Integrated Nodal Estate Landscape

Reconnecting Baakse Beek Brook Eco-system & Recreation through Estate Landscape Development

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■ Introduction
  □ Fascination
  □ Problem Statement
  □ Research Objective & Questions

■ Approach

■ Diagnosis
  □ Analysis
  □ Challenges & Opportunities

■ Strategies & Principles

■ Design Exploration

■ Conclusion
INTRODUCTION

- Fascination
- Problem Statement
- Research Objectives & Questions
Healthy condition of a natural brook—defined by unaltered hydrology (streamflow), high diversity of habitat features, and natural water chemistry—supports diverse biological communities with aquatic species that are sensitive to disturbances.
• **Flexible Boundaries between heritage and mankind**

The interaction between people and heritage can be **flexibly adjusted** (inclusive or exclusive) according to specific conditions to achieve a certain balance.

• **Indicative Landscape**

Some landscape with characteristics of specific estate could be arranged on the way there, working as a guidance or indication for people to realize where they are.

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**Estates Balanced Interaction System**

- Experience more about Cultural Heritage
- Better Protection of Historical Heritage
- Get conveniently to each Estate Landscape
- Coherent Experience when travelling among Estate Landscape
Half of lands in Netherlands are **sandy region landscape**, which the brook ecosystem is tightly **connected**.

So to enhance the **brook ecosystem** is to improve the **whole landscape**.
There are also some **recreational values**, including cultural and leisure values, on top of the landscape.

So to enhance the **Recreational System** can help with the landscape.
Amounts of estates have formed in Eastern Netherlands since 16th Century. The estate landscape is a kind of combination of Brook Eco-system and Recreational System.
Historical Development of Baakse Beek Region

13th C: First Mentioned
- Vorden Castle
- De Wiersse
- De Wildenborch
- Huize Ruurlo

15th C: Mostly Rebuilt
17th C: Castle Vorden (After most castles built)
19th C: Huize Ruurlo

Cultural Value
- Started at De Wiersse
- Het Medler (After rebuilt showing the appearance of the 19th's C)
- De Wildenborch

Functional Transformation
- DEFENSE
- TOWN HALL (Ruurlo)
- LIVING
  - CULTURAL EDUCATION
  - RECREATIONAL VISITING

Veengoat appeared
Baakse Beek appeared

Maps and Historical Images:
- 1650 De Wildenborch
- 1743 De Wiersse
- 1800 Castle Vorden
- 1841 Huize Ruurlo
- 1900 Het Medler
- 1949 De Wiersse
- 1929 Huize Ruurlo
- 1950 Castle Vorden
- 2019 Veengoat
- 2019 Baakse Beek

Timeline:
- 1600
- 1743
- 1800
- 1900
- 1949
- 1950
Agriculture grassland took place of the nature areas, especially the forests through time changing.

Changing of Green Structure

There are less marshlands and forests than before.

Changing of Watercourse

Watercourse's getting straighter, wider and more complex. Groundwater level is lower than before.

Problems with Brook Eco-system

- Unhealthy Brook Eco-system

  + Seasonal Water Issues
  + Pollution (Eutrophication)

Design Assignment 1

Prevent surrounding from Flooding & Drought

Design Assignment 2

Purify the Water and Balance the Nutrient for creature around living
There are some roads that existed before as connection among estates and ecology, yet now have been removed because of reasons like economic benefits and defense.

- Poor Recreational Quality
- Insufficient Interaction with some of the Heritage
- Inaccessibility to the Estate Landscape
- Poor Recreational Quality
- Landscape Space Levelling out
- Enhance Spatial Diversity
- Make up New Connection among Heritage
- Strengthen Engagement between human and heritage

Design Assignment 3
Design Assignment 4
Design Assignment 5
Design Assignment 6
Hence, now the relationship between brook eco-system and the recreational system has changed from a close and tight situation to a relatively separated one.

Estate landscape nowadays serves as an important role combining these two systems.
Estates themselves could be connected through Brook Eco-system and Recreational System, while Brook Eco-system and Recreational System could be linked through several estates.
Explore the potential of **estate landscape** as a link to restore the complex **connective relationship** between **brook eco-system** and **recreational system**: Identify spatial design strategy for the development of estate landscape of the Baakse Beek region by enhancing the brook ecosystem and recreational system.
More Interaction

More Gradient

Rich Biodiversity
Integrated Wetlands

Green Connection
Research Questions

✓ What are 2 systems and how do they interrelate to each other?
  
  What are the challenges and opportunities according to analysis?

✓ What kinds of design principles and interventions are available could be set to solve the problem taking advantage of the possibilities?

✓ How to apply through design and what will be the possible results for the Baakse Beek area?
APPROACH
<table>
<thead>
<tr>
<th>Theory</th>
<th>Methods</th>
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<tbody>
<tr>
<td><strong>a) Look Estate Landscape as a system</strong></td>
<td>➢ Decomposing it in layers/systems</td>
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<tr>
<td></td>
<td>➢ Address them on different levels/scales</td>
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<td>➢ Look into time period</td>
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<td><strong>b) Regard Brook System &amp; Estate Landscape as two related units</strong></td>
<td>➢ Interacting them on different layers (Commons, connections, opposites, conflicts…)</td>
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<td>that support each other</td>
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<tr>
<td><strong>c) Consider human beings as continuously working elements, with</strong></td>
<td>➢ Guiding them in order to interact or keep distance with estate</td>
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<td>dynamically changing activity routes</td>
<td>and landscape</td>
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<tr>
<td><strong>b) Use Indicative Landscape as an integrated functional system</strong></td>
<td>➢ Make it as connection and coherence among different elements with</td>
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<td></td>
<td>diverse characteristics</td>
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Brook Eco-system Network Elements & Summary Maps
(Water quantity, water quality, landscape typologies...)

Recreational Landscape Network Elements & Summary Maps
(Mobility network, cultural facility, leisure facility...)

Estate Landscape Elements & Summary Maps
(Layering analysis, systematic heritage...)

Conclusion

Challenges & Opportunities

Conclusion

Potentials
Brook Eco Elements & Summary

Always suffer flooding in winters and drought in summers

Water Quantity

Eutrophication pollution in some parts of the brook

Water Quality

Concluded as 5 main landscape typologies around

Landscape Typologies

Existing habitats (maybe separated) are mostly located in sandy region landscape where many estates are settled around

Ecological Habitat Degradation
Conclusion & Potentials On Brook Eco-system

Restoring Wetlands

Some areas could be changed to green zones such like ineffective farmlands

New Green Zones

Layers of soil typologies and other land use could contribute to potential wetland zones

Restoring Wetlands

Straightened water courses could be re-meandered to help with water issues

Re-naturalization

Potential eco improvement around brook would rich habitats & biodiversity

Redeveloping Habitats
Recreational Elements

Not much mobility flows around this rural region.

Cultural Facility

High historical heritage values

Leisure Zones

Relatively low leisure quality

Could not visit around partly because of the privacy.
Conclusion & Potentials on Recreational System

**Imbalance of Interaction Degree between Human, Estate & Landscape**

- **Exclusive**
  - Het Medler
  - De Wiersse
  - De Wildenborch
- **Inclusive**
  - Castle Vorden
  - Huize Ruurlo
  - De Intense

**Diverse types of interactive landscapes according to specific estate**

**Intervention**

- More inclusive
- A little exclusive

**Ranking of Recreational Quality**

- **Poor Recreational Quality**: Het Medler
- **Good Recreational Quality**: De Wiersse, De Wildenborch
- **High Recreational Quality**: Huize Ruurlo

- **Castle Vorden**
- **De Wildenborch**
- **Het Medler**
- **De Wiersse**
- **Huize Ruurlo**

**Destructive to the heritage**

**Insufficient interaction with culture**

**LEGENDE**
- Accessibility to the Estate
- Eco experiences (green space...)
- Cultural Activities and Values
- Leisure activity
- Accessibility inside the Estate

**Ranking of Recreational Quality**

**Poor Recreational Quality**: Het Medler

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**Intervention**

- More inclusive
- A little exclusive

Diverse types of interactive landscapes according to specific estate
Reconnecting Roads Redeveloping Habitats

There are some roads that existed before as connection among estates or ecology. Some developed to farmlands now.
Layered Elements

Axles & Viewing lines

Composition

De Wildenborch

Blue Typologies

Green Typologies

Cultural Exploration

Leisure Experience

Natural water scene

Hedge around the watercourse

Historical valued estate

Bathed watenscape, fountain

Straight watercourse

Hedge surrounding water

Surrounding functional historical buildings

Kitchen Garden

Pergola

Sports Playground

Green spaces surrounded by recreational & functional areas

Green spaces surrounded by natural area
Crucial Heritage on Brook Eco-system
Crucial Heritage on Recreational System

- Existing Terrain
- Historical Terrain

British Garden

Cultural Values
- Low lying marshland because of the bandit fortress
- Existing Historical Roman pond
It can be seen that estates and farmhouses were mostly built at the edge of sand region, so that people can take advantage of both wetness and drought. Only Het Medler were set in the middle of swamp lands, because of defense. Moreover, buildings, especially the estates, were likely to be built on higher ground. Then the estate connect with surrounding landscapes through green & blue axes and view lines.
These estates link to each other by green and blue structure, infrastructure and visual. Medler, Wiersse and Ruurlo castle can connect one another by water and green links. Yet there are lack of connection between De Wildernborch and the others.
- Brook Eco-system Network Elements & Summary Maps
  (Water quantity, water quality, landscape typologies...)

- Recreational Landscape Network Elements & Summary Maps
  (Mobility network, cultural facility, leisure facility...)

- Estate Landscape Elements & Summary Maps
  (Layering analysis, systematic heritage...)

- Conclusion

- Challenges & Opportunities

- Potentials on Brook Eco-system

- Potentials on Recreational System

- Potentials on the Combined System
TOOLBOX: STRATEGIES & PRINCIPLES

- Case Studies
- Strategies Catalogue
- Principles
Symbiosis of Nature and Infrastructure: Revival of Resilient Canal Network, Ningbo, China.

Canada unveils its first chemical-free public outdoor pool and it's gorgeous

Overlook Farm as an exemplary working landscape

Design Strategies

**LANDSCAPE**
- **Brook Eco-system Modification**
  Ecological Landscape System
  Healthy Blue & Green Infrastructure
  Restoration of Wetlands
  Interaction-balanced System

- **Recreational System Reconstruction**
  Indicative Landscape
  Transitional Landscape
  Interstitial Space

**CULTURE**
- **Estates as Heart of Networks**
  Stronger the Garden Environment
  Make use of Elements of Estates as Hinge/Hub...
  Recall Historical Links

**NETWORKS**
- **Multiple Connection**

**NODES**
- **Sustainable Land use/Landscape**
  For Woodlands: Restoration of Functional Forests, Multiple Plantings...
  For Grasslands: Multiple Grass Seed Configuration...
**Healthier Brook Eco-system**
- About Water Quantity
  a) Multiple Wetlands Restoration
  b) Re-meandering
  c) Restoration of natural infiltration to Groundwater
  d) Increase water storage space in brook
- About Water Quality
  a) Anti-pollution with Landscape and Technical methods
- About Ecological Landscape around brook
  a)

**About Water Quantity**
- About Public Space
  a) Space Restoration

**About Ecological Landscape around brook**
- About Infrastructure
  a) Roads Reconnection

**Higher Recreational Quality**
- About Public Space
- About Infrastructure

**CREATION**
- Healthier Brook Eco-system
  - About Water Quantity
    a) Basins and Ponds
  - About Diverse Landscape
    a) Transitional Landscape
    b) Interaction-balanced System
    c) Interstitial Landscape
  - About Diverse Experience
    a) Multiple Sensory
  - About Cultural Memory

**Higher Recreational Quality**
- About Water Quantity
  a) Basins and Ponds
  b) New Brook Connection

**Healthier Brook Eco-system**
- About Water Quantity
  a) Basins and Ponds
  b) New Brook Connection

- About Diverse Landscape
  a) Transitional Landscape
  b) Interaction-balanced System
  c) Interstitial Landscape

- About Diverse Experience
  a) Multiple Sensory

- About Cultural Memory
Tool Box: Relationship Typologies (In what ways 3 systems could be connected)

Estate landscape as View-focus points
- Height Difference Near the Culture
- Watercourse Connection
- Sensory Connection
- Height Difference
- Planting Diversity

Estate landscape as Interstitial Landscape
- Among Coherent Landscape
- Identification Increase
- Retention Ponds

Estate landscape as Sponge
- Resilient Relationship
- Roads Reconnection
- Re-naturalization and Flooding Plain Zones
Application: Connect through Retention Ponds

Retention Ponds set Typology

Environment
Surrounded by Points Elements
Trees
Cultural Structures
In Middle of Large Open Space
Meadows
Hard paved square
Facets Elements Inside
Patches of water grass
Points Elements Inside
Poles
Platforms
Stepping Stones
Surrounded by Banded Elements
Brook

Revetment
Naturalized Water Bed
Vertical Revetment
Stepped Revetment
Masonry Revetment

Recreational Set Typology
Cultural Attraction
Memorable Structures/Landmarks
Public Space
Platforms
Interactive Activity Zones
Sports Center
Educational Garden
Continuous Pavement
Interactive Activity Zones
Stepping Stones on Natural Area

Combination Typology
Ways to combine 3 systems
Ways to set up restoration ponds
DESIGN EXPLORATION

- Possibilities
- Experiments
Possibilities

**OPTION1**: Activate functions of *groove forestry* to get integrated

- Renewed Groove Forestry
- Roads Reconnection
- Watercourse Connection
- Flooding Plain Zones
- Retention Ponds
- Re-naturalization
- Water Reconnection

**OPTION2**: Activate functions of *watercourse extension* to get integrated

- Watercourse Connection
- Renewed Groove Forestry
- Roads Reconnection
OPTION 1 (GROOVE FORESTRY RESTORATION)

- Application
- Comparison & conclusion
- Reflection

- 2 Systems as Links (Local proposal)
- Each Estate as Link (Estate development)
Layering/Decomposing & Integration

**Layering**

- Layer 1: Water
- Layer 1: Ecology
- Layer 1: Recreation
- Enhanced Estate Landscape
- Integrated Nodes 1
- Integrated Nodes 2
- Integrated Nodes 3

**Systemic Decomposing**

- System 1: Brook Eco-system
- System 2: Recreational System
- Enhanced Estate Landscape
- Integrated Nodes 1
- Integrated Nodes 2
- Integrated Nodes 3

Diagram showing the relationships between various layers and systems, with integrated nodes indicating points of connection.
Story of De Wiersse...

Historic Entrance Area
Entrance Area Nowadays
Goals on layers

Watering all year round:
• More Water Diversion & Habitats

Diverse Landscape Experience:
• More Habitats and biodiversity
• Visual Experience

Emphasize the Genius Loci orderly:
• Recall historical memory
Watering All Year Round

People want less water when flooding

Then drought occurs in summer with flooding in winter

They added drainage grooves

Restore part of the historical brook. Increase the diversion and habitats
Resilient 'Battery' System

Watering All Year Round

Normal

Rain a bit

Flooding

Drought
Battery 1
Create more Gradience nearby the Brook
Battery 1
Create more Gradience nearby the Brook
Battery 2
Existing Lowland to Flexible Retention

Aquifer
Covering Layer
Planting Soil Layer
Sand Layer
Gravel Layer
Overflow Pipe
Perforated tube
Water Resilient Wetland
Brook
Flowing Moat River
Estate De Wiersse

IMPROVED RECREATIONAL AREA
IMPROVED ECO HABITATS
Diverse Landscape Experience

ECOLOGICAL NETWORK... Eco Heritage

Layers Around 1900

Existing Layers

Future Layers

- Restore the historical woodlands near brook to grove forests connecting the estate and the brook

- Restore the historical grasslands near the estate to create open-eye viewing

- People changed many greenlands to farmlands for more economic benefit

- Restore the historical swampland to floating meadows and floating forests
ECOLOGICAL NETWORK - Systemic Links

Diverse Landscape Experience

Existing Grassland System

Existing Woodland System
ECOLOGICAL NETWORK – Systemic Links

Diverse Landscape Experience

Predicted Grassland System

Predicted Woodland System
Diverse Landscape Experience

Historical Swampland to Floating Woodland
Diverse Landscape Experience

Restored Groove Forests nearby the brook
Diverse Landscape Experience

Viewing Experience

UPPER GREENING INTERVENTION
Creating Viewing Lines

Sunken Garden

Viewing Paradise
Leisure Island  Brook  Floating Meadow  New Grove Forests  Kitchen Garden

Kitchen Garden
Emphasize the Genius Loci

Some historical roads could be restored to strength the genius loci.
RECREATIONAL NETWORK Systemic Links
Emphasize the Genius Loci

Existing Recreational System
RECREATIONAL NETWORK - Systemic Links

Emphasize the Genius Loci

Predicted Recreational System

Restored Historical Road

Nodes connecting 3 systems

Visiting Routine
Emphasize the Genius Loci

Follow the Building-up Sequence to tell the History

Areas:
- Entrance Zone
- Grove Woodland Park
- Marshland Leisure Zone
- Formal Rose Garden
- Woodland Vista
- Viewing Island
Layers Composing

Enhanced Layers

Integrated Nodes
De Wiersse's Future
Reflection of De Wiersse

- **Predicted Benefits:**
  1. Relatively comprehensive consideration in each layer
  2. Tight bonds of heritage and systemic links in each layer

- **Deficiency:**
  1. More details in each level, so the unity is insufficient
  2. Difficult to see the correlation and interaction among different layers

- **To improve:**
  Need more comprehensive thinking to build up strong relationships among different decompositions from the estate landscape
Story of De Wildenborch

Historic Estate Zone

Estate Zone Nowadays
Systemically proposals

De Wildenbarch

Nature Reserve Area cannot be get into

Inclusive

Restaurants

Exclusive

Recreation

Efficiency

Existing Degree | Predicted Adding Degree

Brook Eco

Recreation
Refer to the ground water.

The shorter pillars indicate the gradual decline of groundwater.
Integrated Nodes

- Habitats for more Species
- Water Storage
- Green Connection
- Water Purification
- Height difference emotion
- Landscape accessibility
- Cultural heritage experience
- Special period shelter
De Wildenborch's Future
Story of Het Medler

**Historic Way to the Estate**

**Way to the Estate Nowadays**
Reflection of De Wildenborch & Het Medler

- **Predicted Benefits:**
  1. Clearly see relationships between two systems
  2. Clearly see strong connections among systems making use of the heritage

- **Deficiency:**
  1. Lack of the interaction of several elements inside
  2. Difficult to see the role played of working factors

- **To improve:** Need further thinking to see how the elements serve for each system
Estates Development

De Wiersse

De Wildenborch

Het Medler

As a watershed

As a link

As a buffer

Key Role of Restored Groove Forestry

Main Integrated Nodes Estate Development
Comparison

Restored Groove Forests near the estate as links to connect the brook and the estate landscape.

De Wildenborch

Lowland

Natural Forestry

A bit far from the Brook

De Wiersse

Grassland

Higher ground

Crossed by the Brook

Grassland + Woodland

New Groove Forests inside the estate landscape

Het Medier

Near the Brook

Near the Estate

High ground
Other suitable areas that could be adapted with this set of principles
Lessons Learned

Groove Forest Restoration Application

- **Predicted Benefits:**
  1. Water-layer interventions: Alleviate seasonal water problems
  2. Eco-layer interventions: Increase habitats and biodiversity
  3. Recreational-layer interventions: Recall cultural memories
  4. Re-interrelate Brook Ecosystem, Recreational System and Estate Landscape System

- **Deficiency:**
  1. Only applicable to relatively Lowland
  2. Limited ability to collect water and depends to some extent on technical support

- **To improve:**
  Need more application of:
Lessons Learned

Design Methods

Tested

Suggested

1.

2.

Combine to

- Estate Landscape
- System 1: Brook Eco-system
- Layering
- Integrated Nodes
- Enhanced Estate Landscape

as the design process
OTHER POSSIBILITIES
FINAL CONCLUSION

- Strategy Suggestion
- Regional Planning
Regional Development Strategy Suggestion

The most suitable options of some specific zones in the region