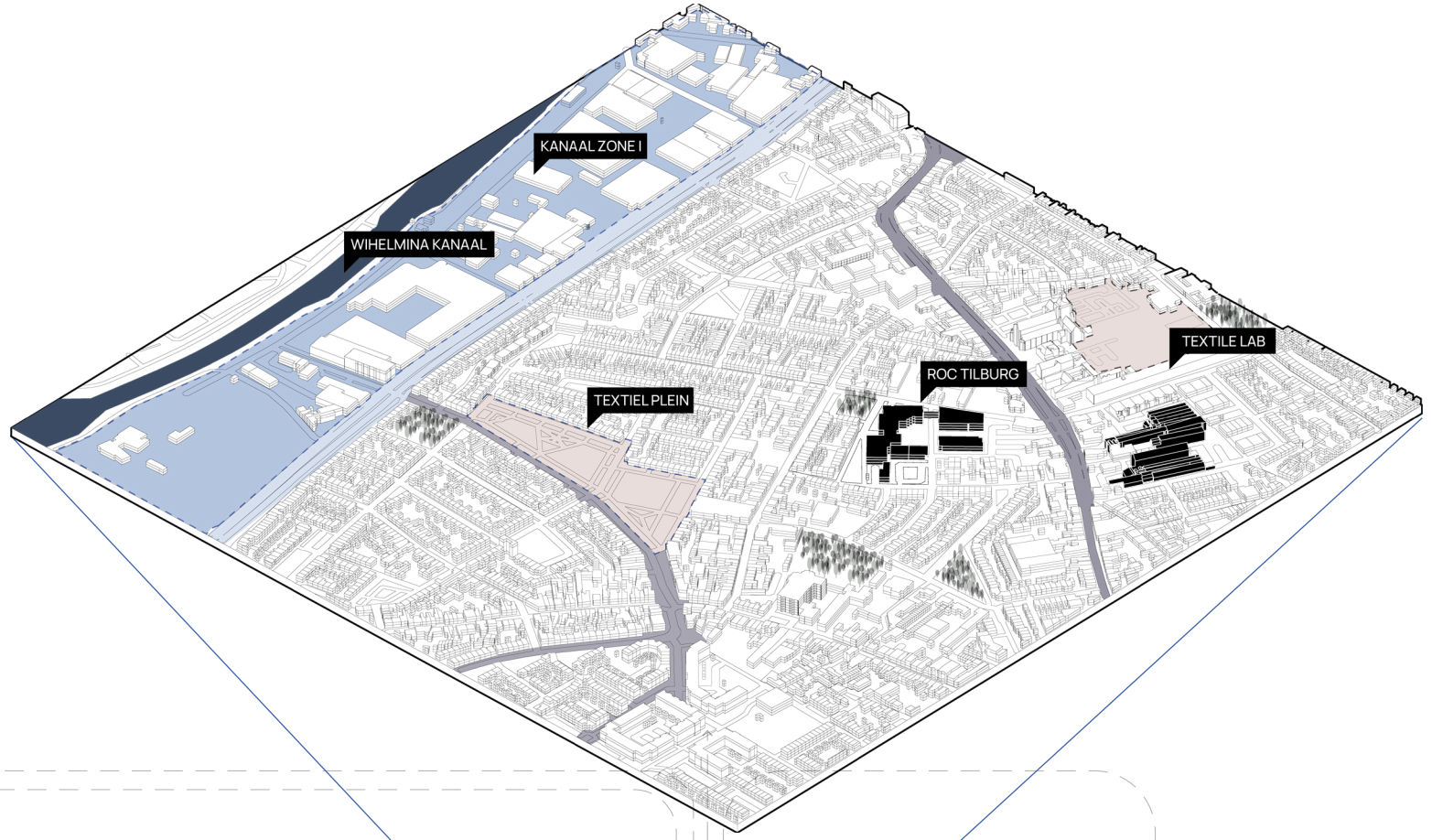
Testing it through key-projects

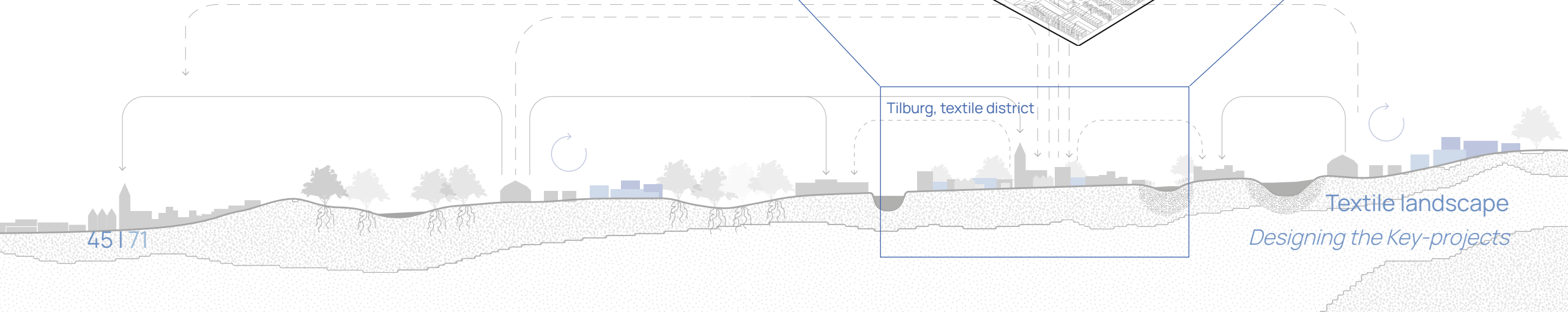
Relation between urban and rural areas



Testing it through key-projects

Context: Urban area



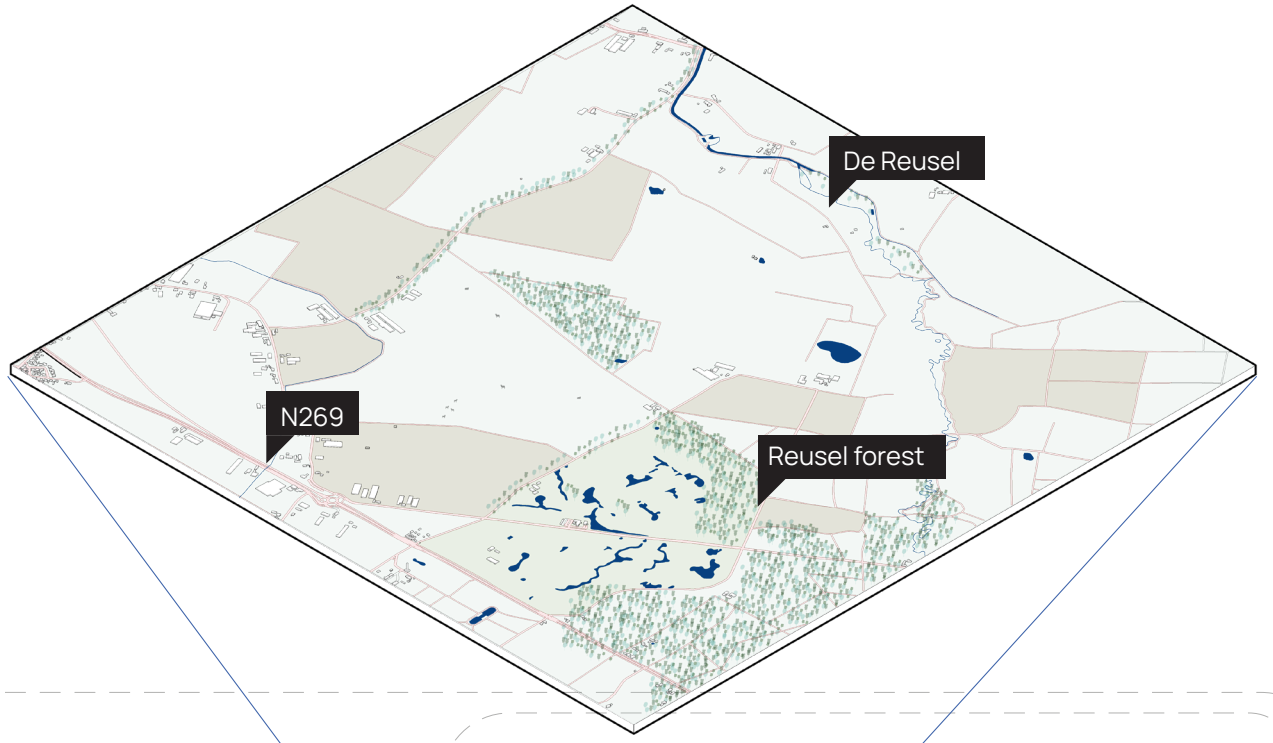


Testing it through key-projects

Context: Urban area

Testing it through key-projects

Context: Rural area



Reusel Mierden, Agricultural cluster

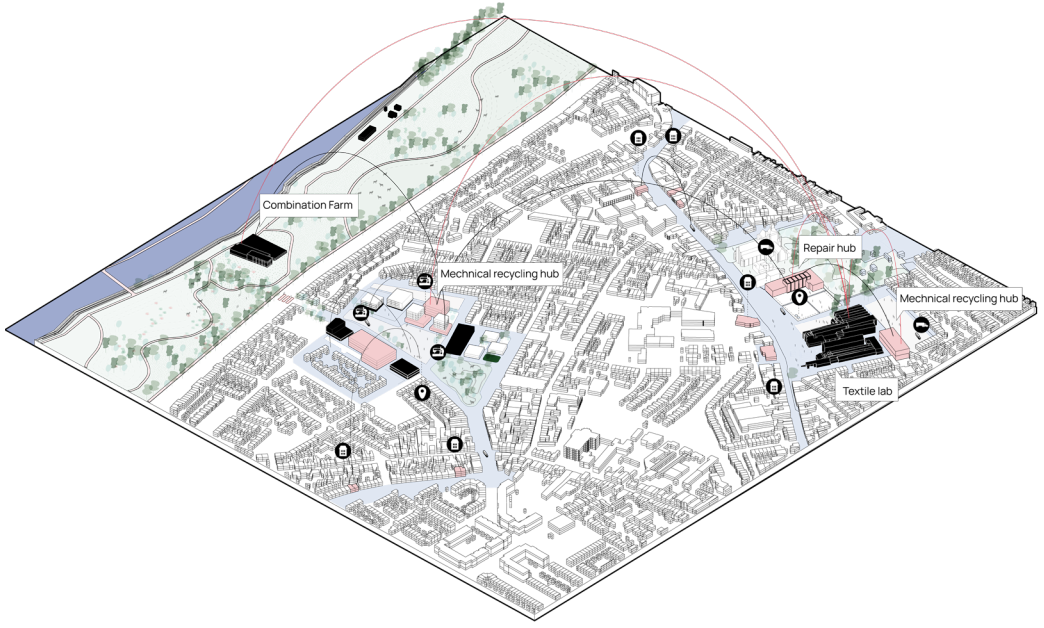
Testing it through key-projects

Context: Rural area

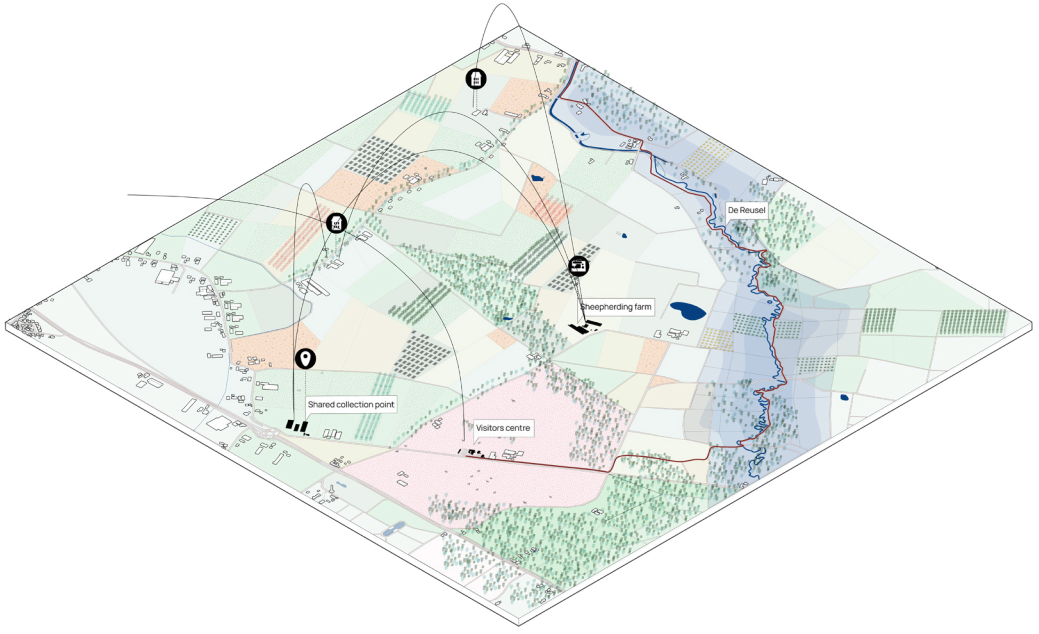
Soft scenario: Cultural value

Relation urban and rural

Urban area

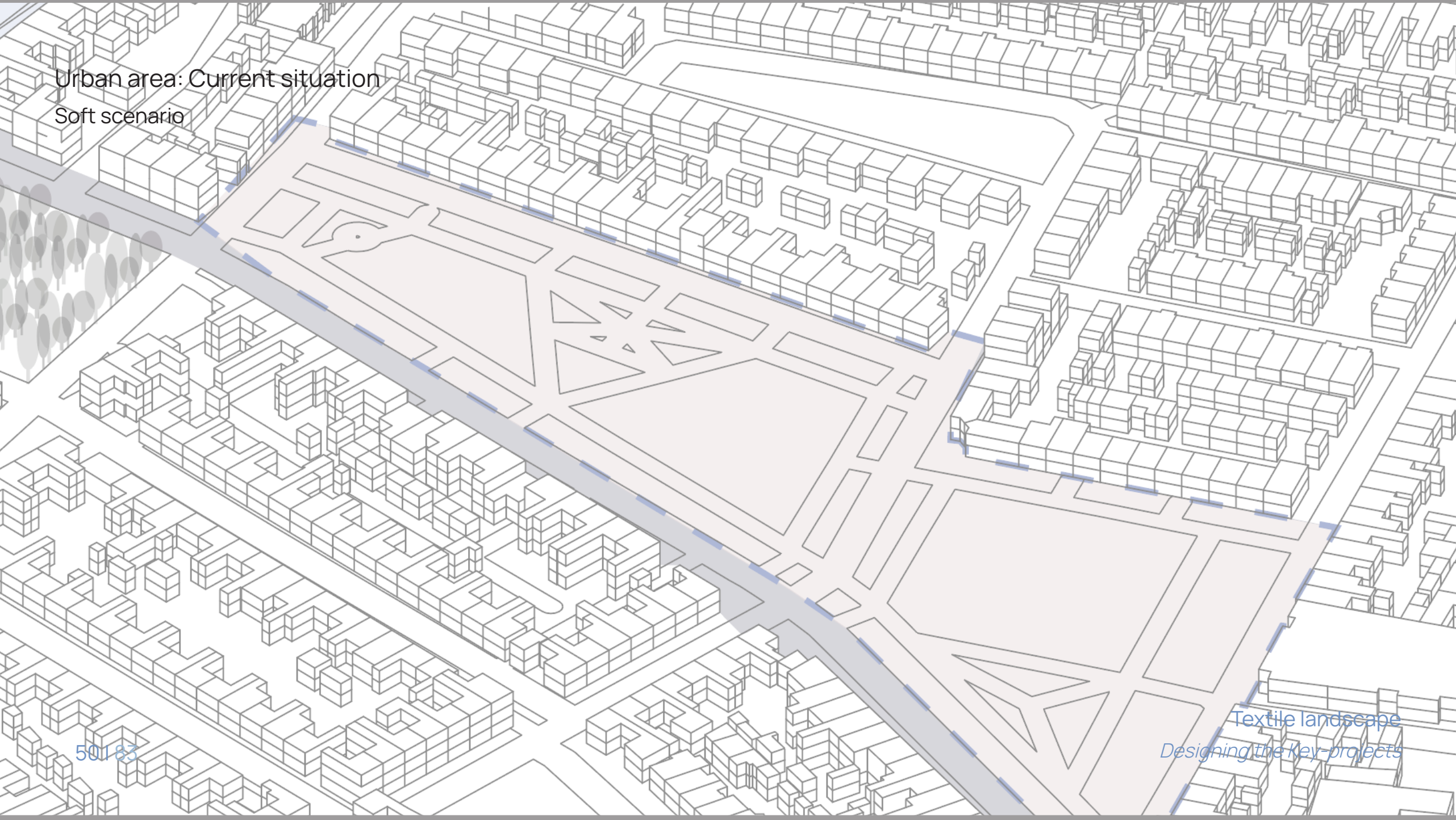


Rural area



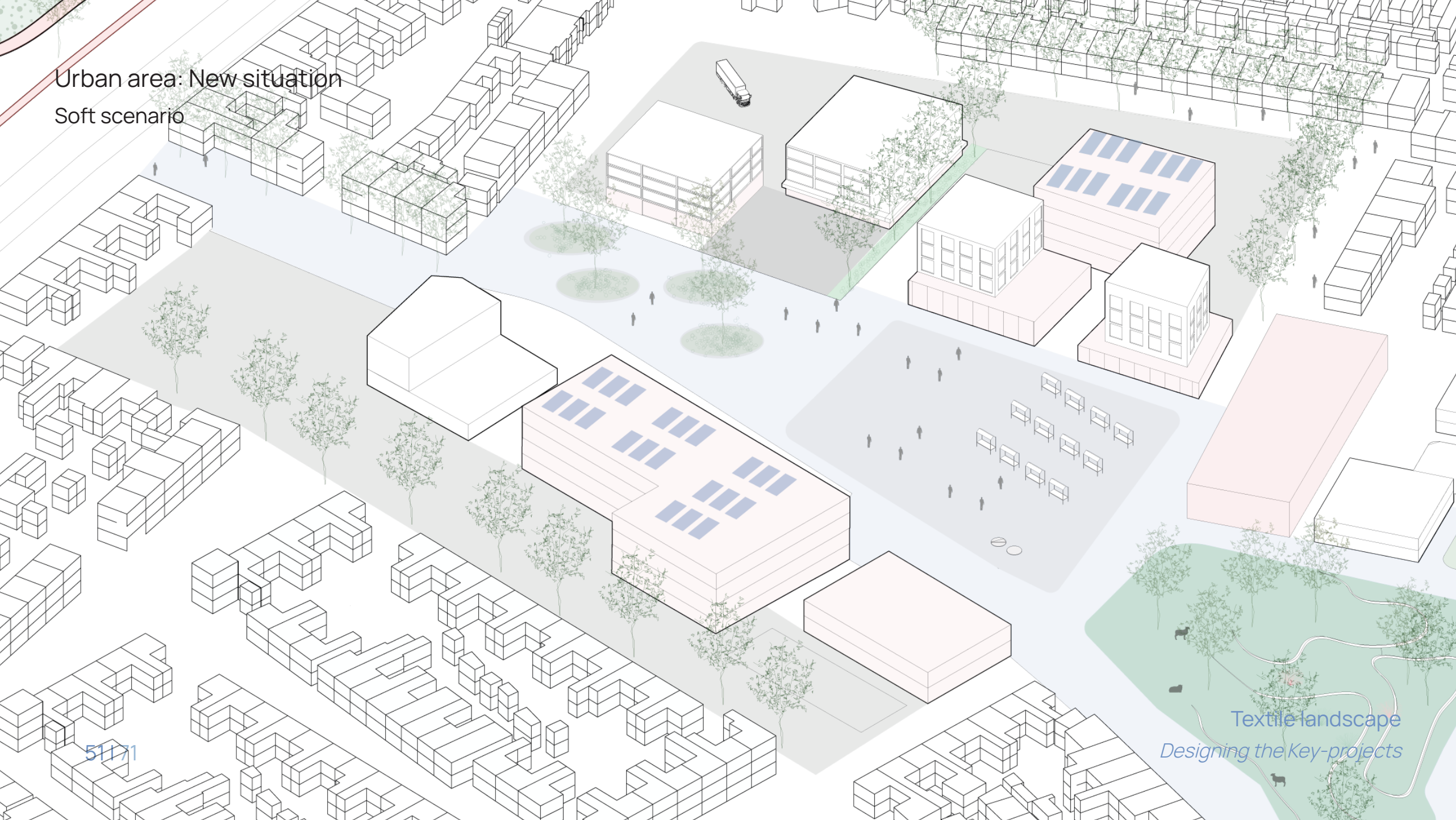
Urban area: Current situation

Soft scenario



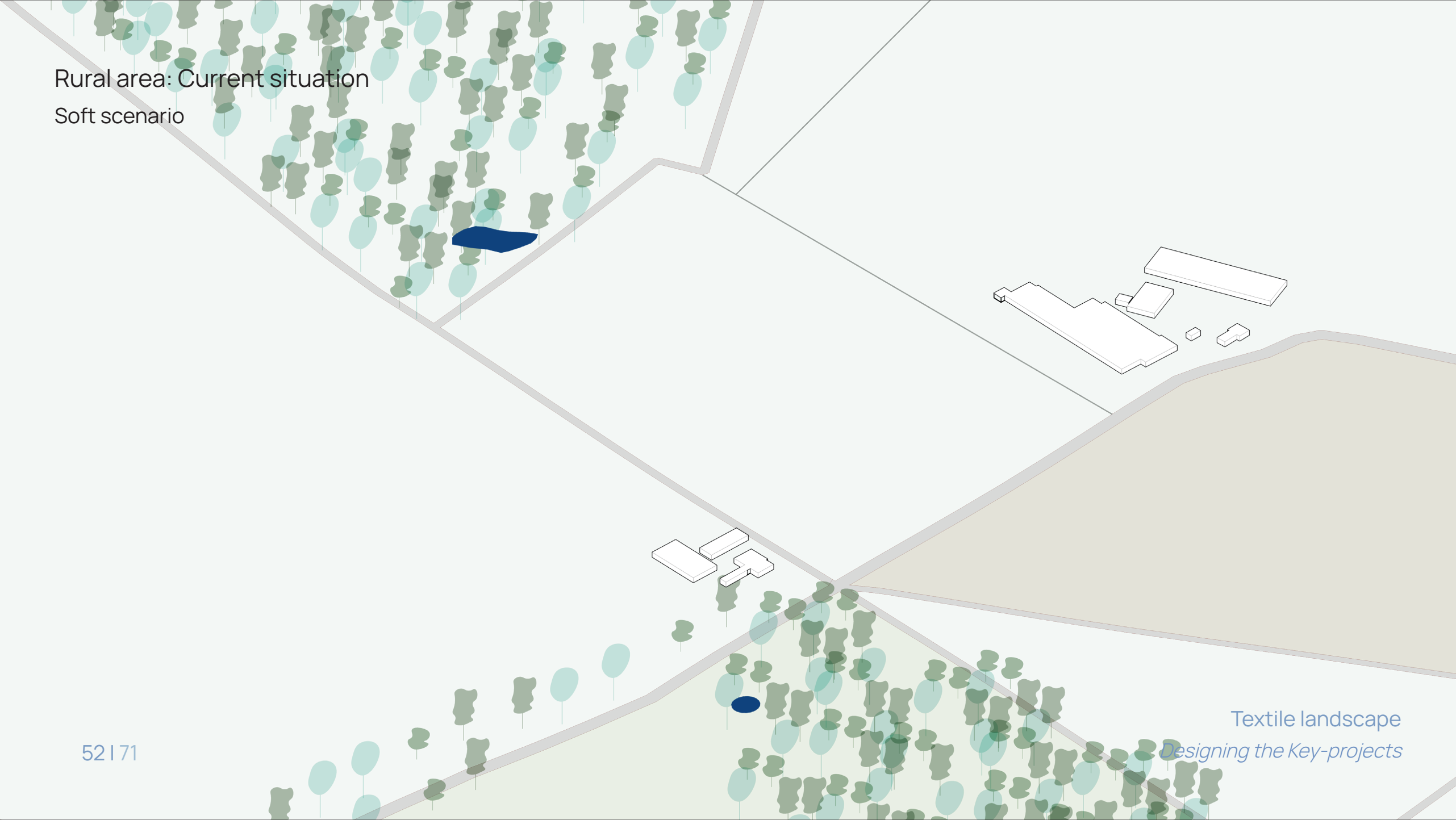
Urban area: New situation

Soft scenario



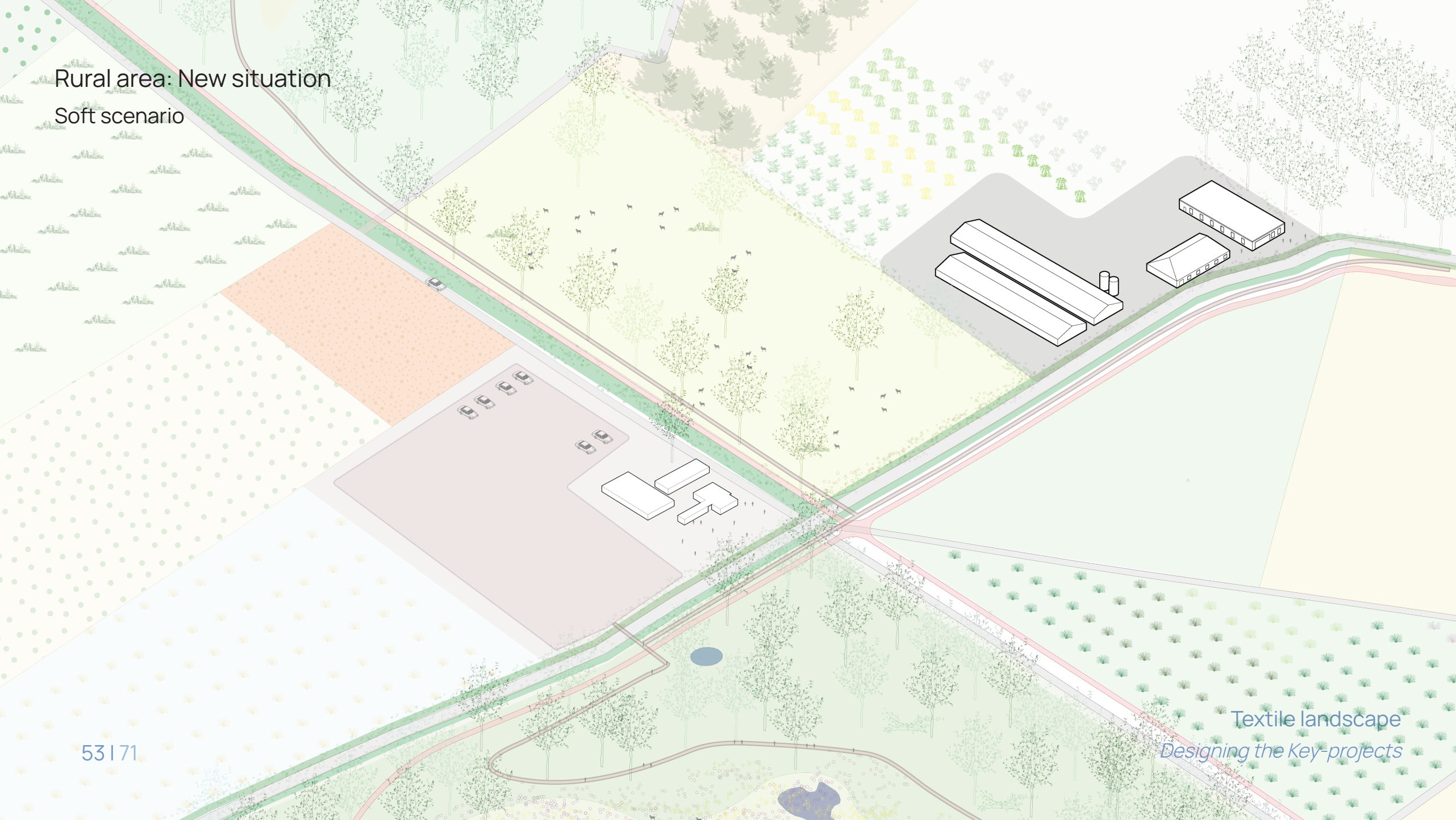
Rural area: Current situation

Soft scenario



Rural area: New situation

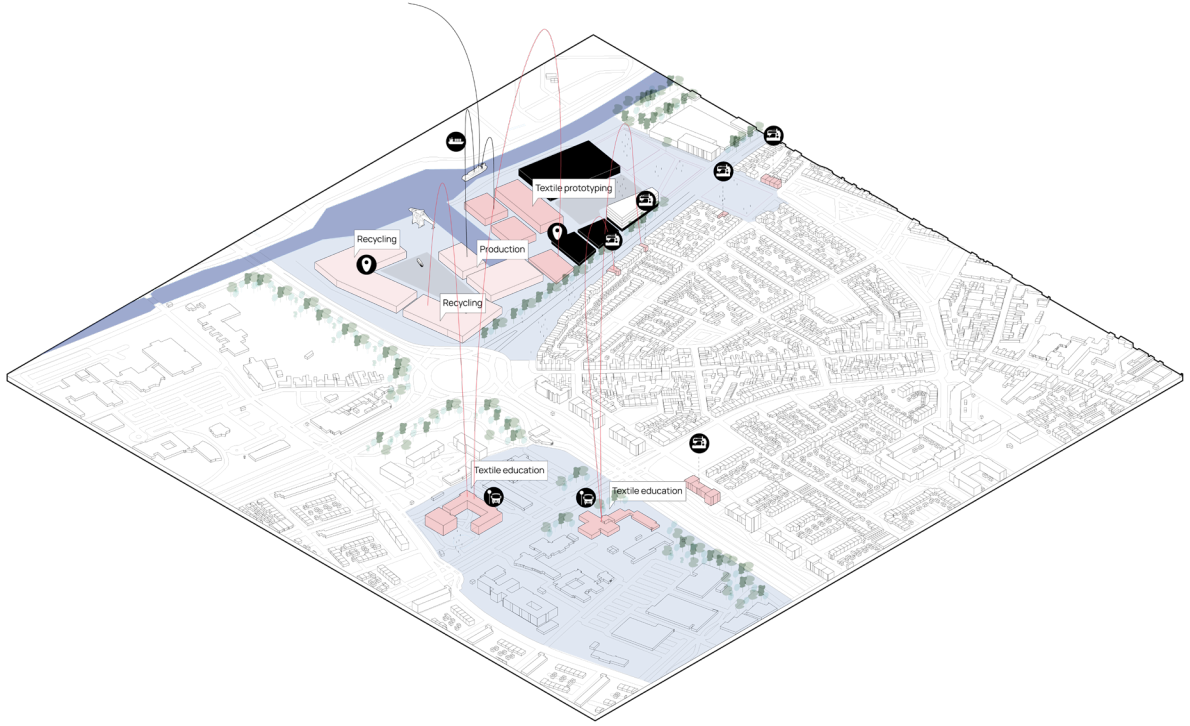
Soft scenario



Extreme scenario: Scaling-up the sheep herds

Relation urban and rural

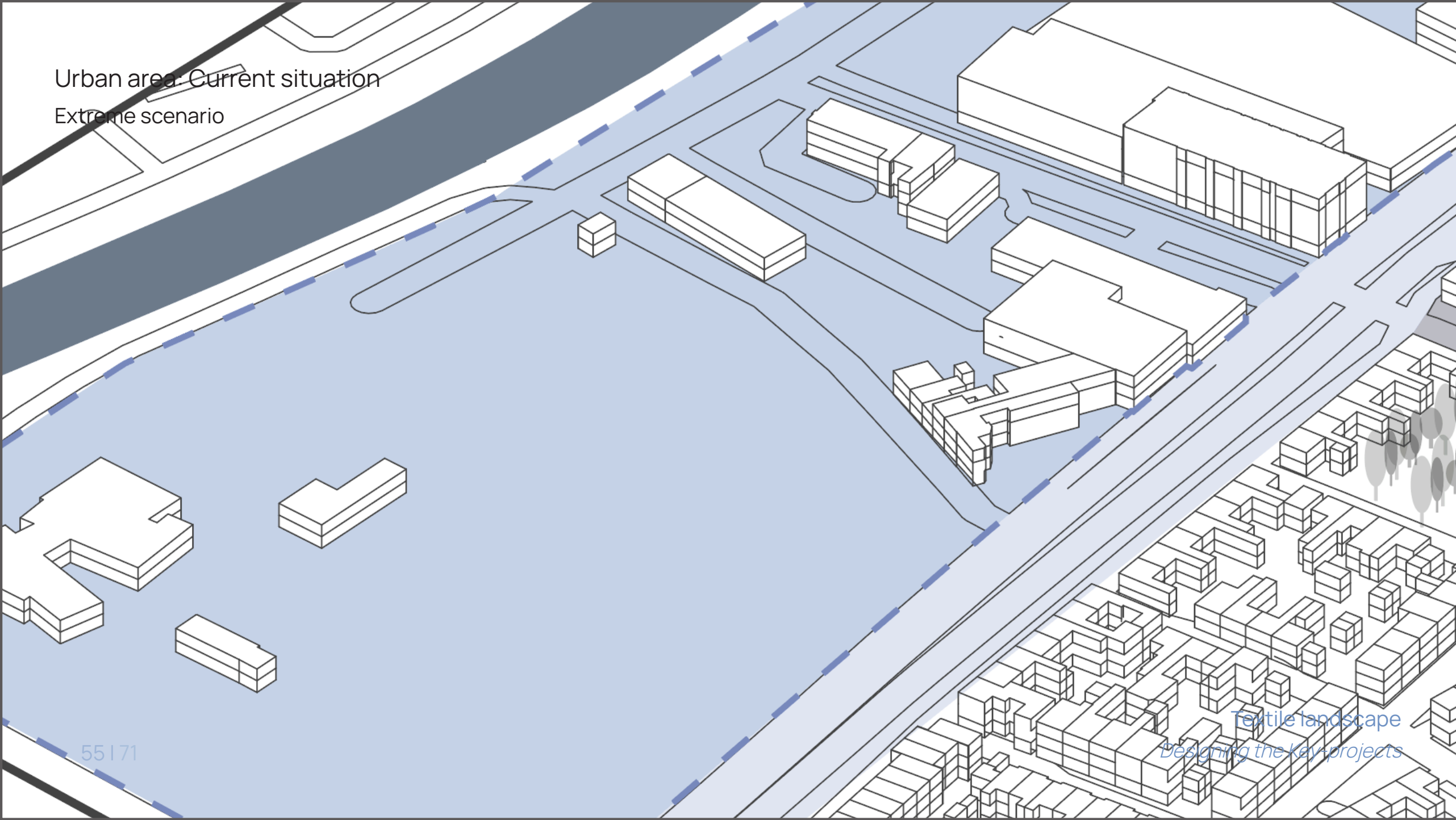
Urban area



Rural area

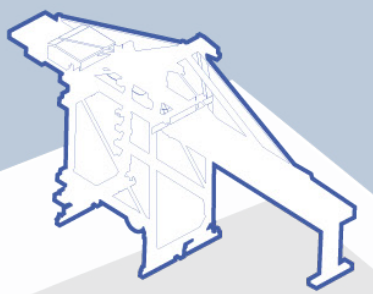
Urban area: Current situation

Extreme scenario



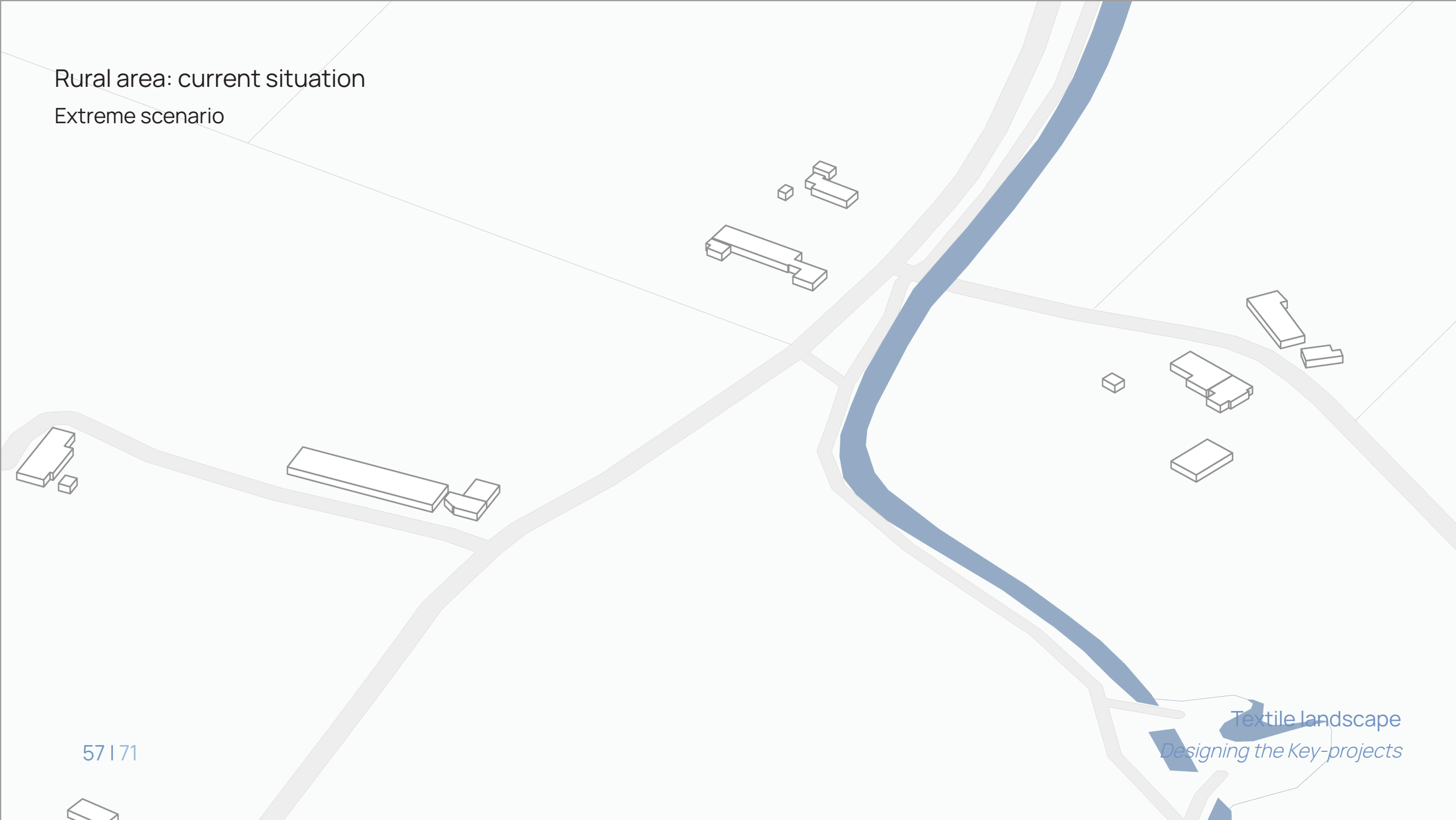
Urban area: New situation

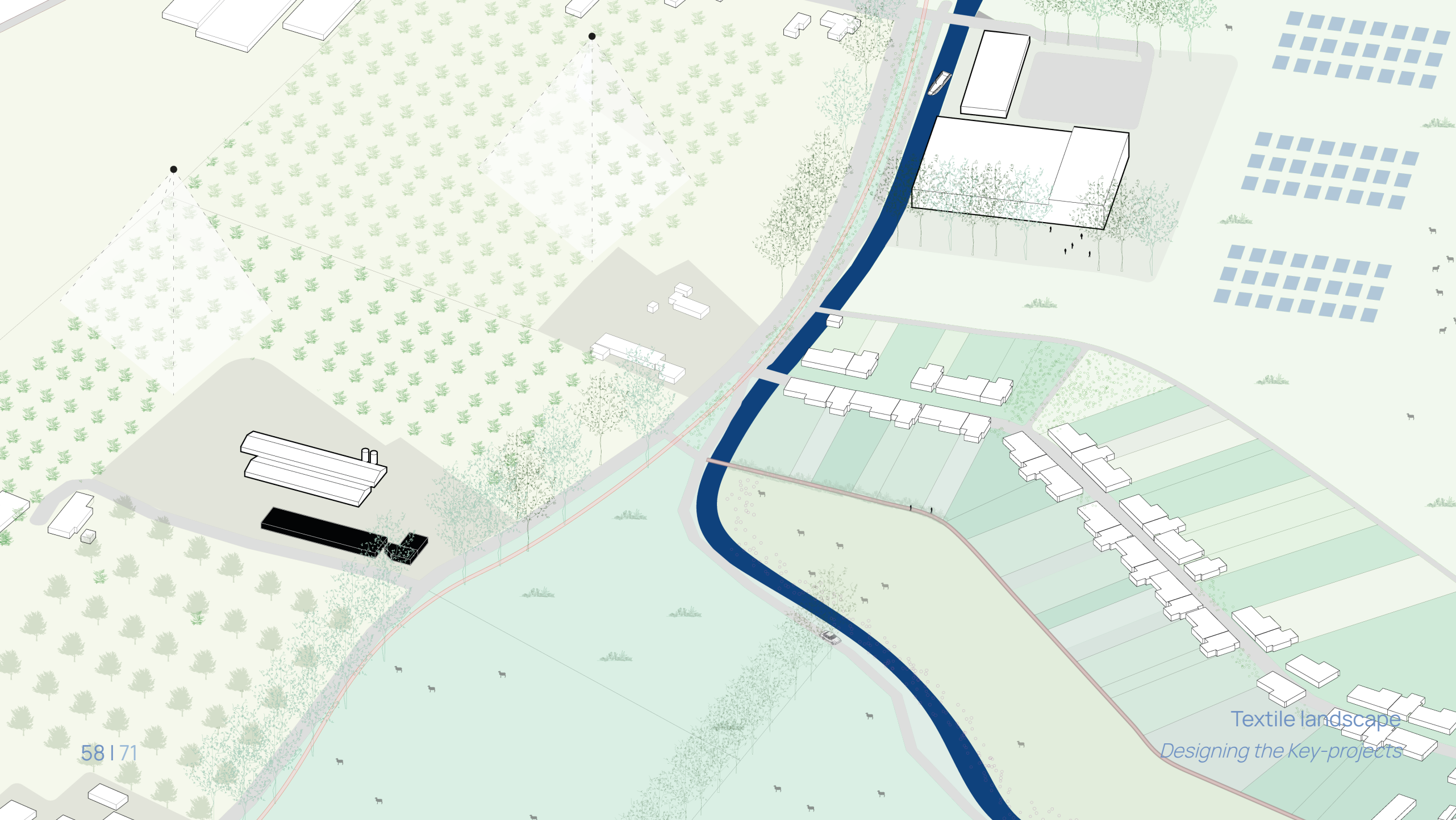
Extreme scenario



Rural area: current situation

Extreme scenario

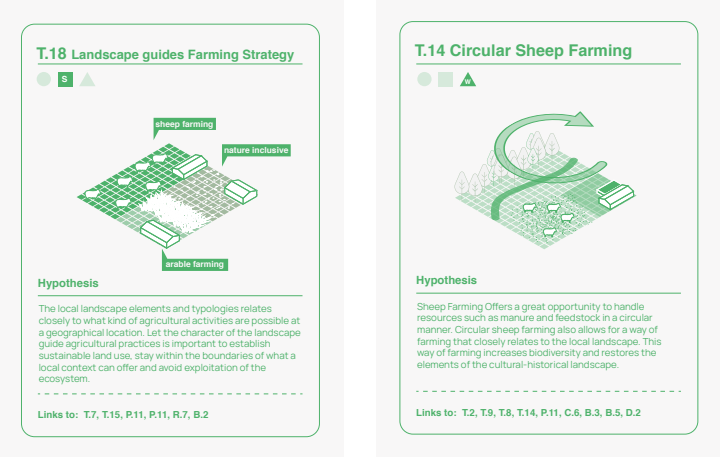




5. **Reflect** on the design practices and formulate recommendations for the future

Policy recommendations

Regional scale

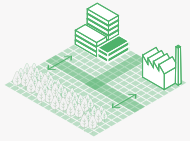


Reconnect and expand the natural areas and the cultural historical landscape, this landscape can function as a framework for future sustainable land-use and guide decisions related to agricultural land-use.

Policy recommendations

Regional scale

C.8 Reconnect

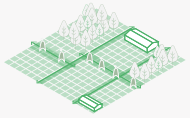


Hypothesis

Reconnect monofunctional industrial areas with inner cities and the rural landscape can form an important precondition for textile production and designers to locate their business. Reconnecting these areas can also help to blur boundaries between urban areas and rural areas.

Links to: T.6, T.9, T.11, P.2, P.8, R.8, R.4, R.7, C.3, C.6, C.7, C.8, B.4

R.8 Recreational Routes

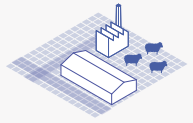


Hypothesis

Local communities benefit from recreational routes as they form places to provide places to enjoy nature, exercise, meet and socialize.

Links to: T.11, P.6, P.7, P.8, P.12, P.13, R.6, C.8, C.9

P.2 Combination Wool Farm

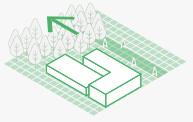


Hypothesis

Combining textile production activities with agricultural land use serves two goals. On one hand it helps farms to increase income and diversify land use on the other hand it helps to create a local circular textile ecosystem.

Links to: T.5, T.6, T.14, P.1, P.6, P.8, P.13, R.1,B.1, C.7, C.8

P.13 Visitor Center



Hypothesis

Combining sheep herding farms with a visitors' centre helps to increase landscape awareness and ensures the accessibility of natural and recreational landscapes.

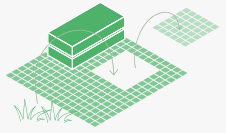
Links to: T.9, P.2, P.7, P.9, R.5, C.8, B.3

Reconnect the urban the rural this can be done introducing new program rural areas and by the reintegration of natural elements in urban areas. Increasing the accessibility of rural areas helps by balancing out the dependance of urban areas.

Policy recommendations

Local scale

B.4 Depave & Regreen

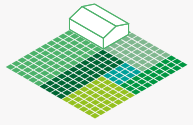


Hypothesis

Depaving and regreening helps increase the infiltration capacity while it also increases natural qualities of the area.

Links to: T.4, T.5, P.12, P.14, R.6, R.9, C.8, D.2

B.6 Diversify land use

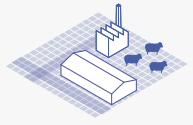


Hypothesis

Deversifying agricultural land use helps with restoring soil and crophealth. Diversifying land use helps farmers move away from monoculture which contributes to landscape experience and the spatial quality.

Links to: T.6, T.15, T.16, P.3, P.14, B.4

P.2 Combination Wool Farm

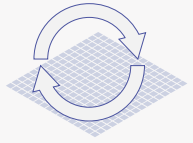


Hypothesis

Combining textile production activities with agricultural land use serves two goals. On one hand it helps farms to increase income and diversify land use on the other hand it helps to create a local circular textile ecosystem.

Links to: T.5, T.6, T.14, P.1, P.6, P.8, P.13, R.1,B.1, C.7, C.8

T.6 Re use of material and Energy



Hypothesis

Local production of waste water, materials and heat could be turned into innovative new uses, to reduce the dependency on primary raw materials and reduce environmental pressures.

Links to: T.5, P.1, P.2, P.11, P.14 C.1, C.2, C.4, C.8, R.9, P.4

Re-intergration of natural elements in the dense urban areas.

For both urban as rural areas mix up mono-functional land-use. This can be done by the introduction of production activities, closing material loops locally.

Conclusion

Main research question

How should the urban landscape of Noord-Brabant be configured to overcome the metabolic imbalance with spatial circularity in the textile industry, while achieving its own sustainability?

Conclusion

Main research question

The pattern language and spatial framework of Noord- Brabant are design tools to approach the circularity transition in a holistic way.

Conclusion

Main research question

The pattern language as a design tool helps to translate abstract goals into concrete spatial and context-specific solutions.

Conclusion

Main research question

The spatial framework for Noord-Brabant allows a certain degree of flexibility. This leaves room for interpretation without compromising the desired outcome.

Conclusion

Main research question

A holistic design method for spatial circularity requires a shift in focus when it comes to measuring circularity targets. The (spatial)quality that the transition can offer should be considered, rather than only focusing on quantitative targets.

Conclusion

Main research question

The pattern language and spatial framework provide tools to overcome metabolic imbalances such as the separation between consumption/production and city/ hinterland.
This is mainly because the pattern language tool makes it possible to design spatial cause and effect. This makes it possible to formulate spatial preconditions for a local ecosystem.

Alternative futures and the role of the urban designer

Pattern language as design tool

What constructs our living environment?

Thank you all for listening!