Sustainable renewal in Colonies of Benevolence

Cultural heritage as a vector for sustainable agricultural development in the Netherlands

Keyan Tang

Mentors:
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Introduction-Story

Figure1: A Colonist's Family, De Rijk family as they came with all their possessions, 1909 (Maatschappij van Weldelijkheid).

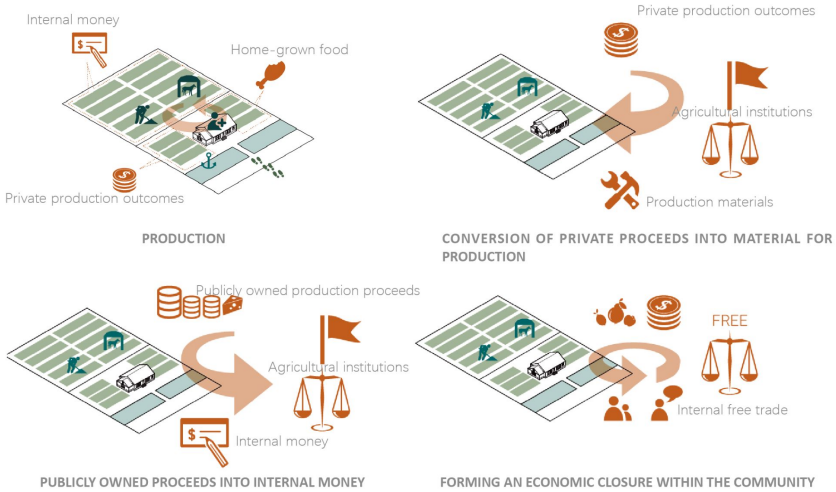
Introduction-Story

Figure2: De Rijk family with their new house and cow, 1911(Maatschappij van Weldelijkheid).

Introduction-Establishment

Figure 3: Map provided by the author

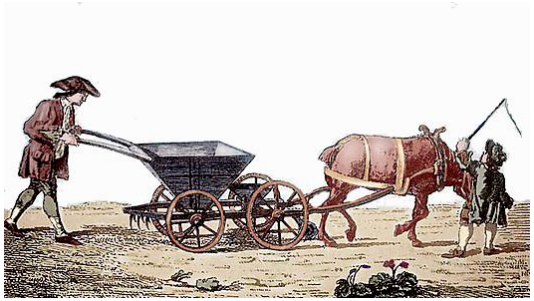
Migration



Establishment of colonial society

Figure 4: Drawings provided by the author

Introduction-theory



PHYSIOCRACY

Figure 5: Drawing provided by the author

THE ENLIGHTENMENT

Figure 6: Drawing provided by the author

Figure 7: Collage provided by the author

Introduction-achievements

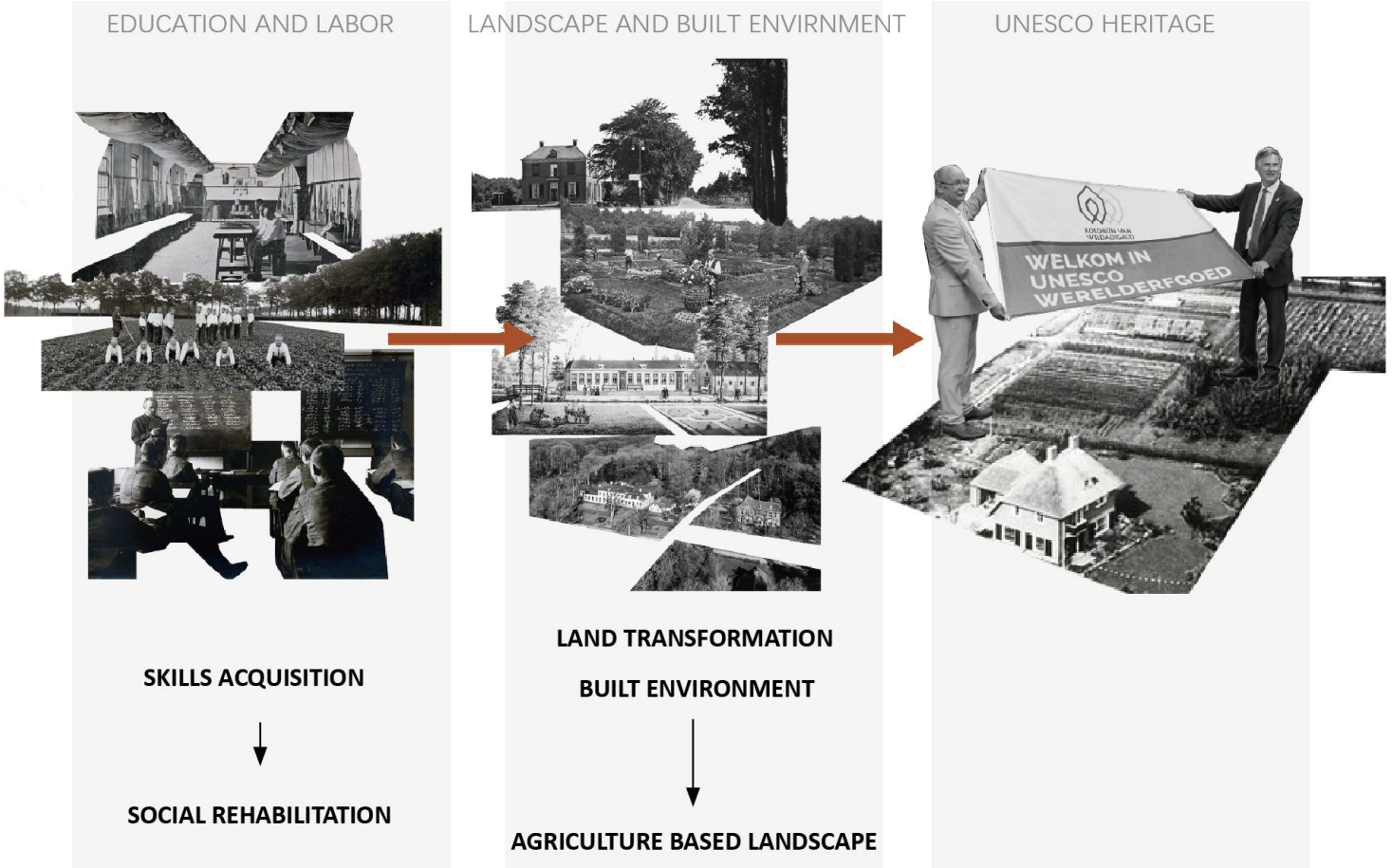


Figure 8: Image source from Koloniën van Weldadigheid on flicker

Introduction-achievements

Figure 9: Drawing provided by the author

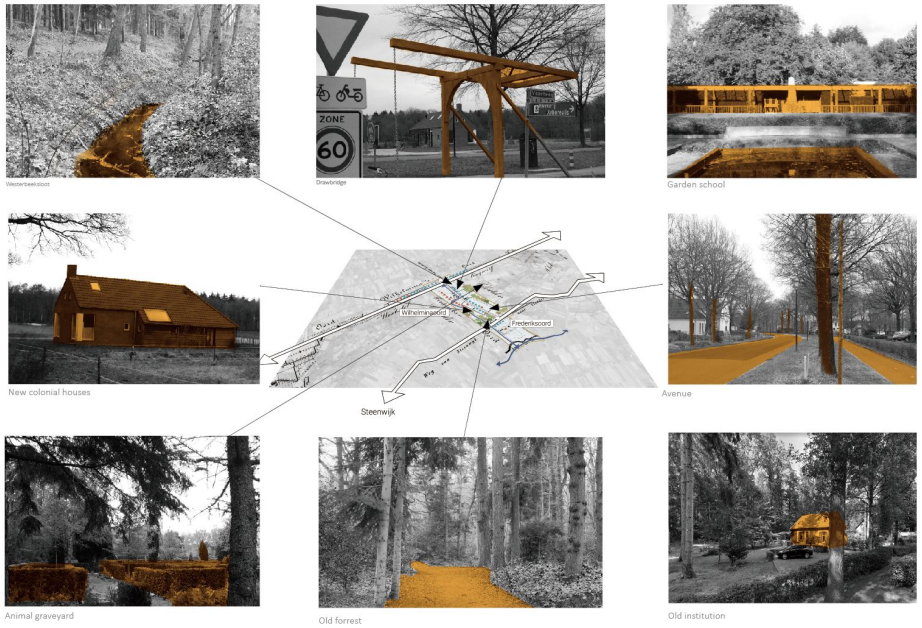
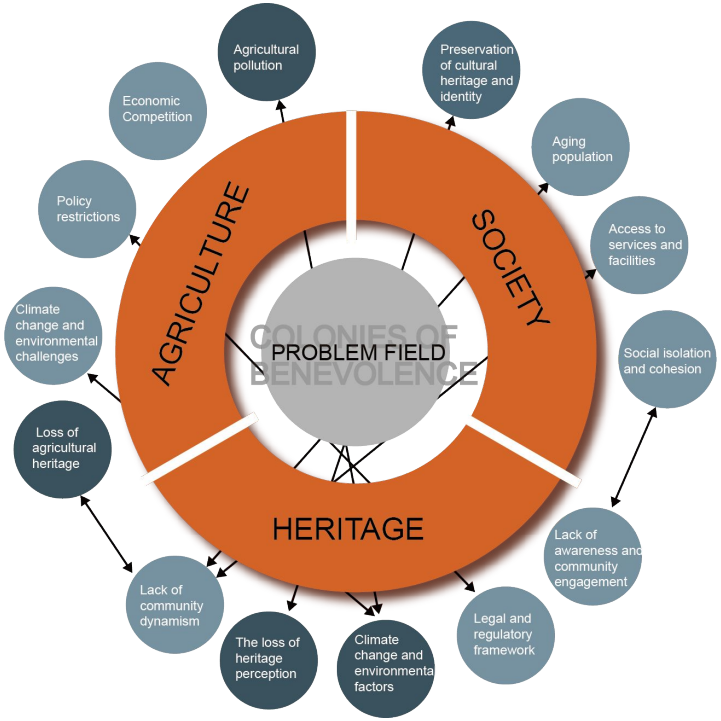


Figure 10: Pictures provided by the author

Problem field



1. Society—-------Low vitality communities.
2. Agriculture—--Unsustainable agricultural activities.
3. Heritage—------Outdated heritage conservation methods.

Figure 11: Drawing provided by the author

Problem field

1. Low vitality communities.

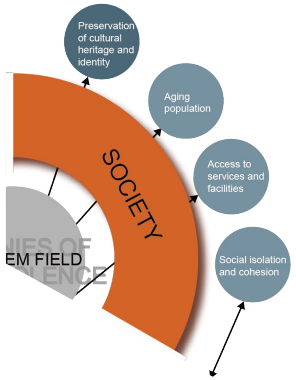


Figure 12: Drawing provided by the author

Demographic Shifts: The population of the area has changed over time, with many young people leaving to seek employment or education opportunities elsewhere. This has left an aging population, with fewer young people remaining to contribute to community life.

Lack of Community Infrastructure: There is a limited range of community infrastructure in the area, including recreational facilities and social spaces. This can make it challenging to create opportunities for social interaction and engagement.

Limited Economic Opportunities: The area is primarily rural, with limited economic opportunities. This can make it difficult to attract new residents or to create new job opportunities, leading to a lack of economic activity and vibrancy in the community.

Isolation: Frederiksoord and Wilhelminaoord are relatively small, isolated communities, which can make it difficult to create a sense of belonging and connection among residents. The lack of public transportation infrastructure can also make it difficult for residents to access services or to travel to nearby towns or cities.

Problem field

2. Unsustainable agricultural activities.

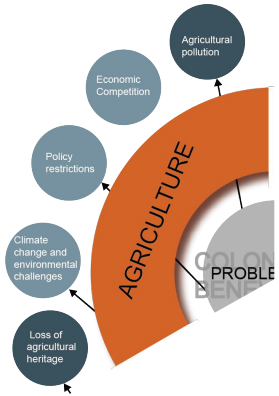


Figure 13: Drawing provided by the author

Economic Pressures: Agriculture in the area is facing economic pressures, including low prices for agricultural products, rising costs of inputs such as fertilizers and pesticides, and competition from larger-scale industrial agriculture.

Figure1.31:Large-scale mechanized production ,source:https://www.renature.co/articles/degraded-soil-can-be-improved-naturally/

Soil Degradation: The soil in the area has been heavily used for agriculture for over a century, and this has led to soil degradation. Soil compaction, nutrient depletion, and erosion are some of the problems that have resulted from intensive farming

Figure1.33:Soil that has lost its fertility,source:https://www.wur.nl/nl/nieuws/Soils-may-reduce-the-impact-of-drought-or-enhance-damage.htm

Monoculture: The agricultural practices in the area have become increasingly reliant on monoculture, which involves cultivating a single crop over a large area of land. This can lead to soil depletion, pest and disease problems, and reduced biodiversity.

Figure1.32:Monoculture crops,source:https://www.istockphoto.com/nl/search/2/film?phrase=monoculture

Water Pullotion: Agriculture requires water, and the current water management practices in the area have come under scrutiny. There have been concerns about over-extraction of groundwater, which can lead to reduced water availability and quality.

Figure1.34:Pulloted water ditch, by author

Problem field

3. Outdated heritage conservation methods.

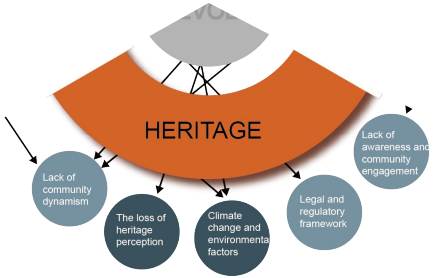


Figure 14: Drawing provided by the author

Historical Preservation Approaches: The heritage conservation approaches used in the past were focused on preserving individual buildings or structures rather than the wider landscape or social context. This approach often failed to take into account the broader social and economic changes that have affected the area over time.

Lack of Funding: Heritage conservation requires funding for maintenance and restoration, and the lack of adequate funds has been a major challenge. As a result, many of the historic buildings and structures in the area have fallen into disrepair or been lost over time.

Lack of Public Awareness: The importance of heritage conservation has not always been recognized by the wider public, which has contributed to the lack of funding and support for conservation efforts.

Changing Social and Economic Conditions: The social and economic conditions of the area have changed over time, which has made it more challenging to preserve the heritage of Frederiksoord and Wilhelminaoord. The decline of the agricultural sector and the aging population have led to a lack of resources and support for heritage conservation.

Zoning and Planning: The zoning and planning regulations in the area have sometimes been incompatible with heritage conservation efforts, which has made it difficult to preserve historic structures and landscapes.

Research question

How to use or transform agricultural and heritage resources in Colonies of Benevolence site to improve the living conditions of local residents?

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What are the agricultural and heritage resources here？

How to tackle challenges for the local agriculture industry and heritage conservation

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What is the most valuable heritage for the colonial site?

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How to use or transform agricultural and heritage resources in Colonies of Benevolence site to improve the **living conditions of local residents**?

What are local residents need?

How will the design highlight the living condition?

Methodology Framework

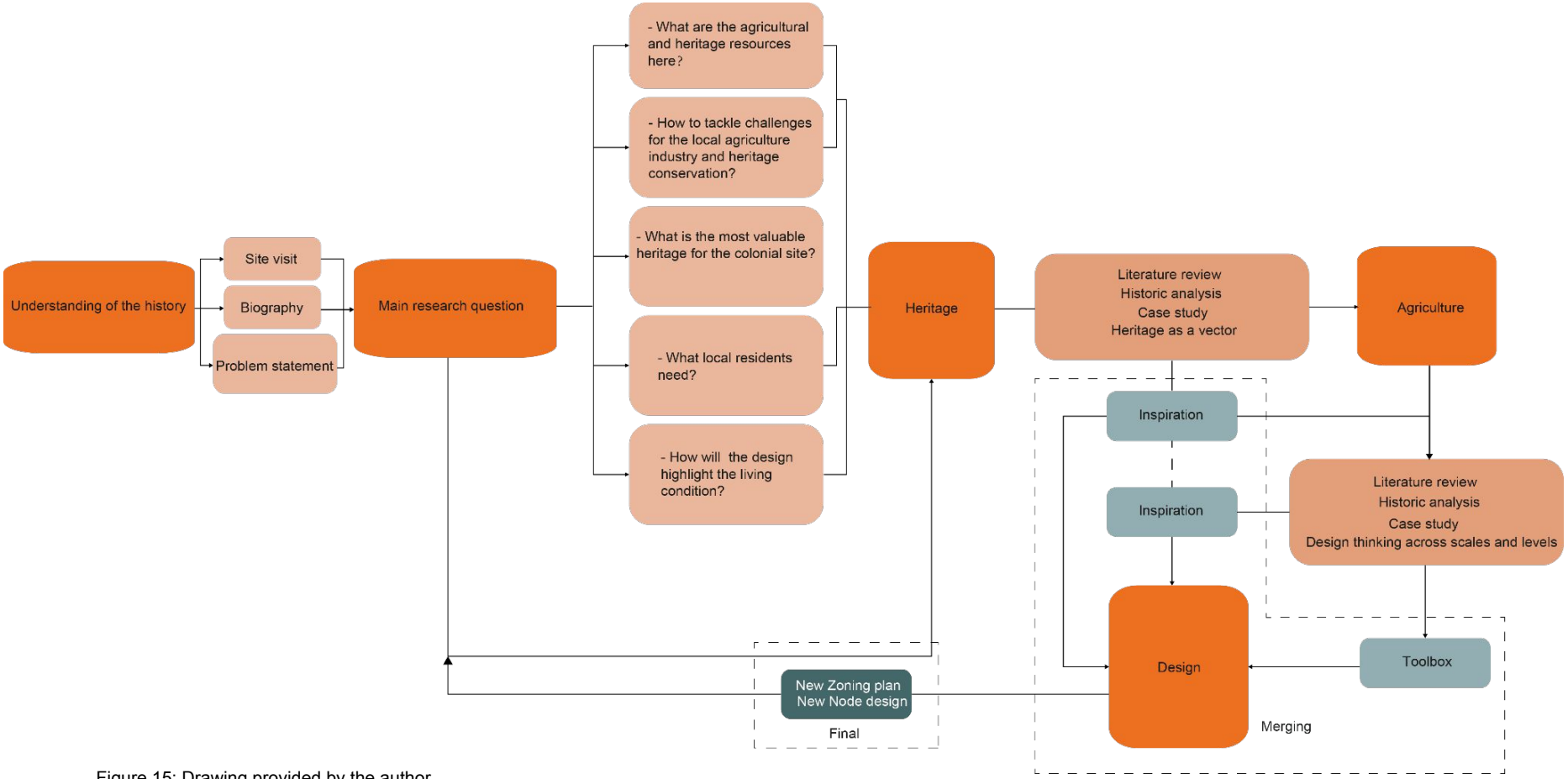


Figure 15: Drawing provided by the author

Methodology Framework

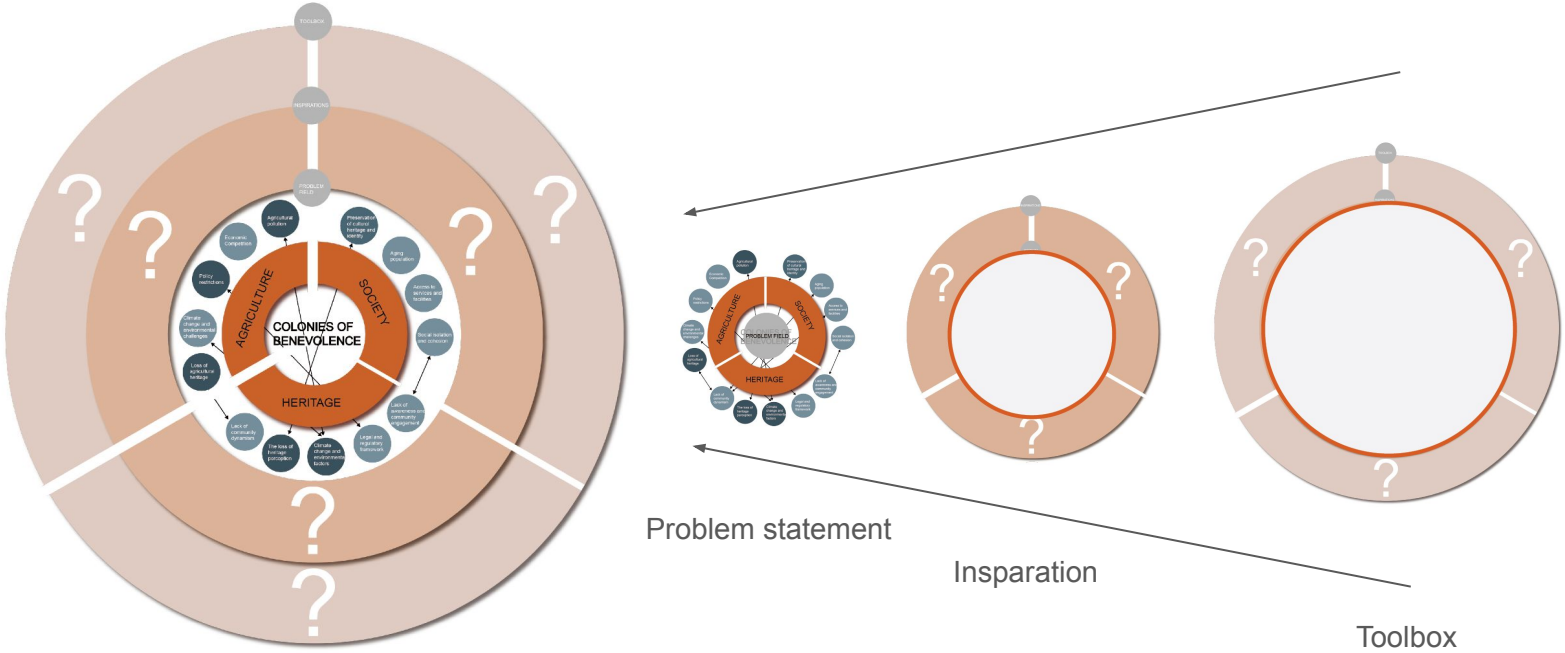


Figure 16 : Research collection structure, by author

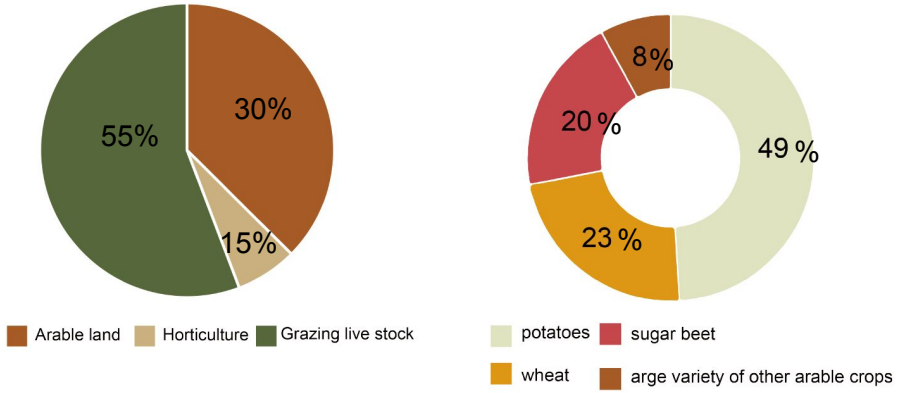
Analysis

What are the agricultural and heritage resources here？

How to tackle challenges for the local agriculture industry and heritage conservation

How to use or transform **agricultural and heritage resources** in Colonies of Benevolence site to improve the living conditions of local residents?

Analysis-agriculture



	Grass	Silage maize	Potatoes	Summer Barley	Sugar Beets
Typical livestock farm	80 %	10 %	10 %	0	0
Typical arable farm	0	10 %	50 %	25 %	15 %

Figure 17 : Share of agricultural activities and share of arable land, by author

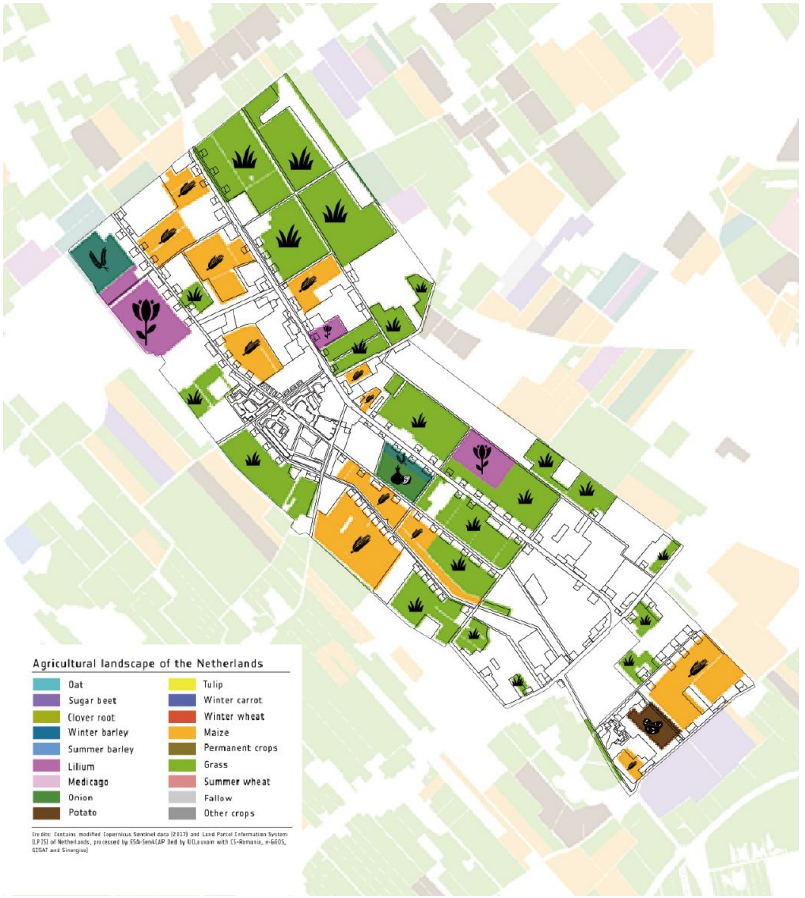


Figure 18 : Arable areas of Colonies of Benevolence, data from Drenthe archive, by author

Analysis-agriculture

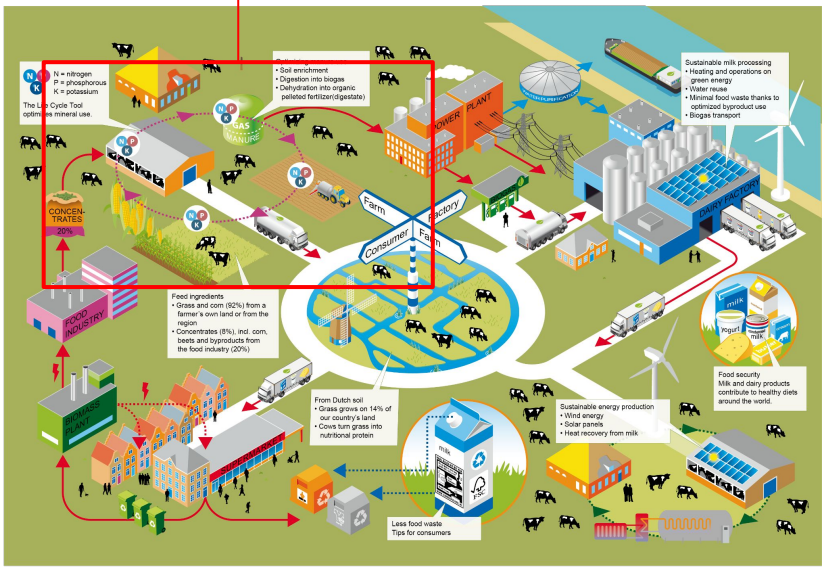


Figure 19 : The diagram shows The overall chain of the dairy industry and the circulation patterns within the production chain, by author

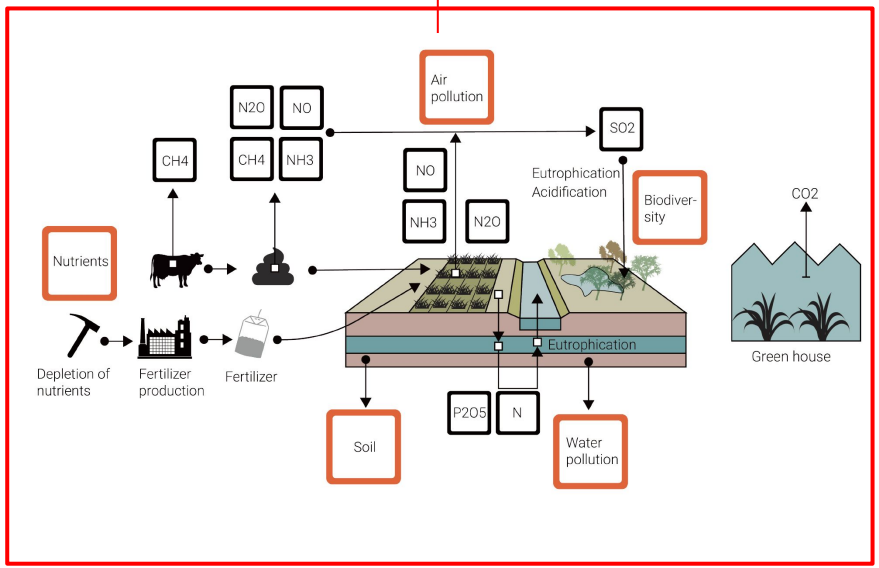


Figure 20 : The images show the pollution caused by dairy farms, by author.

Analysis-agriculture

Agriculture → Dairy farming → Ecological restoration

Analysis-heritage

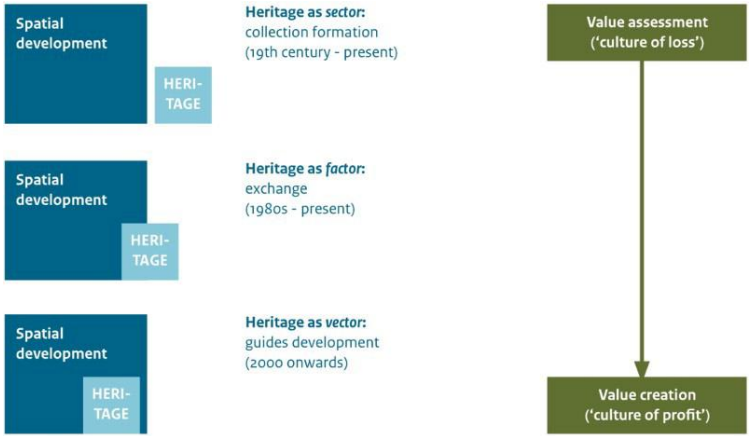


Figure 21 : Theoretical structure, from:European Planning Studies, 25 (9), 1654-1672

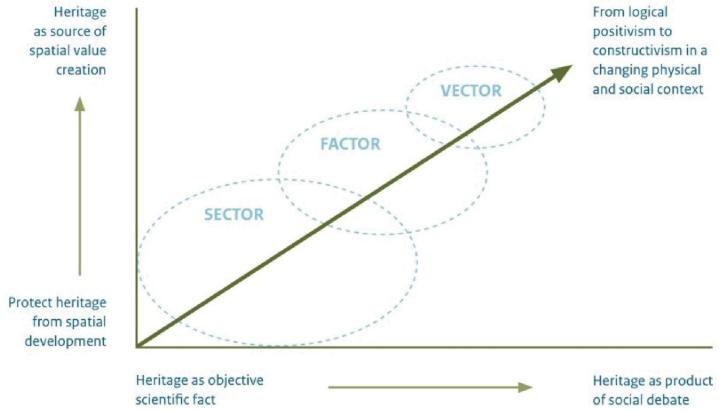
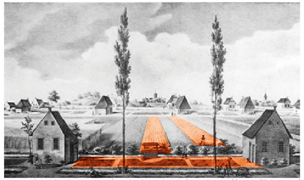


Figure 22 : Theoretical structure, from:European Planning Studies, 25 (9), 1654-1672

Analysis-heritage

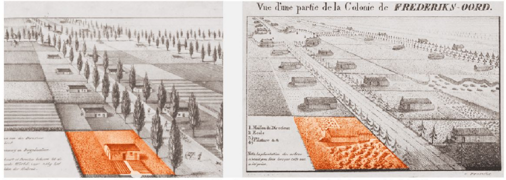
Mixed farming



P3.15 The mixed pattern of agriculture land, from https://www.flickr.com/photos/kolonienvanweldadigheid/

Mixed farming, which involves the cultivation of a variety of crops and the raising of livestock on the same farm, has been a central aspect of the Colonies of Benevolence's agricultural heritage. This approach was favored by the founders because it allowed the colonies to maintain a high degree of self-sufficiency and ensured a balanced diet for the residents. Over time, mixed farming has evolved to incorporate a range of different crops and livestock, with the specific mix being influenced by factors such as market demand, technological advancements, and the availability of resources.

Crop rotation



P3.16 The picture shows the division of the crops, from https://www.flickr.com/photos/kolonienvanweldadigheid/

Crop rotation, which involves the systematic alternation of different crops in the same field over time, is another important agricultural tradition in the Colonies of Benevolence. This practice has been employed to maintain soil fertility, reduce the risk of pest infestations, and optimize the use of available land and resources. Crop rotation has been particularly important in the Colonies of Benevolence due to the site's relatively poor soil quality and limited natural resources. By carefully planning and managing crop rotations, the colonies have been able to sustainably intensify agricultural production and minimize potential environmental impacts.

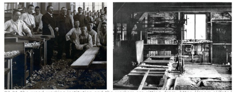
organic fertilizers

P3.17 The picture shows the farmers are working on the land with the traditional ways, from https://www.flickr.com/photos/kolonienvanweldadigheid/

P3.18 The picture shows the unferterlized friut trees, from https://www.fruithof-frederiksoord.nl/

The use of organic fertilizers and pest control methods is another significant aspect of the Colonies of Benevolence's agricultural heritage. The founders recognized the importance of maintaining a healthy and balanced ecosystem and sought to promote sustainable farming practices that minimized the use of synthetic chemicals and other potentially harmful inputs.(P3.18) Over time, these practices have evolved to incorporate a range of different organic materials and biological controls, with the specific techniques and inputs being influenced by factors such as local availability, cost, and efficacy.

Woodworking



P3.21 The wood working institution and the workers are sitting, from: https://zoom.nl/foto/huisnijverheid/888515/undefined

Woodworking has been a central aspect of the Colonies of Benevolence's craftsmanship heritage, with skilled carpenters, cabinetmakers, and joiners producing a wide range of furniture, tools, and architectural elements. Woodworking techniques and styles have evolved over time in response to changes in materials, technology, and market demand, with the colonies' artisans developing a unique and distinctive aesthetic that reflects the site's cultural and environmental context.

Metalworking

P3.23 The workers from local factory, from https://www.flickr.com/photos/kolonienvanweldadigheid/albums/72157671170233706

P3.22 The metal tools built by local factory, from https://www.flickr.com/photos/kolonienvanweldadigheid/albums/72157671170233706

Metalworking is another important craft tradition in the Colonies of Benevolence, with blacksmiths, tinsmiths, and other metalworkers producing a diverse range of goods such as tools, agricultural implements, and decorative items. Metalworking techniques and styles have also evolved over time, with the colonies' artisans adapting to changes in materials, technology, and market demand. The metalworking tradition in the Colonies of Benevolence has been particularly important in supporting the site's agricultural and industrial development, as well as its ongoing conservation and restoration efforts.

Figure 23：Koloniën van Weldadigheid Directeurswoning in Frederiksoord (Drents Archief)

Collection

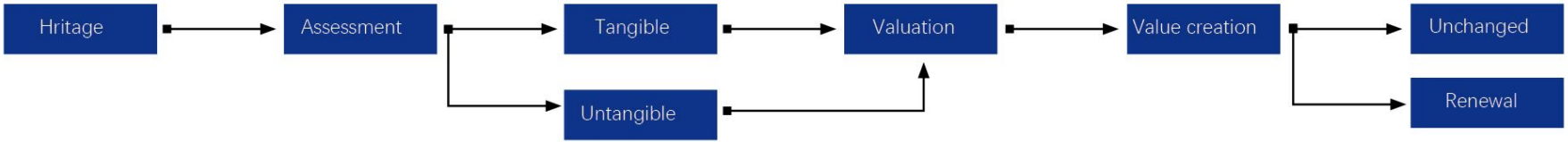
Toolbox

What are the agricultural and heritage resources here？

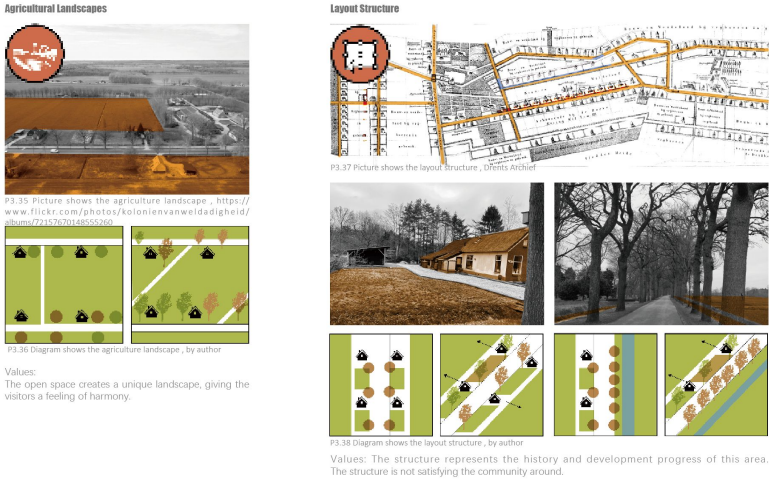
How to tackle challenges for the local agriculture industry and heritage conservation

How to use or transform **agricultural and heritage resources** in Colonies of Benevolence site to improve the living conditions of local residents?

Toolbox-hetitage



Toolbox-hetitage



Assessment

Figure 24：Koloniën van Weldadigheid Directeurswoning in Frederiksoord (Drents Archief)

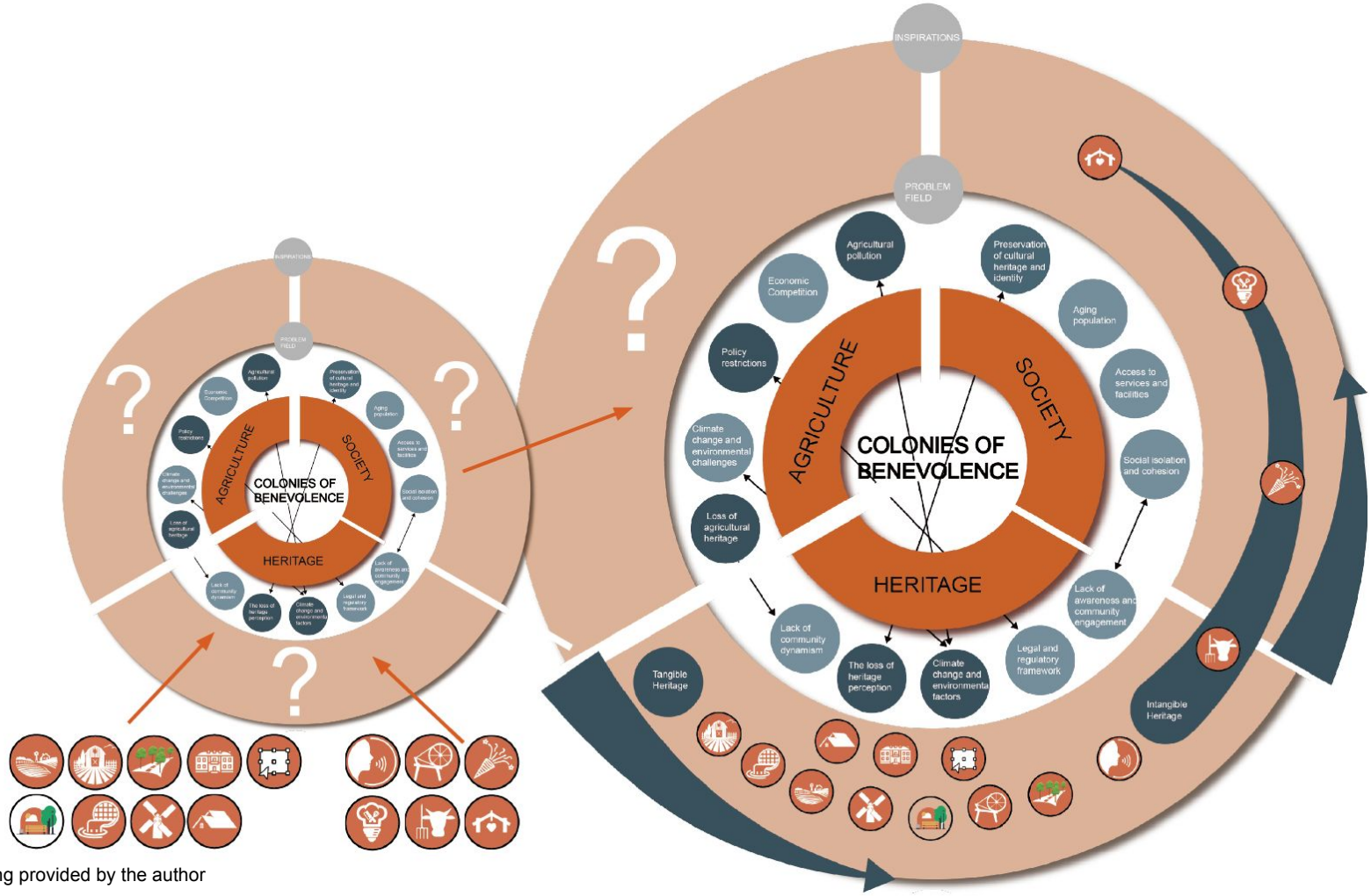


Figure 25: Drawing provided by the author

Toolbox-agriculture

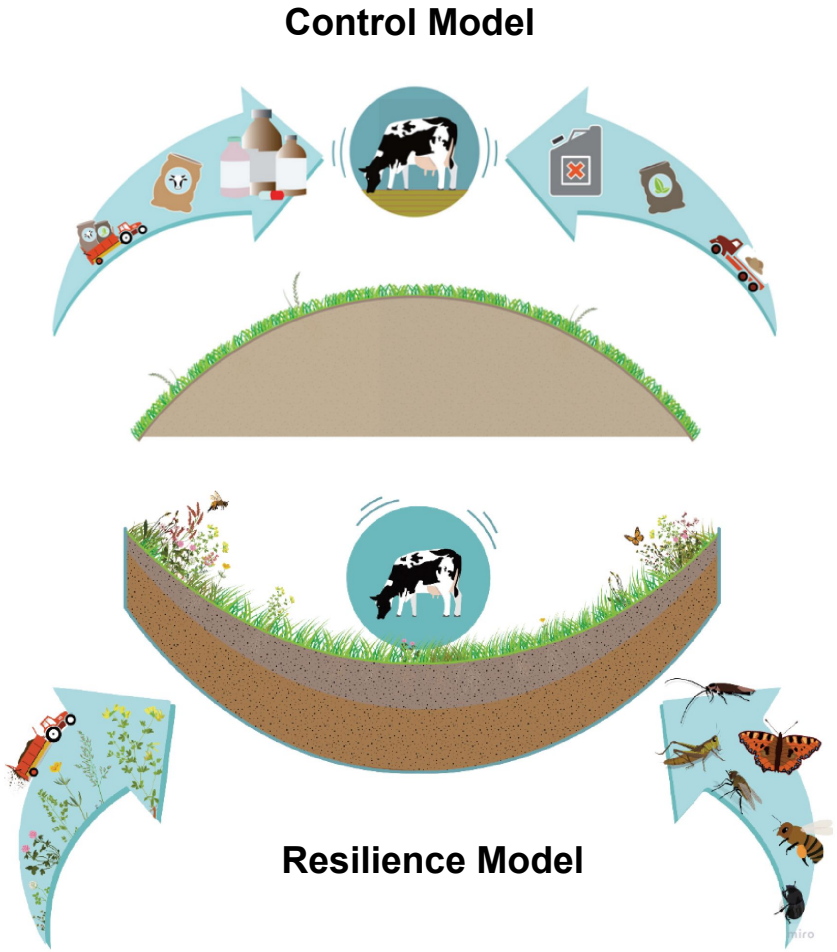
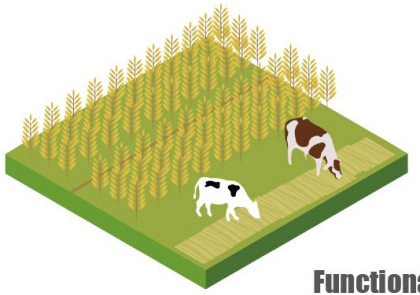


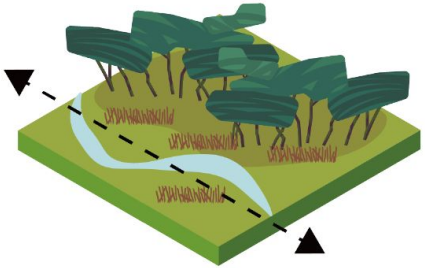
Figure 26:https://www.felixx.nl/projects/biodiversity-based-dairy-farming&lang=nl

Toolbox-agriculture

Specific species



Functional agrobiodiversity



Landscape diversity

Source areas & Corridors

Figure 27:Refference from https://www.felixx.nl/projects/biodiversity-based-dairy-farming&lang=nl

Toolbox-agriculture

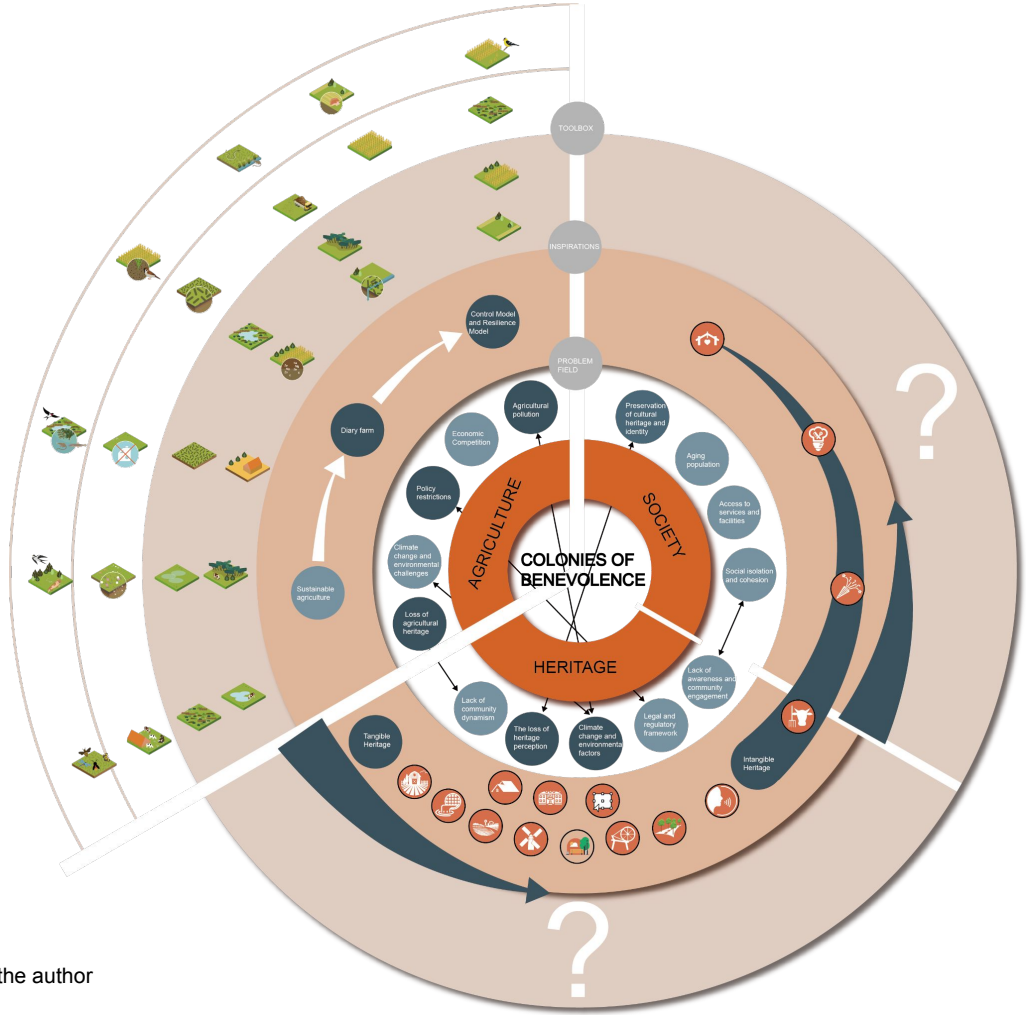


Figure 28: Drawing provided by the author

Location choice

How to use or transform agricultural and heritage resources in **Colonies of Benevolence site** to improve the living conditions of local residents?

What is the most valuable heritage for the colonial site?

Location choice

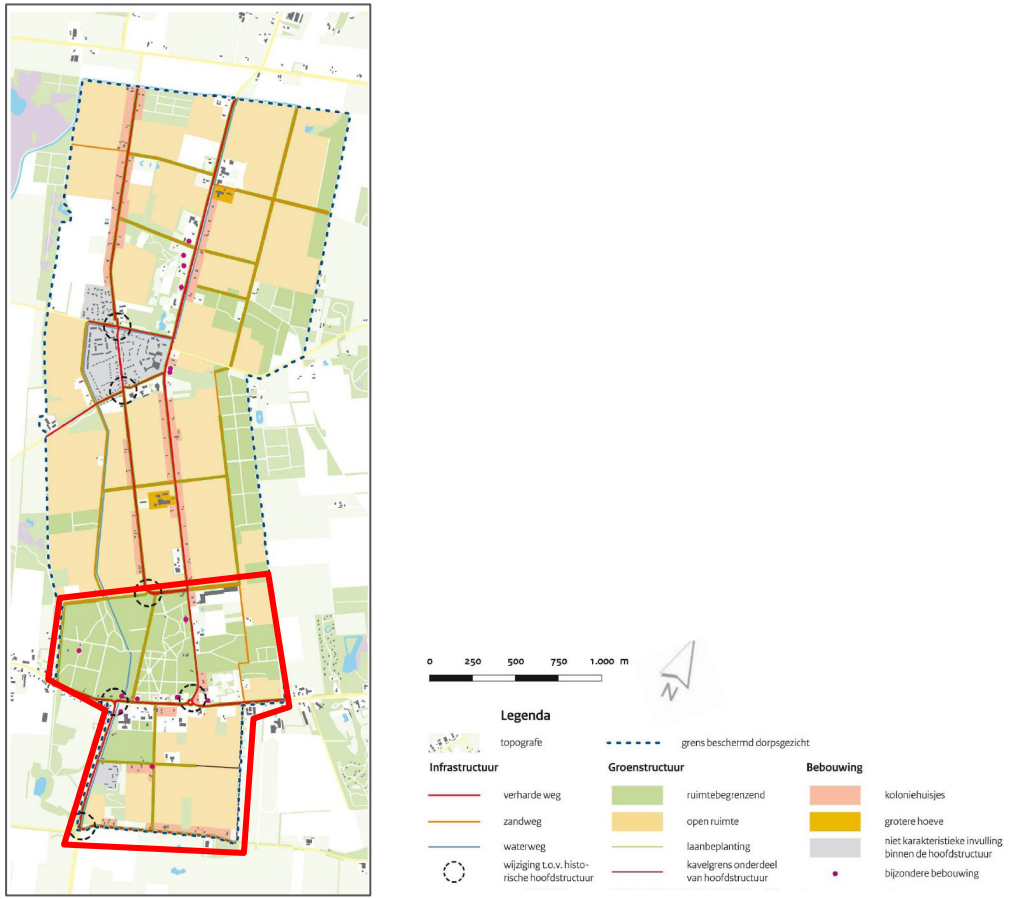


Figure 29: From Beschermd dorpsgezicht Frederiksoord-Wilhelminaoord,page132.

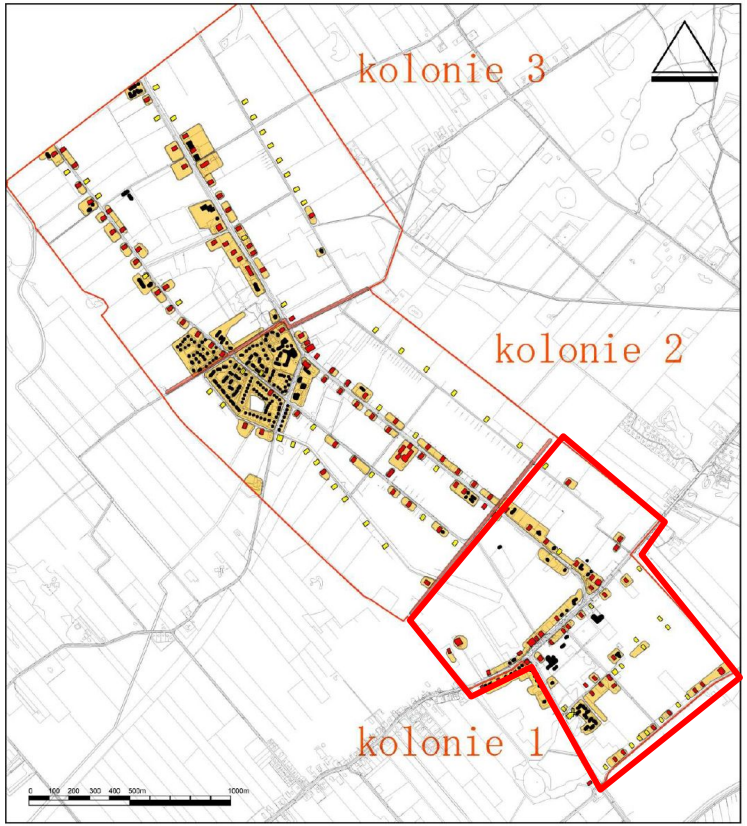


Figure 30: From Beschermd dorpsgezicht Frederiksoord-Wilhelminaoord,page143.

Location choice

Figure 31: From HEART OF FREDERIKSOORD VALUES, FRAMEWORKS AND DESIGN PRINCIPLES, page8.

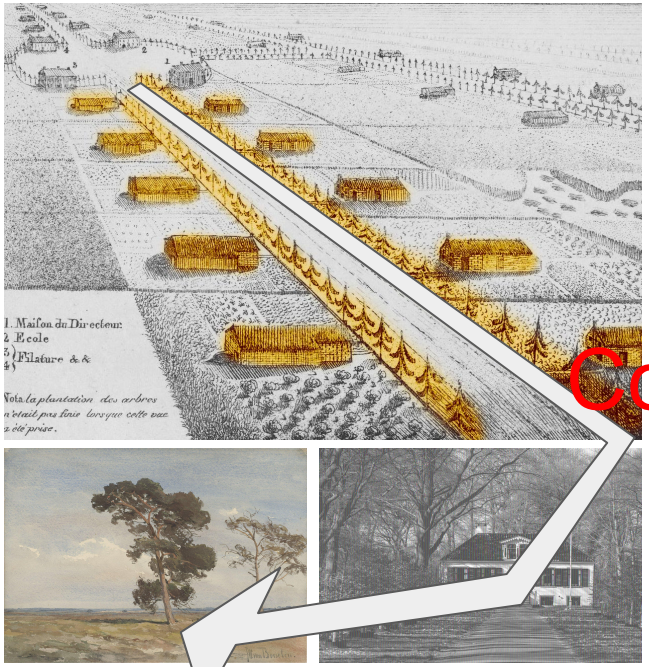


Figure 32: Koloniën van Weldadigheid Directeurswoning in Frederiksoord (Drents Archief)

Contrast

Figure 33: Cultural-historical assessment of the Frederiksoord zoning plan, 2016

Open/Linear

Enclosed/regular

Analysis-people needs

How to use or transform agricultural and heritage resources in Colonies of Benevolence site to improve the **living conditions of local residents**?

What are local residents need?

How will the design highlight the living condition?

Analysis-people needs

Interview

What do you miss in your village?	Number x named
Stores	12
skating rink	5
Pub/nightclub	5
Nice/cozy place for young people	3
basketball court	2
Playground	2
More to do for young people	2
football cage	2

Less nice points of your village	Number x named
There is not much to do	10
No store(s)	8
Are not there / everything is nice	3
Not a nice playground	2
No basketball court	2

Reasons why to go to the village hall	Quantity x	Reasons why not to the village hall	Quantity x
Cosiness/meeting place for young people	13	Boring	1
Sit / hang / otherwise there is nothing / only place where we can sit warm	5	Nothing to look for	1
Poker/darts/pool/drink	3	My friends don't live here	1
		Not interested	1
		No time	1

Questionaire

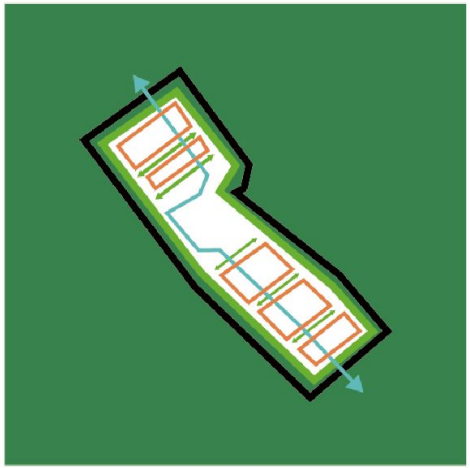
Design

How to use or transform agricultural and heritage resources in Colonies of Benevolence site to improve the **living conditions of local residents**?

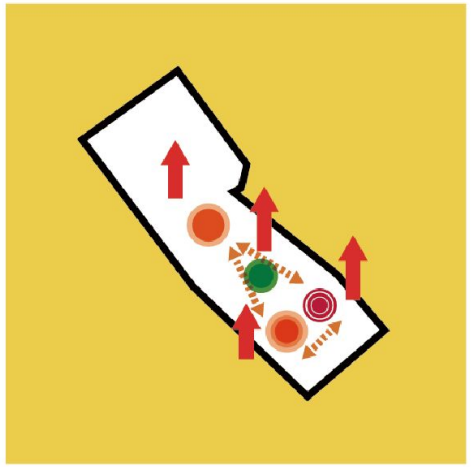
What are local residents need?

How will the design highlight the living condition?

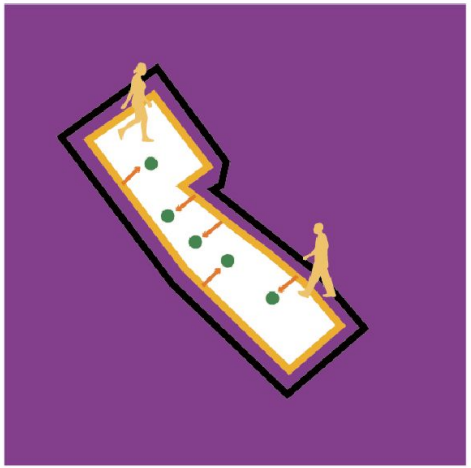
Design-vision



There will be three methods: Increasing water bodies, increasing forests, and improving soil layers to solve the problem of agricultural pollution and respond to future agricultural development issues. At present, the ecological structure here is dominated by agriculture, which has caused a large amount of eutrophication of soil and water bodies. At the same time, the fragmented green structure also makes it unsuitable for the survival of wild animals. In the future, nearly one-third of the land will be converted from agricultural land to other functions, so how to convert and utilize these spaces will become the main starting point.



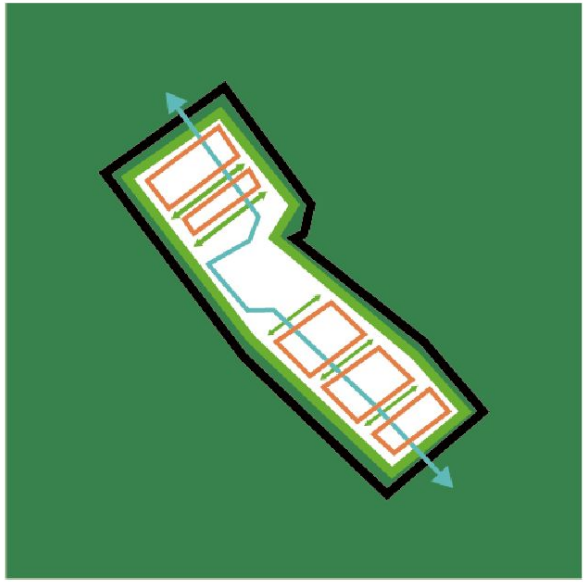
In response to the research question on how to improve the quality of life of local residents, I proposed a new collective social cooperation structure. Two colonial villages will serve as the main core of the collective village. At the same time, they will have their own dairy factory to concentrate the production capacity in the village. At the same time, there will be new community activity space and commercial space inside the village. At the same time, as the core of local tourism, the museum will serve as a tourist service center, centralizing the tour and service functions.



Ultimately, in response to my research and understanding of the heritage, and in order to enrich visitors' experiences while visiting, I proposed a design that added a new trail structure. The trail will intervene in the heritage space with a relatively low profile, but due to the staggered heights of the trail, visitors will have a different way of viewing and experiencing than usual.

The following pictures are all provided by the author

Design-eco strategy

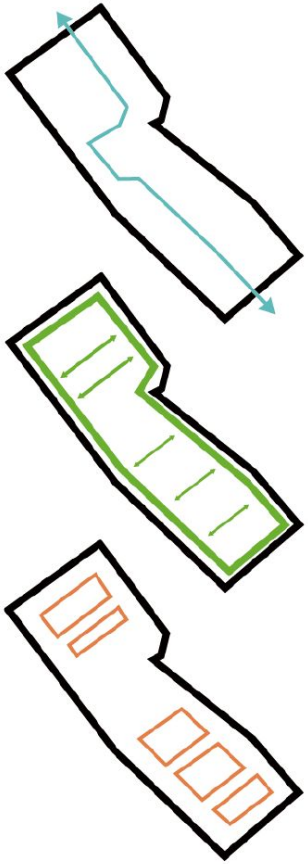


Through the analysis of the toolbox, combined with the landscape elements of the site itself, I have developed the following strategies:

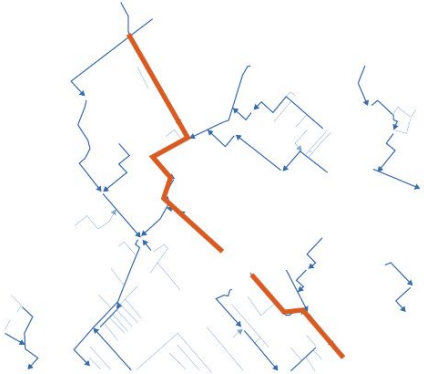
Ecological water system: Key water system elements such as wetlands and meadow were missing from the site, so in conjunction with the need for a drinking pond in the toolbox, a new water system combining ecological and animal friendly functions needed to be designed.

Green boundary: The existing pasture is predominantly grazed, but based on the needs of the toolbox for herbaceous plants and pollinators, the pasture here requires specific plant design for different areas

Herb rich grazing base: The existing pasture is predominantly grazed, but based on the needs of the toolbox for herbaceous plants and pollinators, the pasture here requires specific plant design for different areas

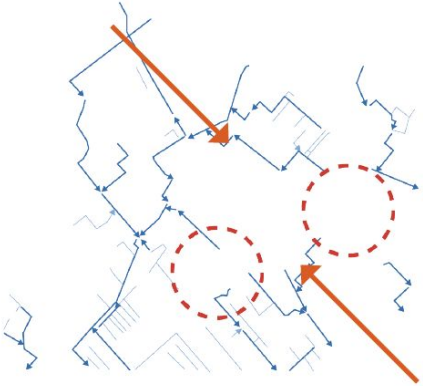


Design-eco strategy-water



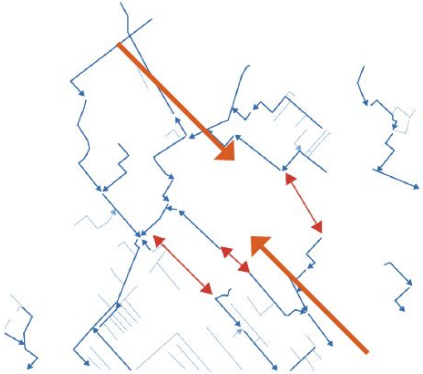
Restoration of a historically important water heritage:

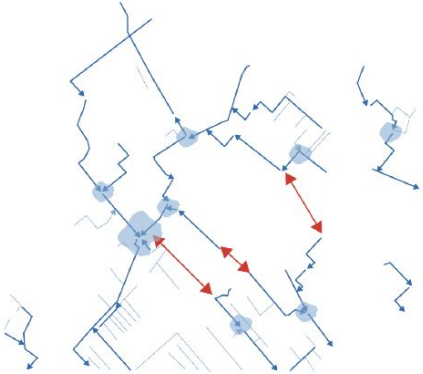
In the past, the Westerbrook river was an important irrigation and transport channel. But now it has lost its functional properties and is disconnected in the middle, so it should be reconnected spatially to enhance the connectivity of the water system.



Increasing water body connectivity

At the village scale, the water flows in a north-south direction, but there are problems with the connectivity of not only the important channels, but also the smaller canals, so the connectivity of the irrigation system should be enhanced at this level as well

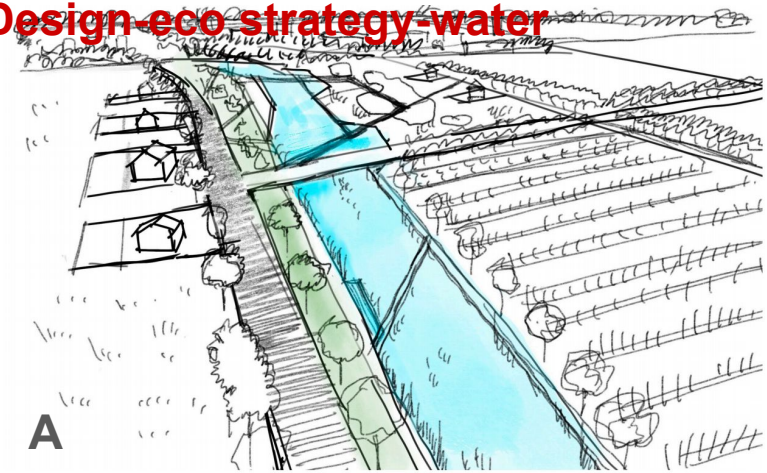


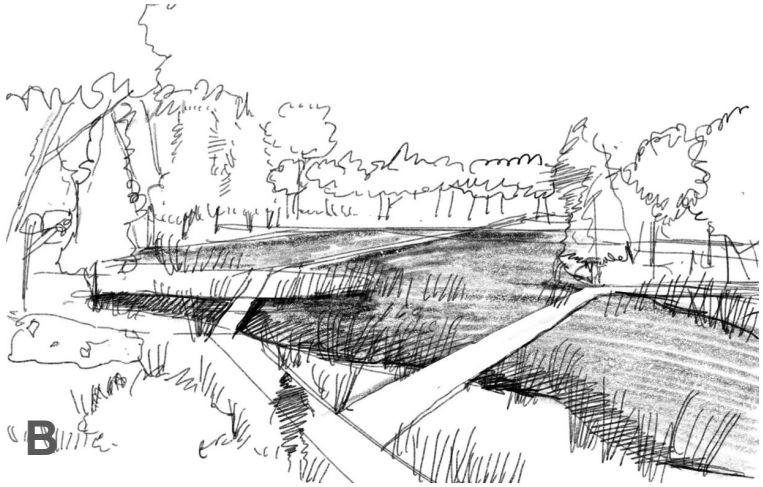


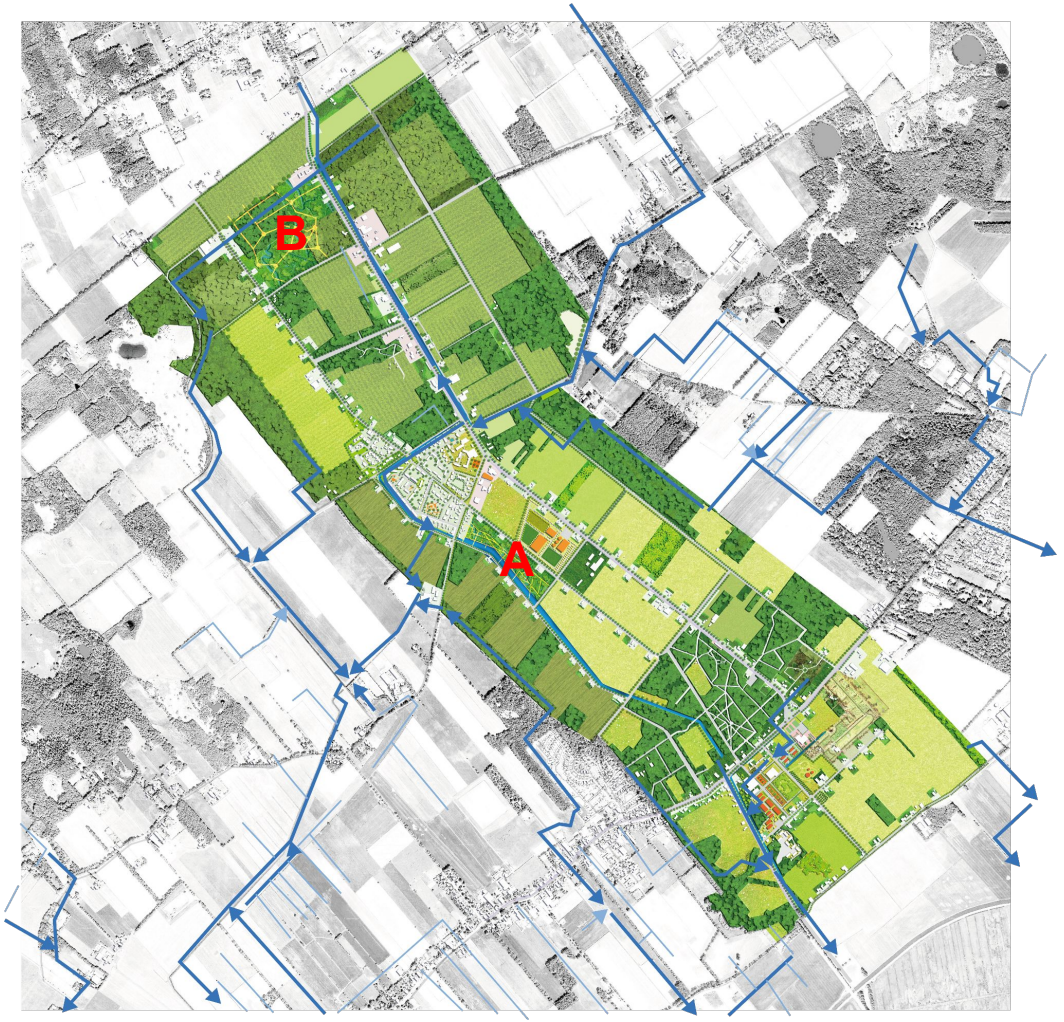
Increase in ecological wetlands

While enhancing the connectivity of the system, the enhancement of ecological functions should also be looked at. The addition of wetland and meadow water bodies at the intersection of water systems can be effective in providing water storage and increasing ecological and biological diversity.

Design eco strategy-water

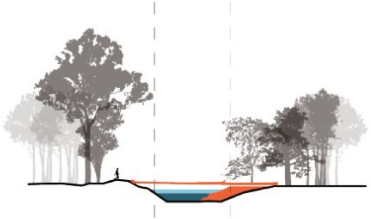




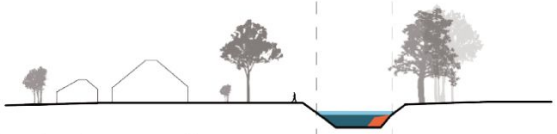


Design-eco strategy-water

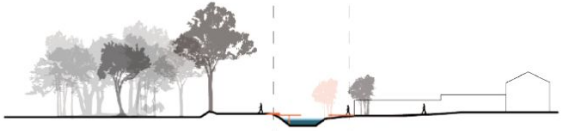
1 Water amusement



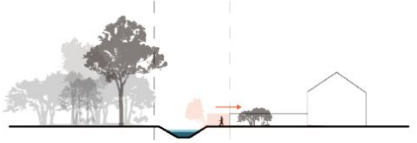
2 Widening of waterways



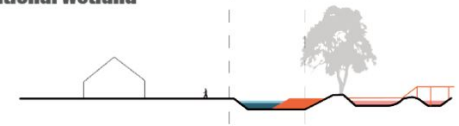
3 Neighbourhood space on the water



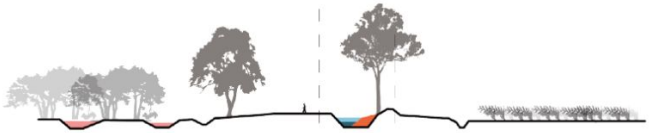
4 Open courtyard



5 Recreational wetland



6 Ecological wetland



10m 20m

Design-eco strategy-green boundary

Crop 36%

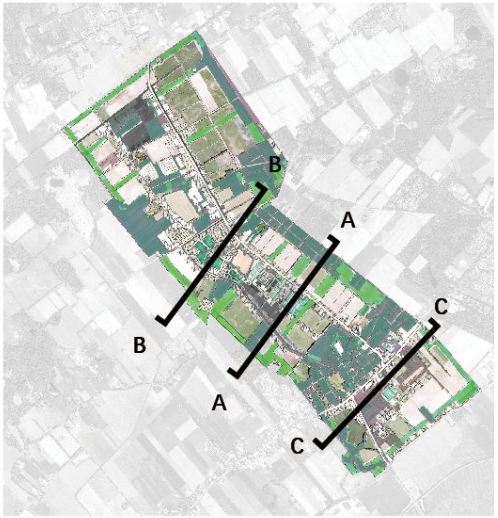
Graze 42%

Forest 22%

Crop 30%

Graze 30%

Forest 40%

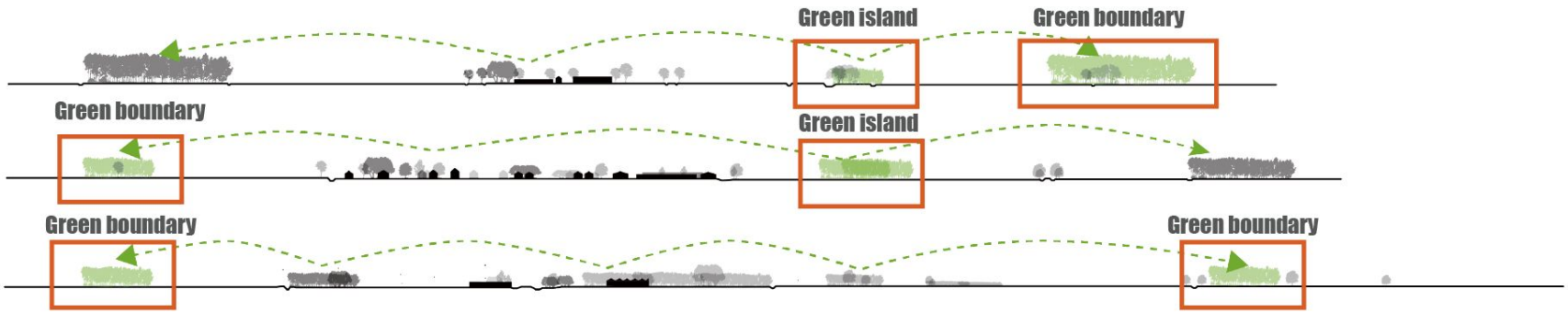


100m 200m

A-A

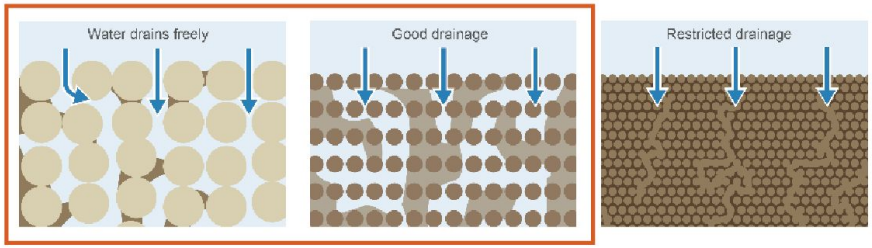
B-B

C-C



Design-eco strategy-rich herb base

SOIL TYPE



Largest soil particle at 0.06–2 mm

Smaller than sand but bigger than clay at 0.002–0.06 mm

Smallest particle less than 0.002 mm

Soil Drainage: The clay and sand combination in the soil affects its drainage properties. Clay holds water and can be prone to waterlogging, while sand has better drainage capabilities. This can impact the suitability of the soil for pasture, as excessive water retention or poor drainage can hinder plant growth. Farmers may need to implement appropriate soil management practices, such as proper land leveling, irrigation management, or soil amendments, to ensure optimal pasture growth and productivity.

Grazing strategy

Mitigation of pollution of arable land

Connection

Pasture enhancement

Grassland planting will be enhanced in three ways, with a new herbaceous layer that will attract and provide habitat for a variety of specific animals. The complex herbaceous planting will enhance the ecological role of the grazing area and add to the landscape hierarchy of the grazing area. Herbaceous plants will also mitigate agricultural pollution from the planting, and in the transition zone between the two planting patterns, the combination of flowers and herbs will not only provide habitat for pollinators, but will also serve as a bridge to other grassland and landscape elements.

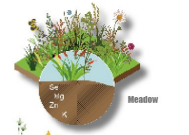
Design-eco strategy-rich herb base

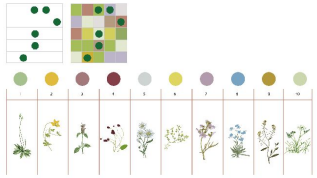
1. Timothy (Phleum pratense)
2. Meadow fescue (Festuca pratensis)
3. Amaranthus macrophylla (Amaranthus macrophyllus)
4. Common sorbet (Sorbus aucuparia)
5. Crowned dogwood (Cornus coronata)
6. Perennial ryegrass (Lolium perenne)
7. Red clover (Trifolium pratense)
8. June grass (Koeleria macrantha)

Pattern 1

1. Cock's Foot - Dactylis glomerata
2. Sheeps Sorrel - Rumex acetosella
3. Tall Fescue - Festuca arundinacea
4. Meadow Buttercup - Ranunculus acris
5. Giant Marsh Marigold - Caltha palustris
6. Cat's ear - Hypochaeris radicata
7. Rough Meadow-grass - Poa trivialis
8. White Clover - Trifolium repens

Pattern 2

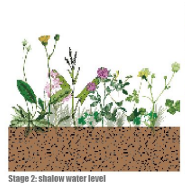


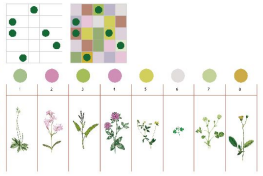


April and September

1. Narrowleaf plantain
2. Birdsfoot
3. Selfheal
4. Great burnet
5. Oxeye daisy
6. Lesser trefoil
7. Cuckoo-flower
8. Tufted Forget-me-not
9. Great yellow-cress
10 Tubular Water-dropwort

Stage 1: Deep water level

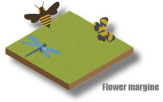


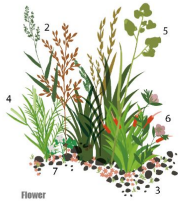


October and February

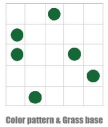
1. Narrowleaf plantain
2. Ragged robin
3. Common sorrel
4. Red clover
5. Common bird's-foot-trefoil
6. White clover
7. Meadow Buttercup
8. Common hawkweed

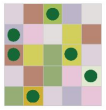
Stage 2: shalow water level



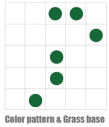


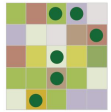
Flower





1.Tall fescue
2.June grass
3.Timothy (Meadow cat's-tail)
4.Creeping fescue
5.Cock's foot
6.Red clover
7.White clover

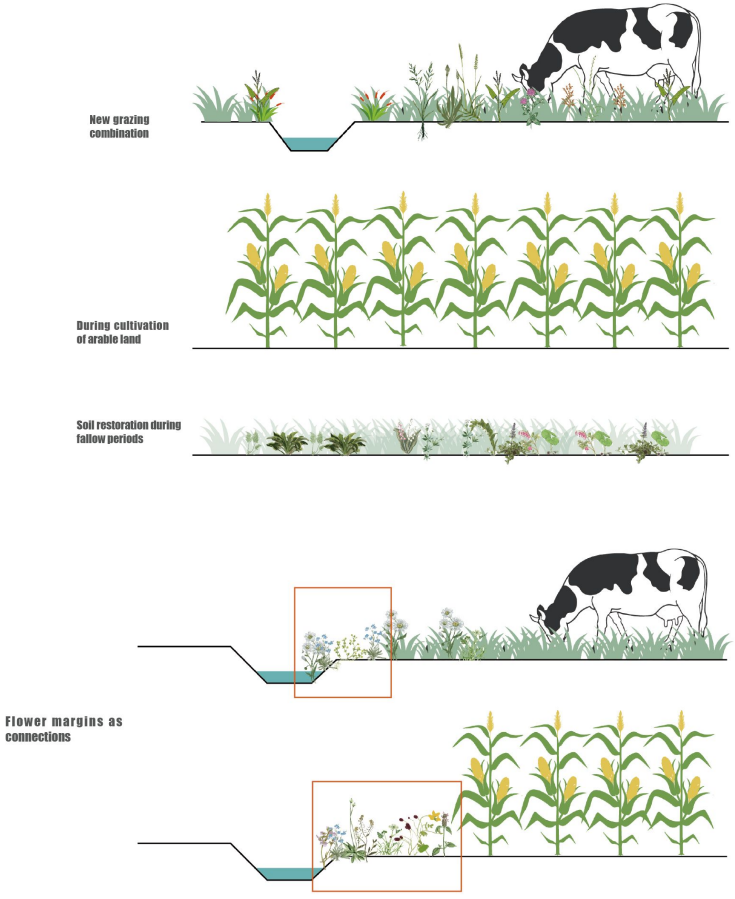


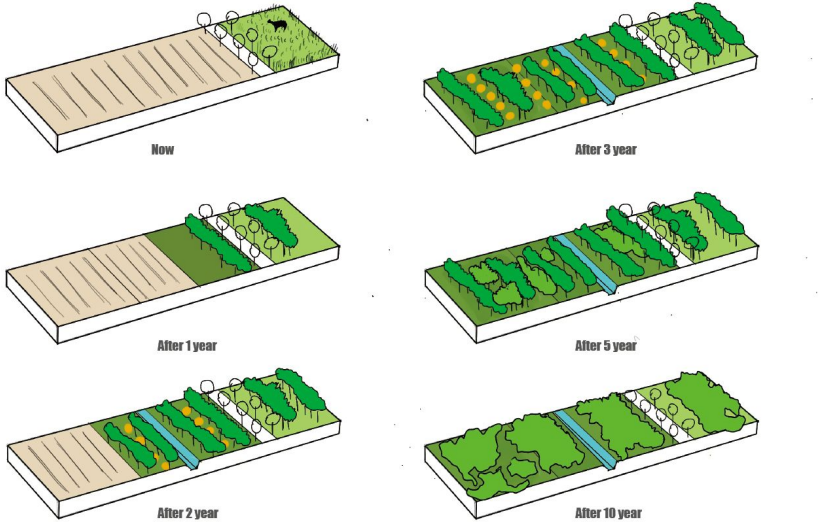


April and September

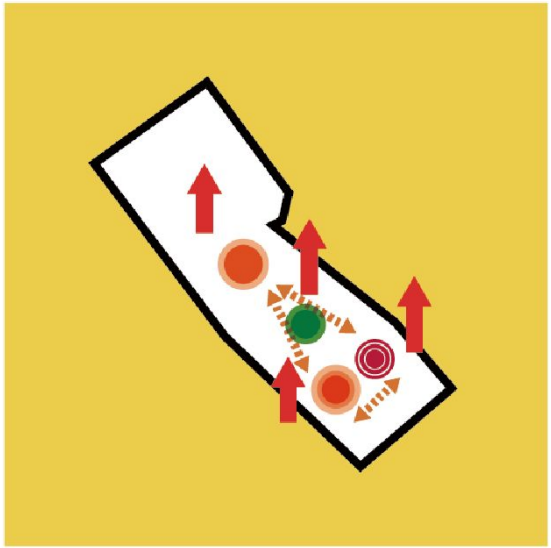
1. Narrowleaf Plantain
2. Sheep's Sorrel
3. Field Wood-rush
4. Sheep's bit
5. Cat's ear
6. Common sorrel

Design-eco strategy-rich herb base

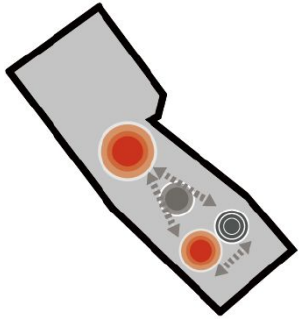




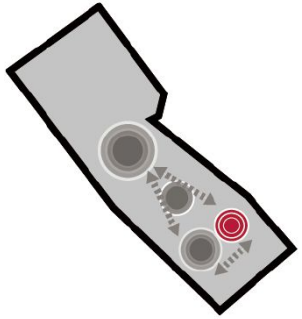
Design-Social strategy



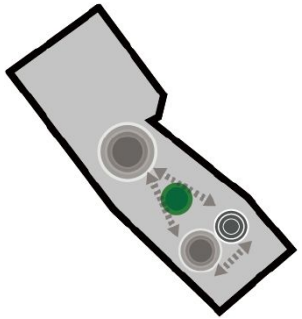
Two social hubs: The local population is mainly concentrated in the village space, but due to the high population outflow, the existing resources in the village are not suitable for the current living needs, so it is extremely necessary to improve the living standard of the local population.



Tourism hub: The tourist centre is mainly dominated by the local museum, which has developed a complete itinerary centred on the museum, but the existing structures are gradually falling into disuse due to lack of maintenance and management

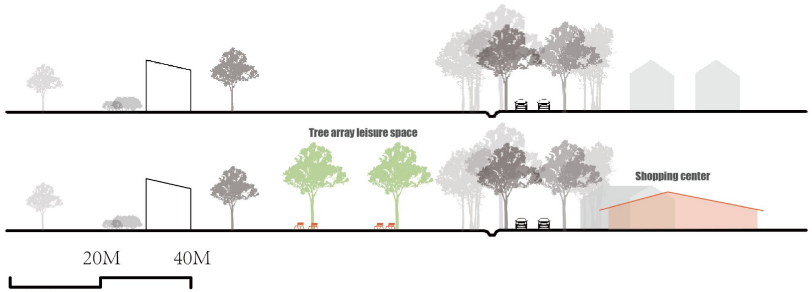


Collective farming hub: Collective farms have been an element of local lifestyle and spatial composition in the past, but the current social environment is not necessarily suitable for a collectivist lifestyle, so the establishment of a collective factory can reduce the production costs of the local population and at the same time perpetuate the spiritual legacy of collectivism

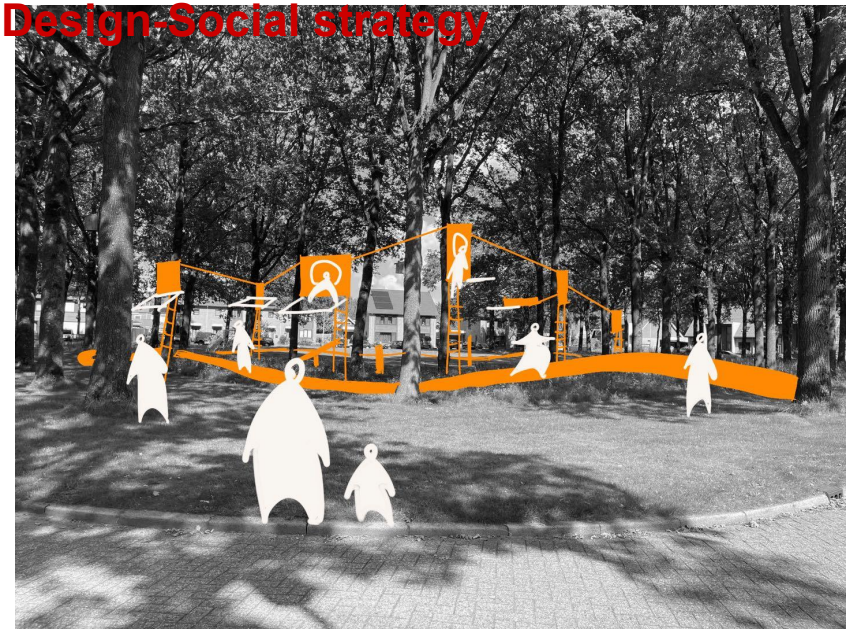


Design-Social strategy

Design-Social strategy

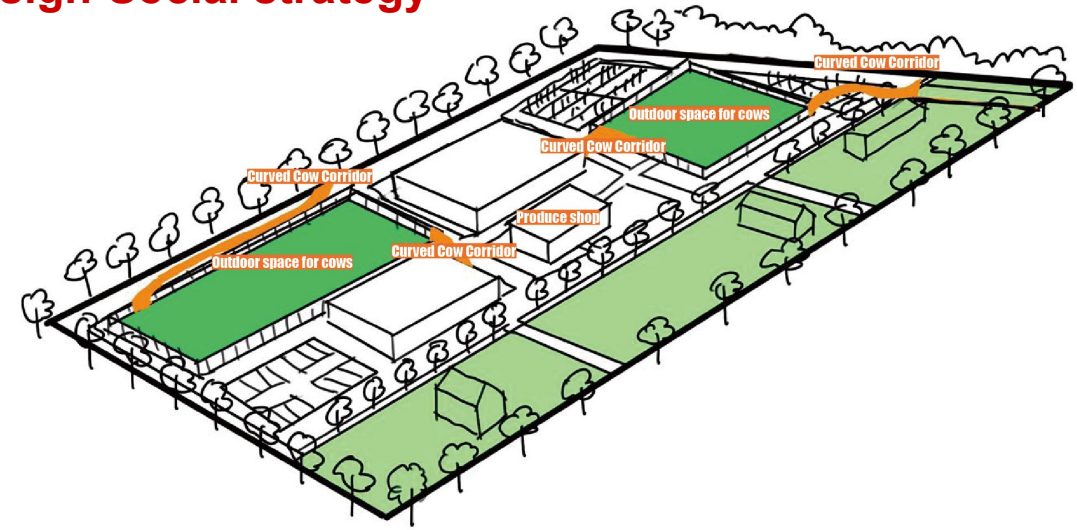


Design-Social strategy



Design-Social strategy

Design-Social strategy



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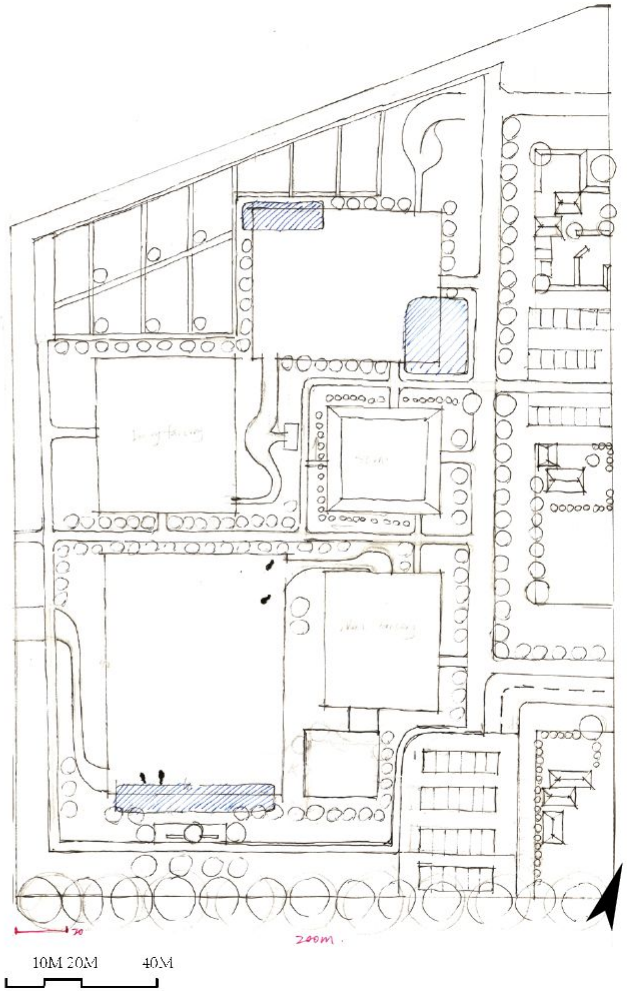
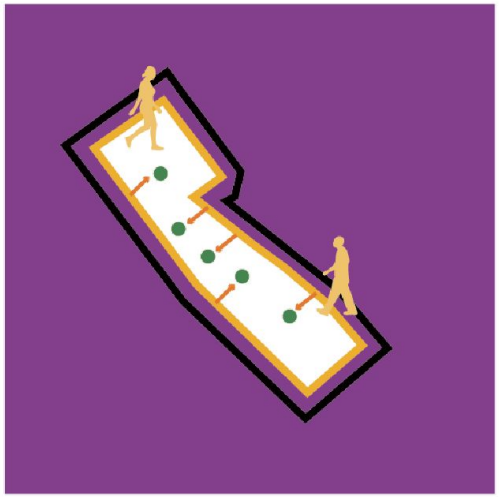


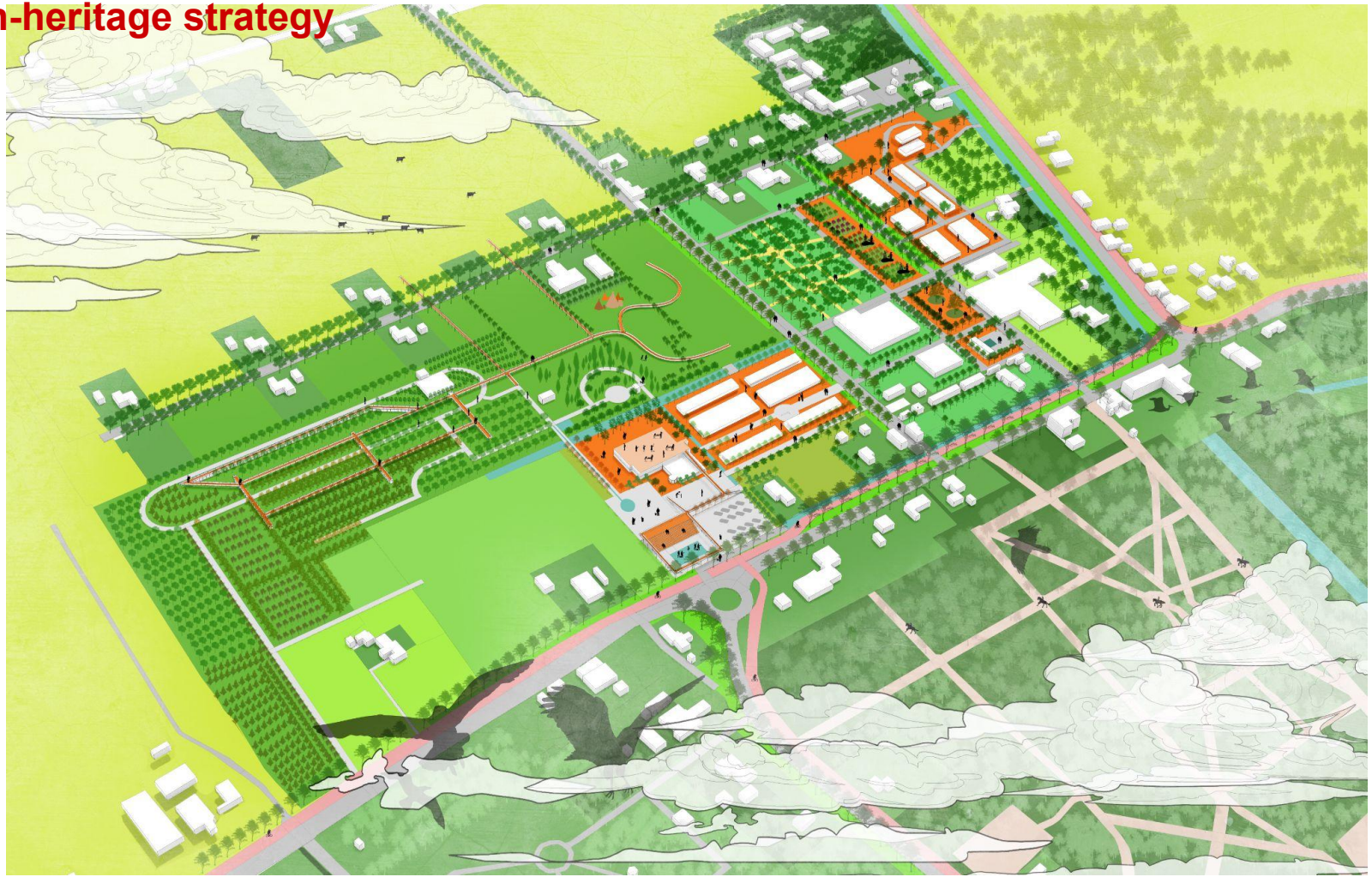
Design-heritage strategy



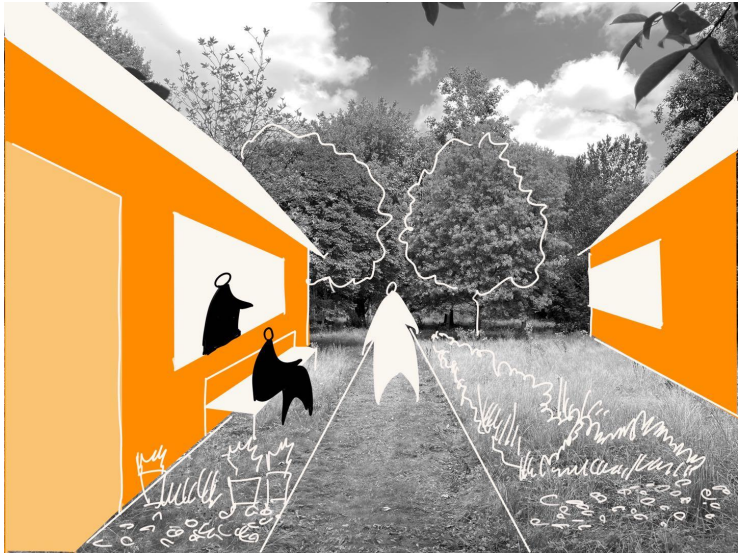
The complexity of heritage makes it impossible for us to look at a certain element of heritage from a single perspective. Therefore, after designing at the basic ecological and social levels, I chose to face the research direction of heritage with a more abstract attitude. After my research, I found that the existing site lacked pedestrian trails and diverse experience methods and viewing angles, so on this basis, I chose to add a complete tourist trail to provide tourists and local residents with new observations angle.

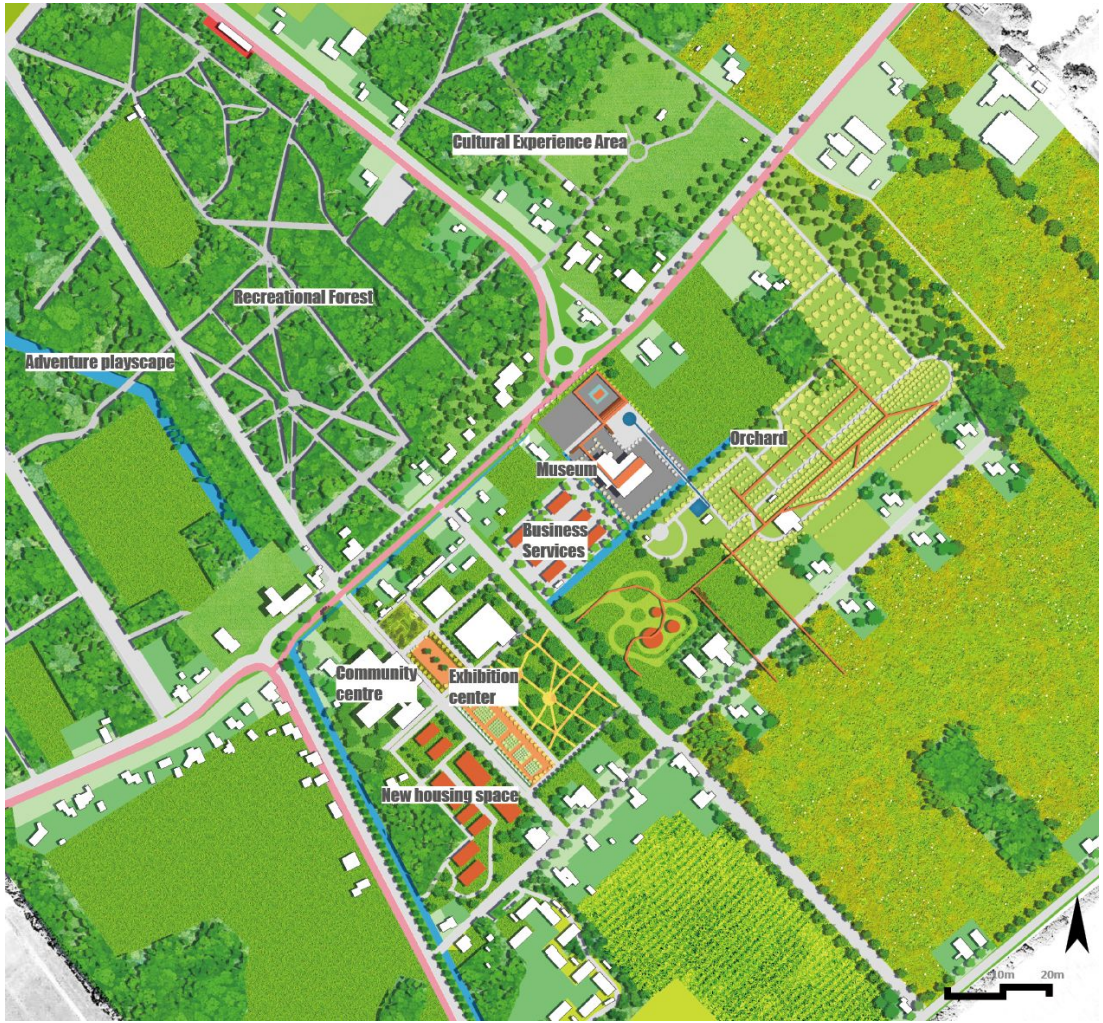
Design-heritage strategy

Design-heritage strategy

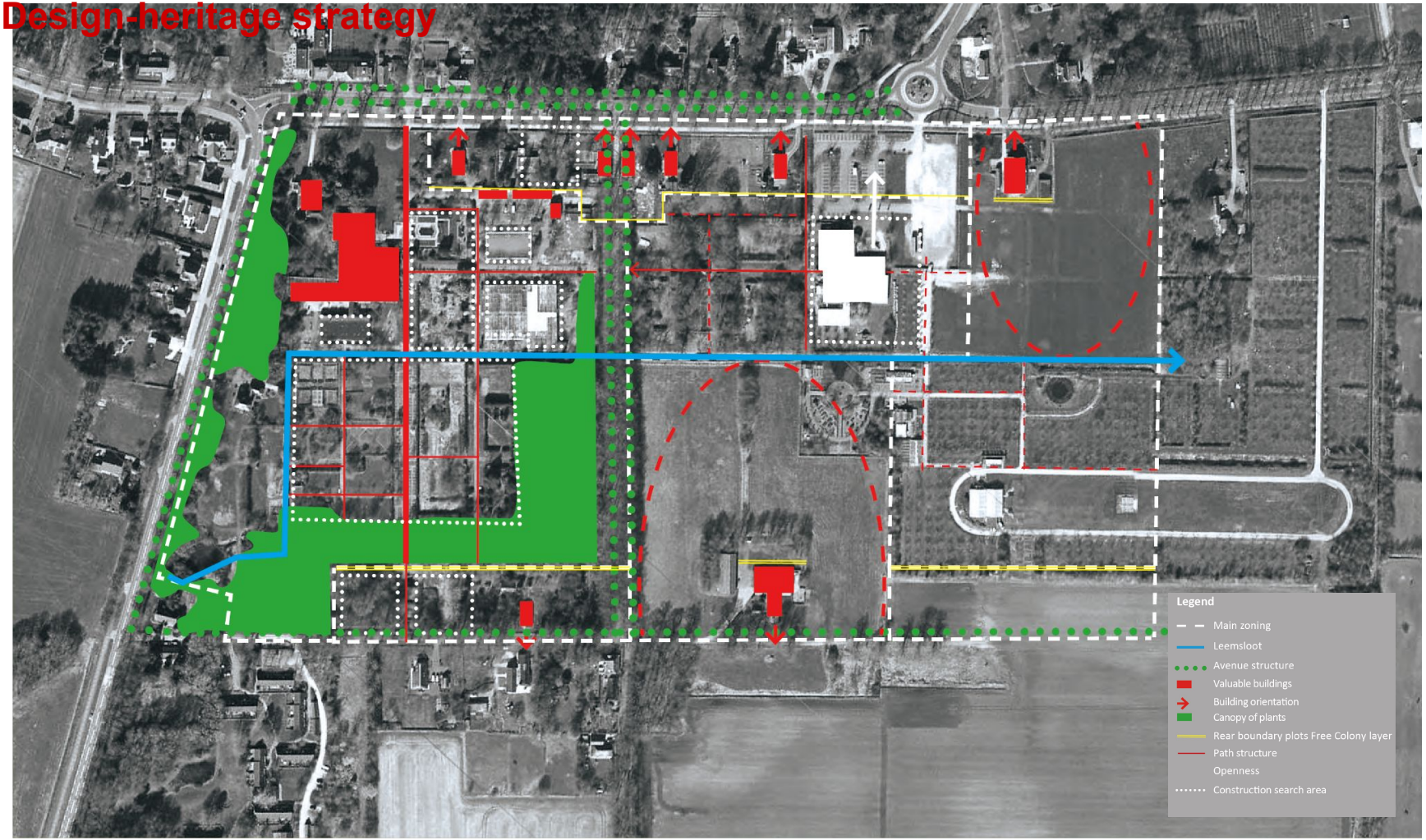


Design-heritage strategy

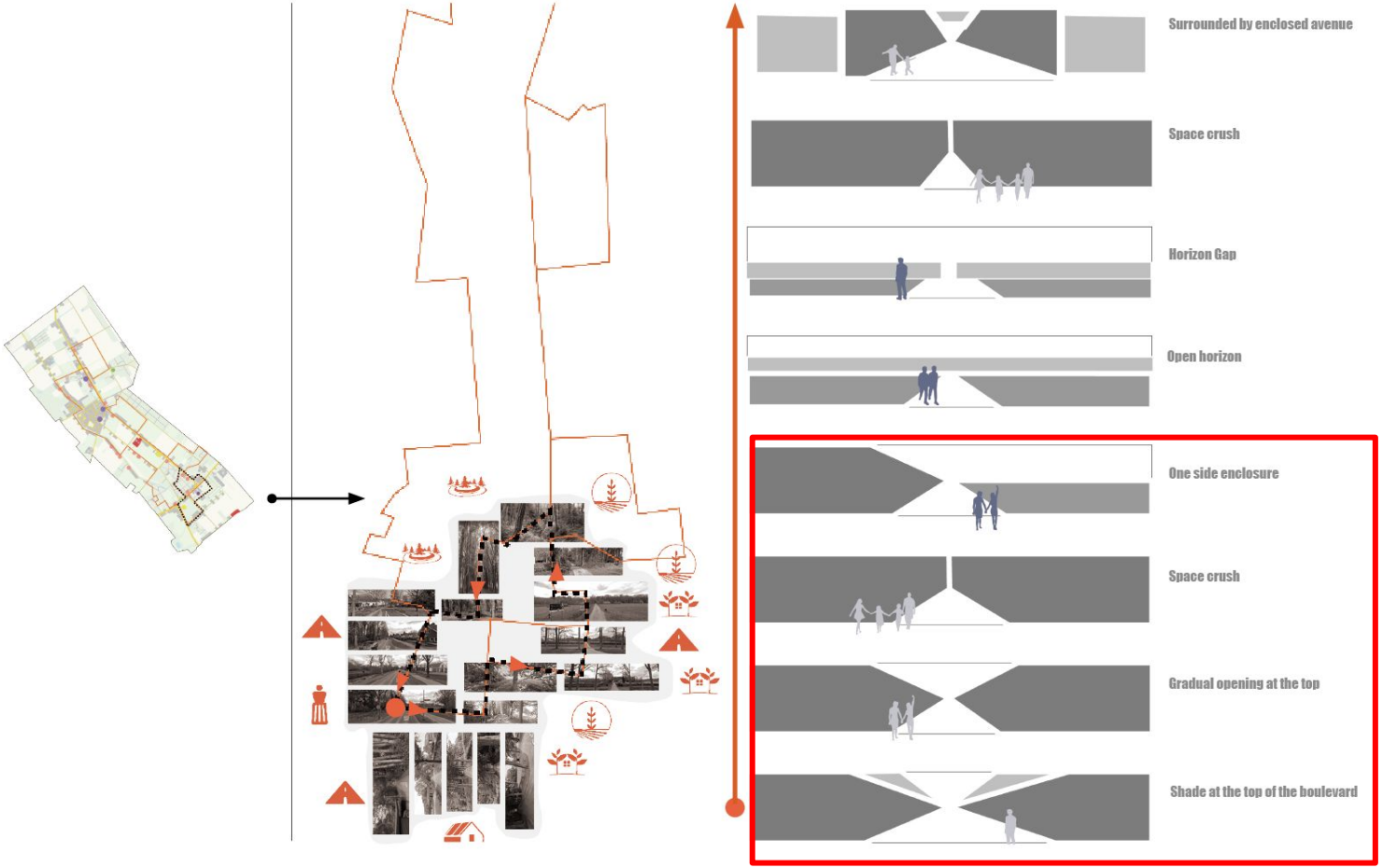




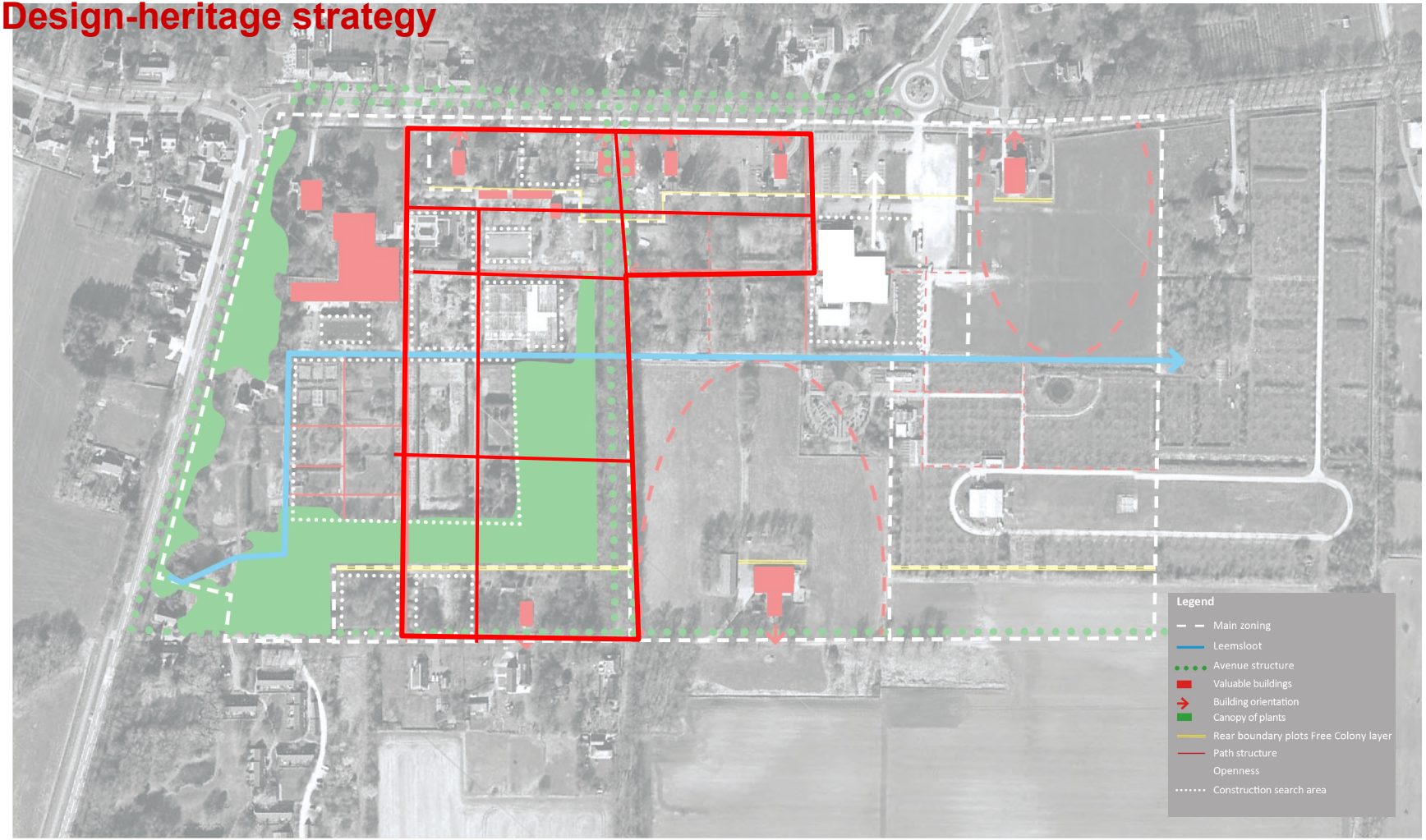
Design-heritage strategy



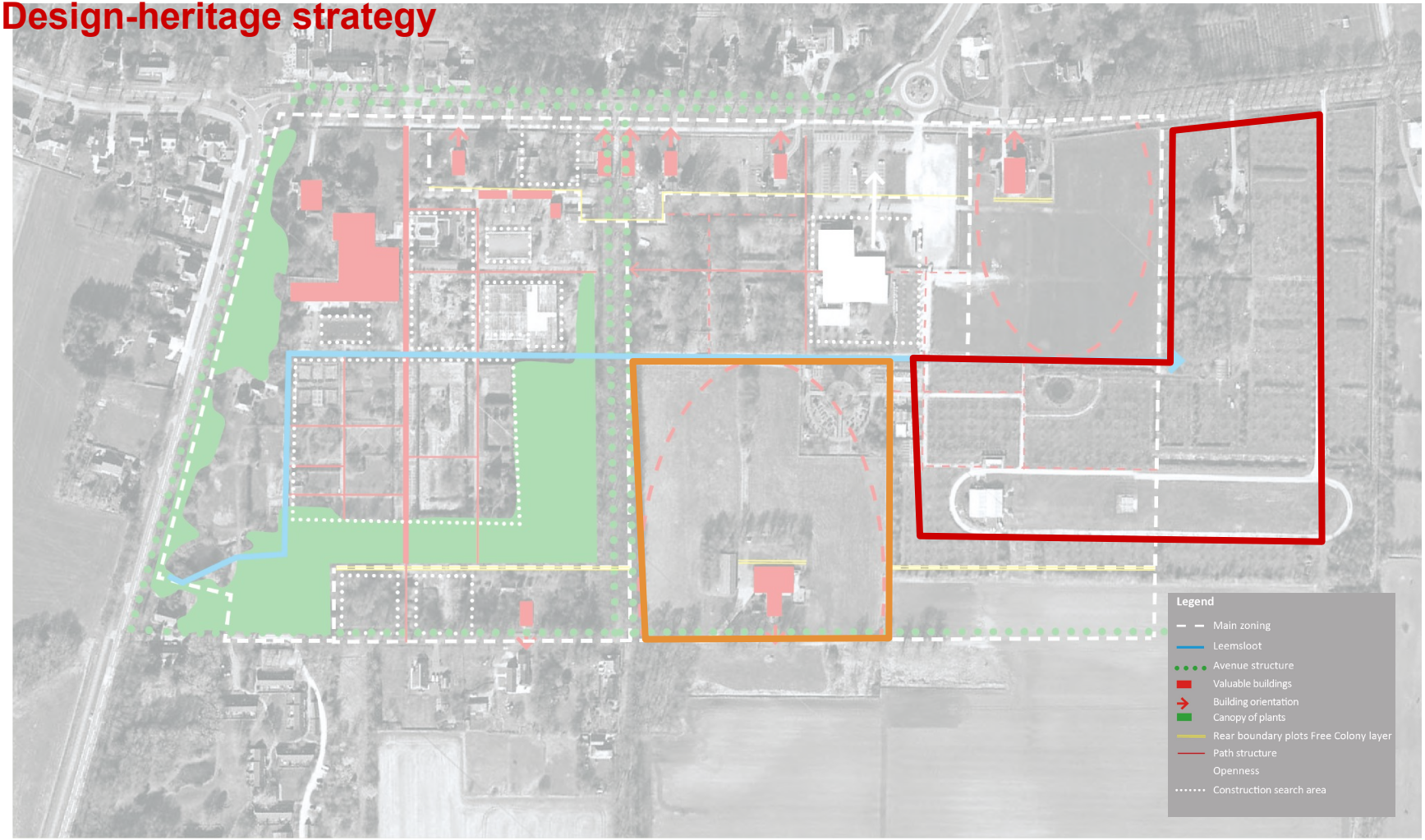
Design-heritage strategy



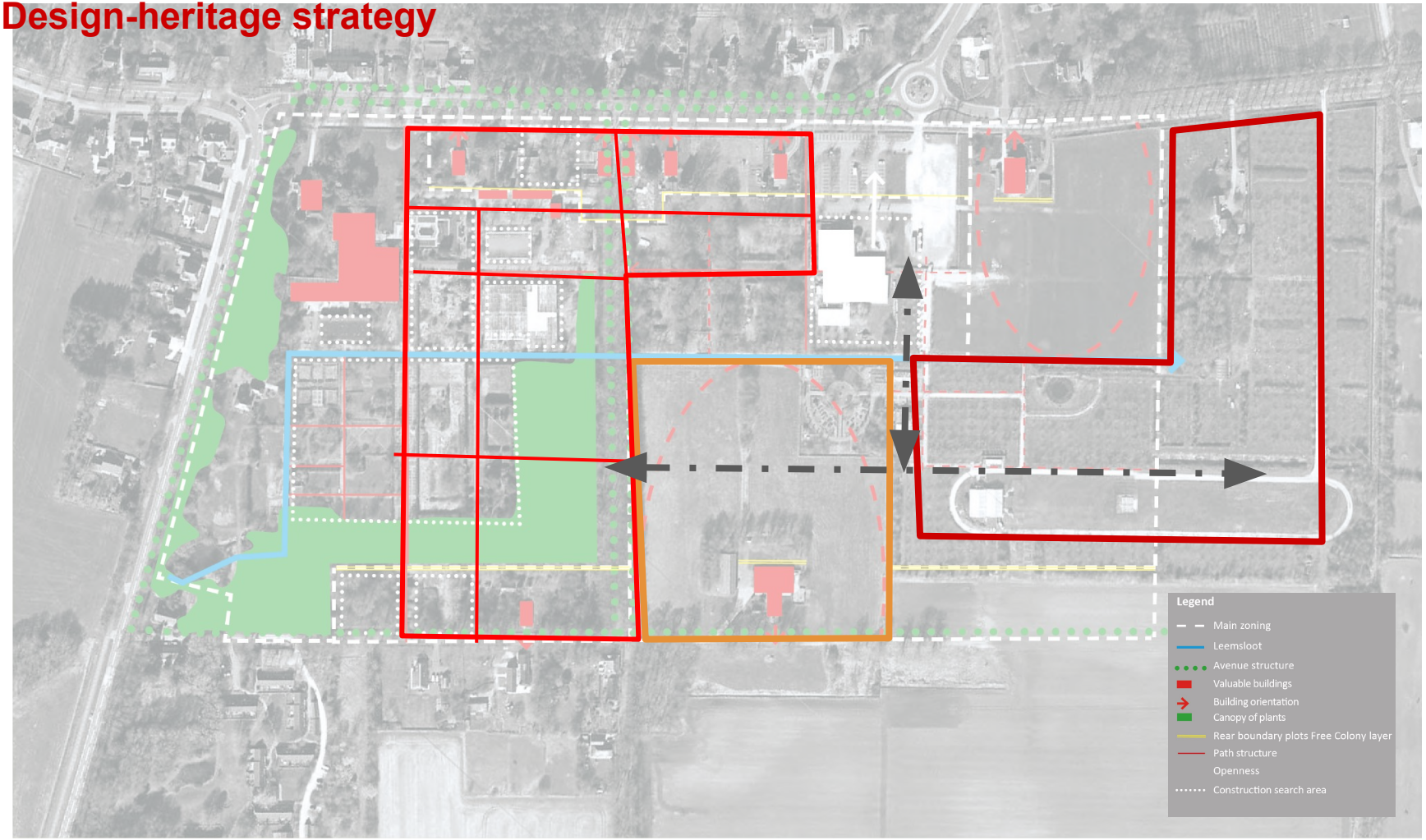
Design-heritage strategy



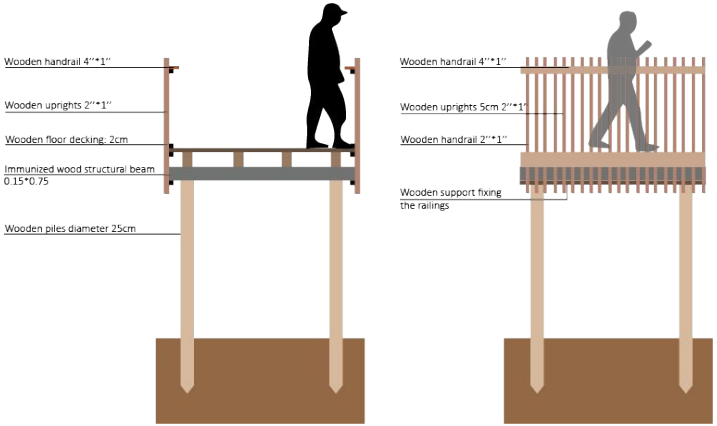
Design-heritage strategy

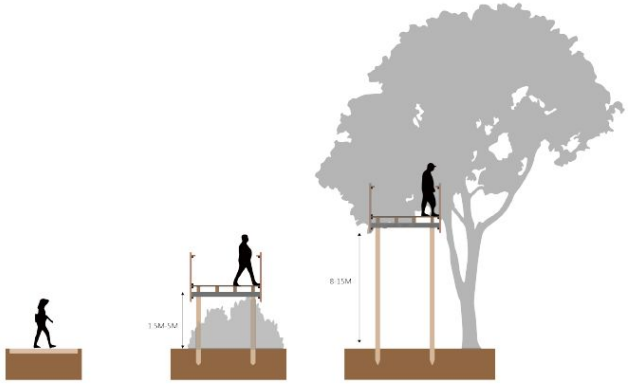


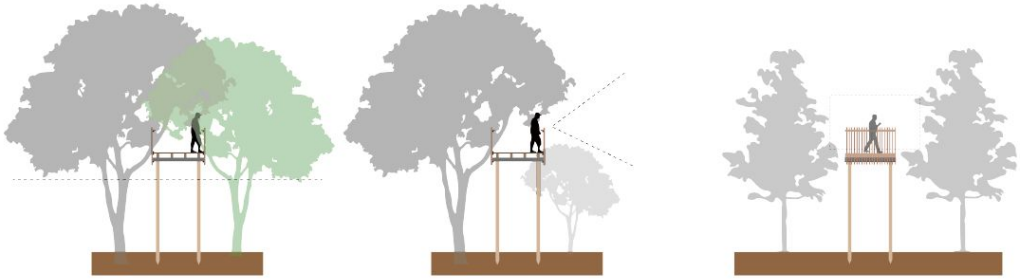
Design-heritage strategy



Design-heritage strategy

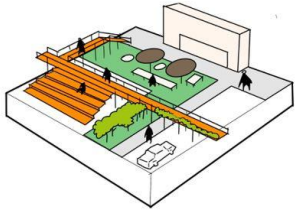




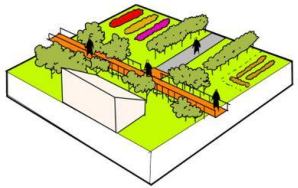


Design-heritage strategy

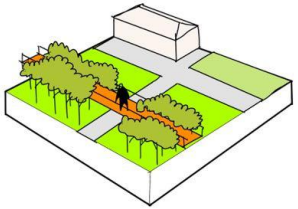
Museum



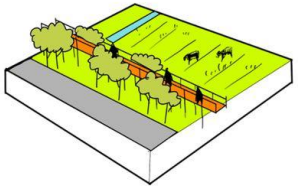
Garden



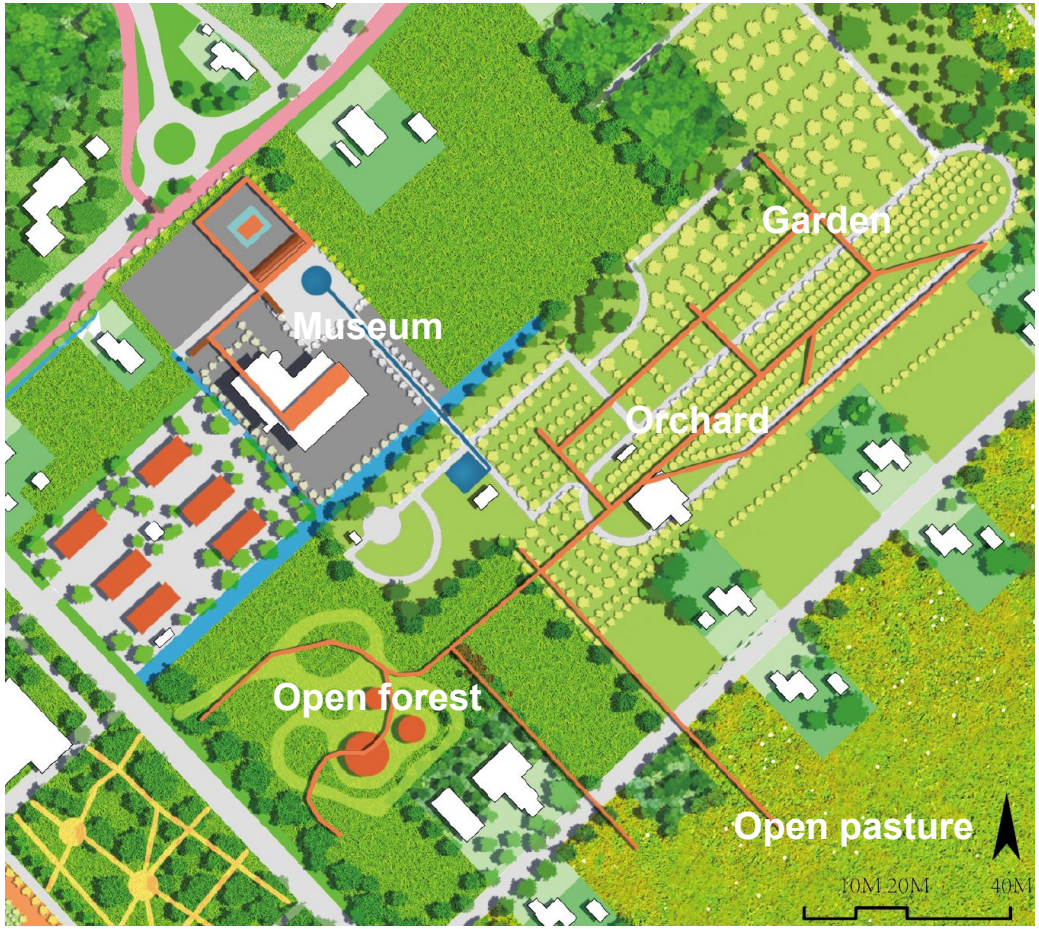
Orchard



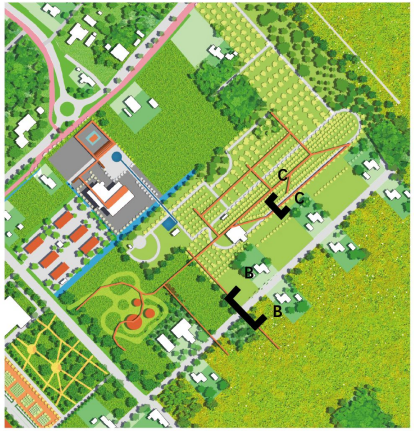
Open pasture



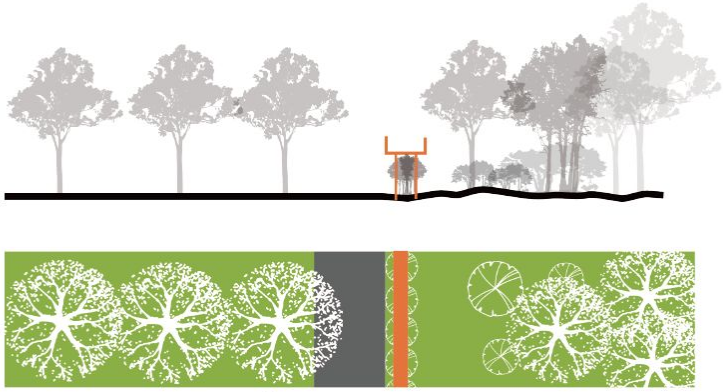
Open forest



Design-heritage strategy

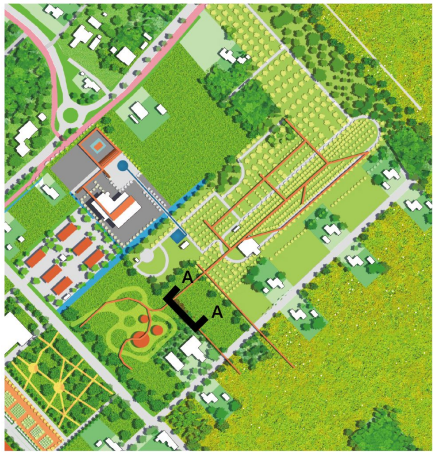


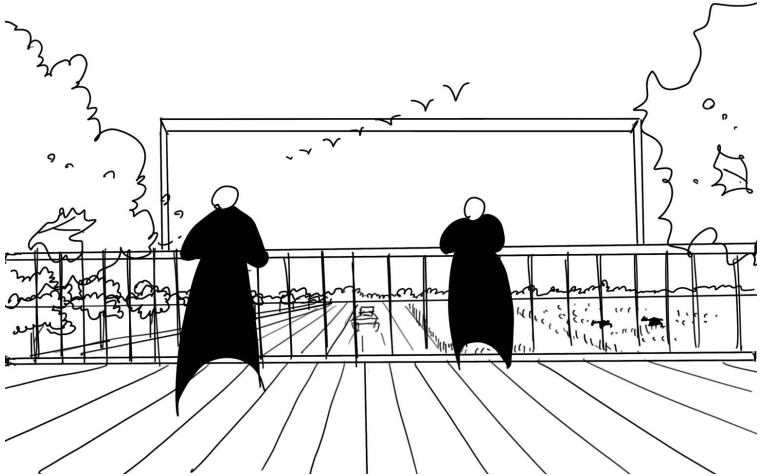
Section B-B 5m



Section C-C 5m

Design-heritage strategy



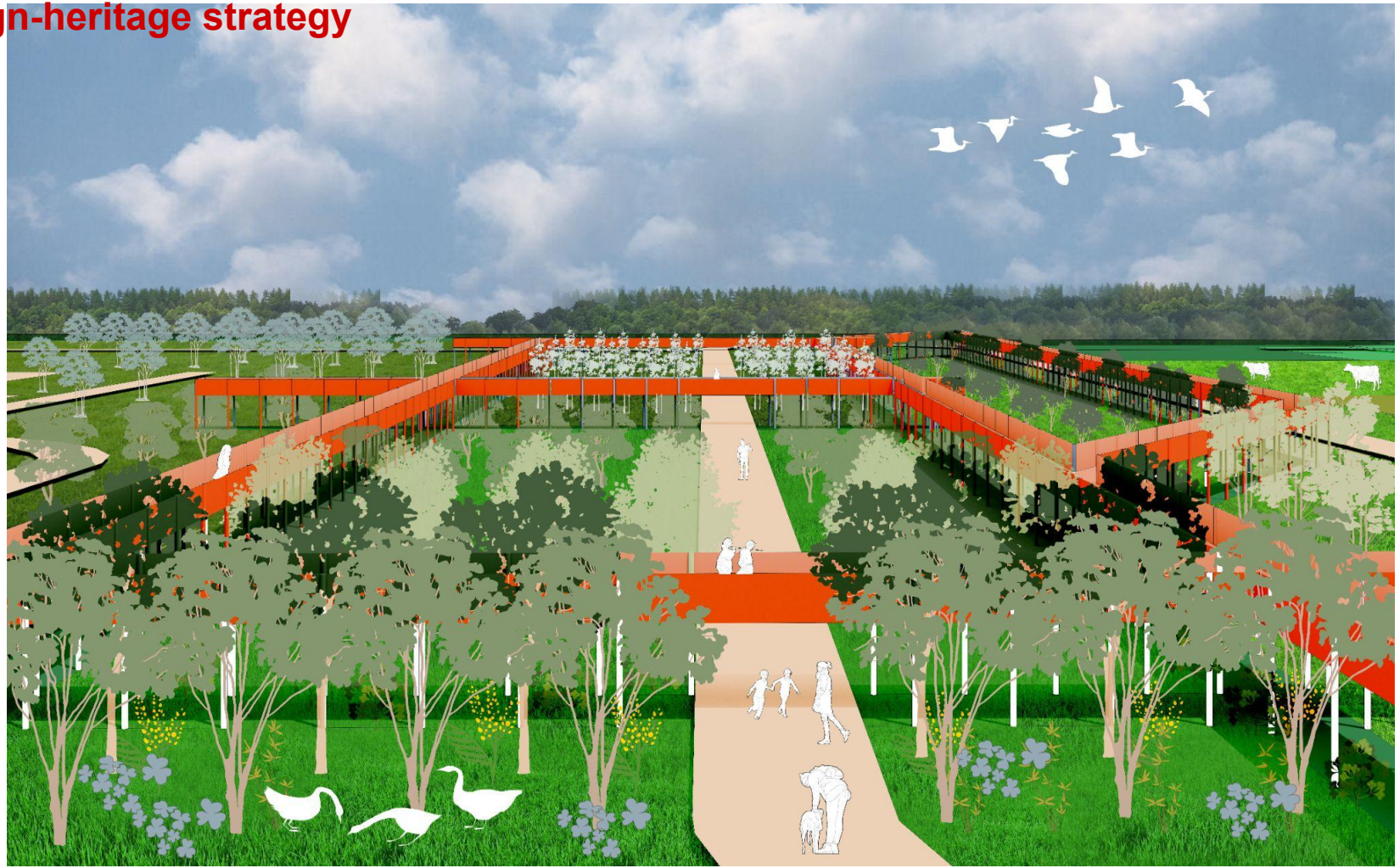


Section A-A

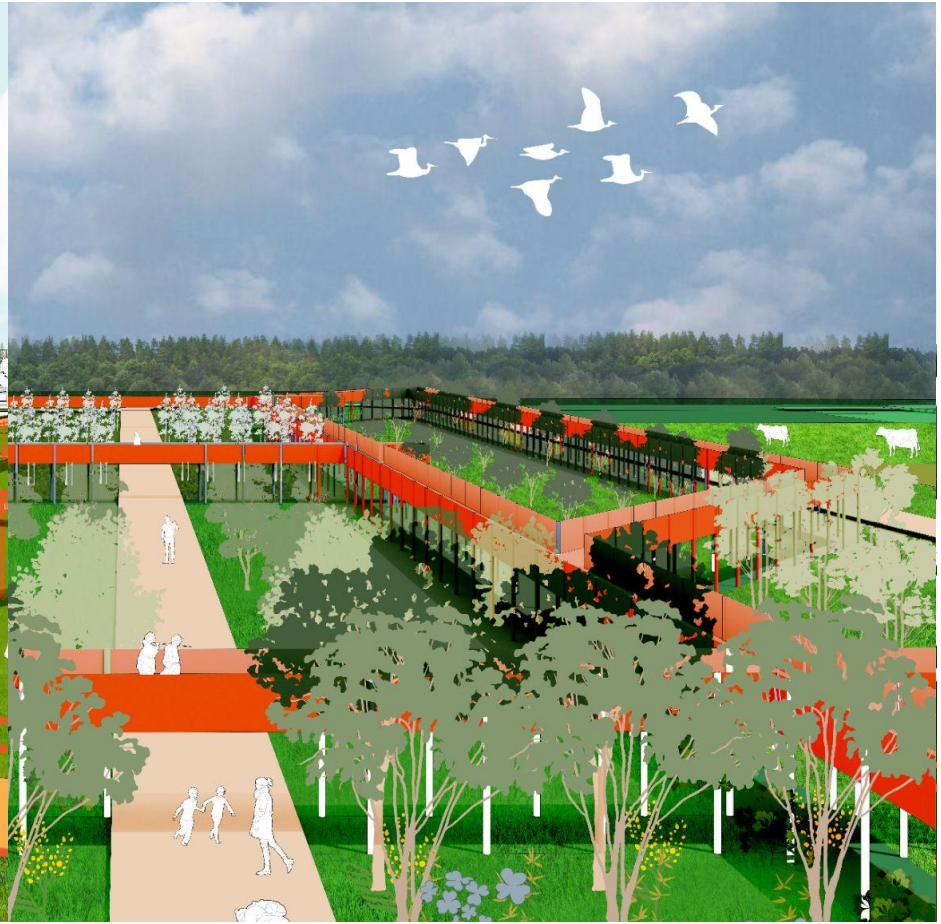
5m

Design-heritage strategy

Design-heritage strategy



Design-heritage strategy



Research question

How to use or transform agricultural and heritage resources in Colonies of Benevolence site to improve the living conditions of local residents?

Thank you！