

# Forest landscape restoration for climate-adaptive estates in the Baakse Beek region, Gelderland

P5 presentation

28/08/2020

Graduation studio  
'flowscape'

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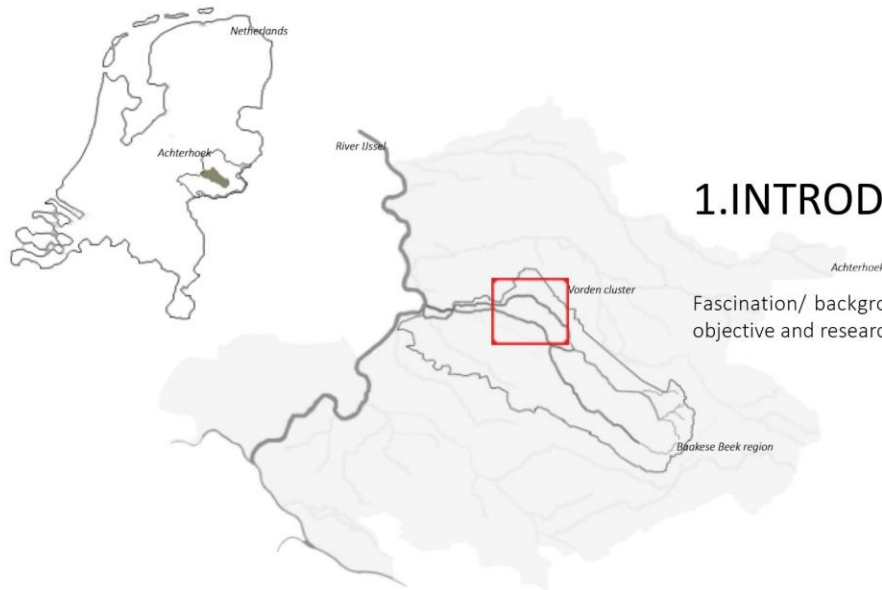
Forest landscape restoration/ strategies and principles

## 4. design exploration

Vision/ intervention on 3 lenses/ 2 estates as cases  
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## 1.INTRODUCTION

Fascination/ background/ problem statement/ research objective and research questions

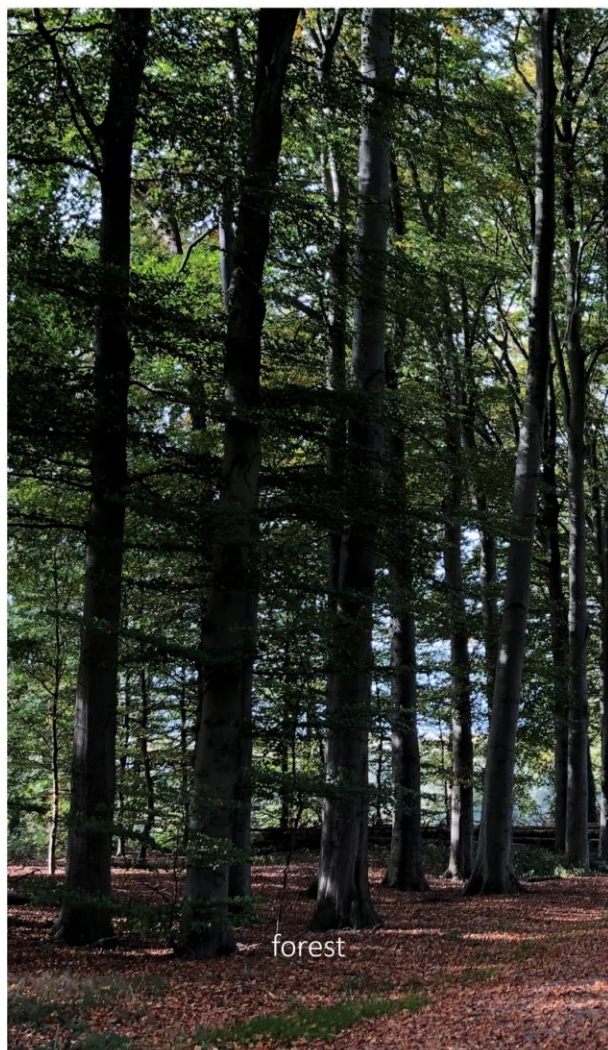
## Fascination

- Different historical developments may have occurred within one and the same "landscape", some of which may have escaped attention.

*Groenewoudt, B. J. (2012). Versatile land, high versus Low: diverging developments in the Eastern Netherlands. In Proceedings of the Latvian Academy of Sciences (pp. 54-69).*









# Background

| landscape development





# Background

## | landscape development



Pre- industrial traditional landscape



Landscapes of the revolutions age



Post-modern new landscapes



## Background

| landscape development



Pre- industrial traditional landscape

Landscapes of the revolutions age

Post-modern new landscapes



## Background

| landscape development



Pre- industrial traditional landscape



Landscapes of the revolutions age

### Post-modern new landscapes

# Background

## | landscape development



Pre- industrial traditional landscape



Landscapes of the revolutions age



Post-modern new landscapes



# Background

## | landscape development



Pre- industrial traditional landscape



Landscapes of the revolutions age



Post-modern new landscapes





CURRENT

This aerial photograph shows a landscape with various agricultural fields and a wooded area. A dashed white line runs horizontally across the middle of the image, separating the 'CURRENT' area above from the 'BEFORE' area below. In the 'CURRENT' area, there is a small, light-colored rectangular structure on a patch of bare ground. The 'BEFORE' area is densely wooded with green trees. The background features rolling hills and more agricultural fields under a clear sky.

BEFORE





## How's the historical estate landscape going nowadays?

Apart from historical deforestation introduced previously,

**what's still doing impacts on the current and future landscape?**



## Methodology

literature study /  
field study /  
mapping /

**design research**

case study

**research by design**



## How's the historical estate landscape going nowadays?

Apart from historical deforestation introduced previously,

what's still doing impacts on the current and future landscape?

### theoretical knowledge

- + landscape anamnesis
- + landscape as a structure
- + landscape as a process

### potential of FLR in the study area

- + FLR strategies and principles application
- + generating visions across scales

### study area's situation

- + Baakse Beek
- landscape development
- culture heritage
- climate change



## 2. DIAGNOSIS

Understanding the landscape of Vorden cluster/  
challenges and opportunities



## Understanding the estate landscape





Current estate landscape

enclosed forest

insufficient water

canalized stream





semiopen forest

If everything goes normally...



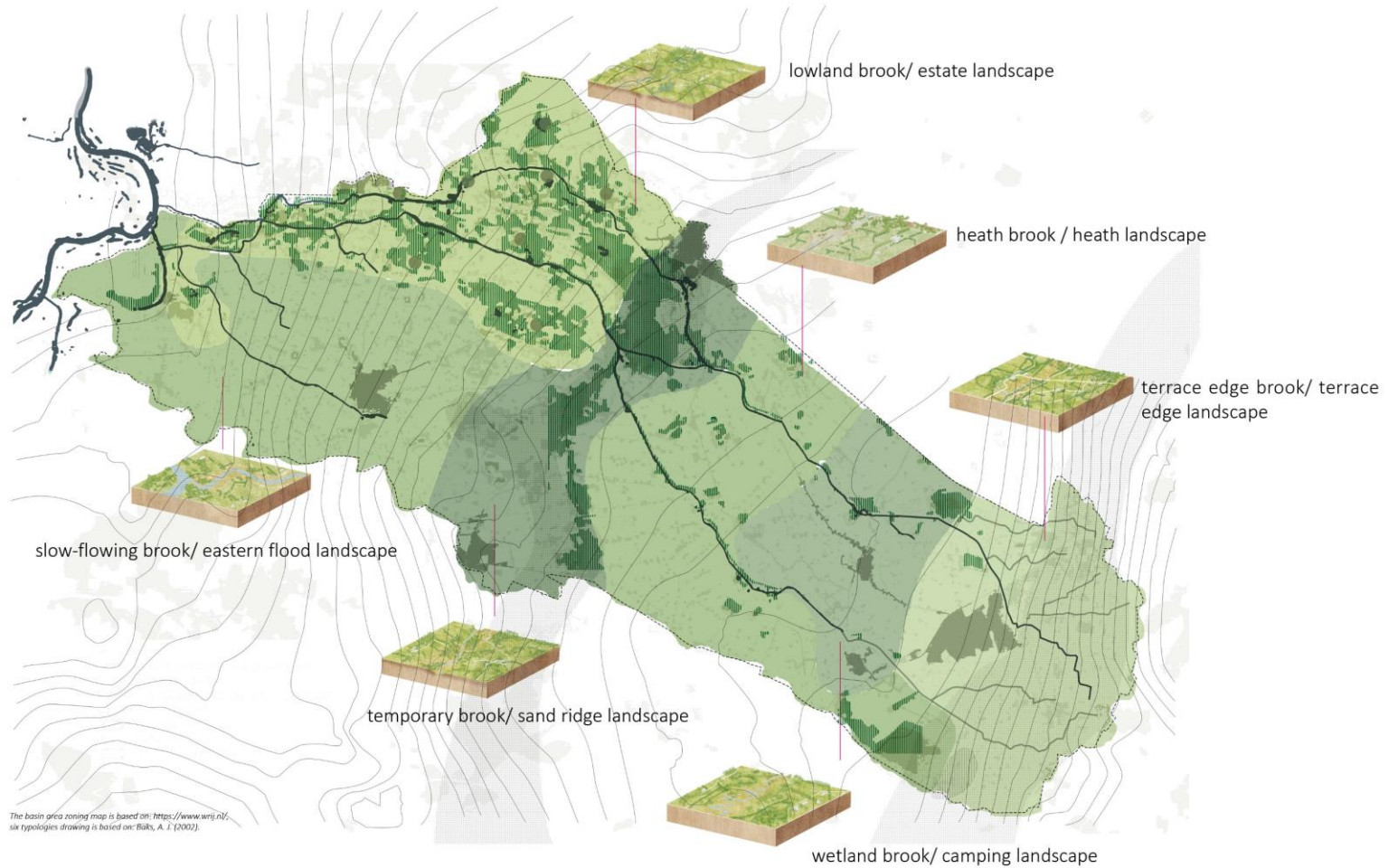
organic watercourse  
with clean&sufficient water

Hydrology environment / Climate change



## | Landscape characteristics

### 6 landscape typologies in the basin area

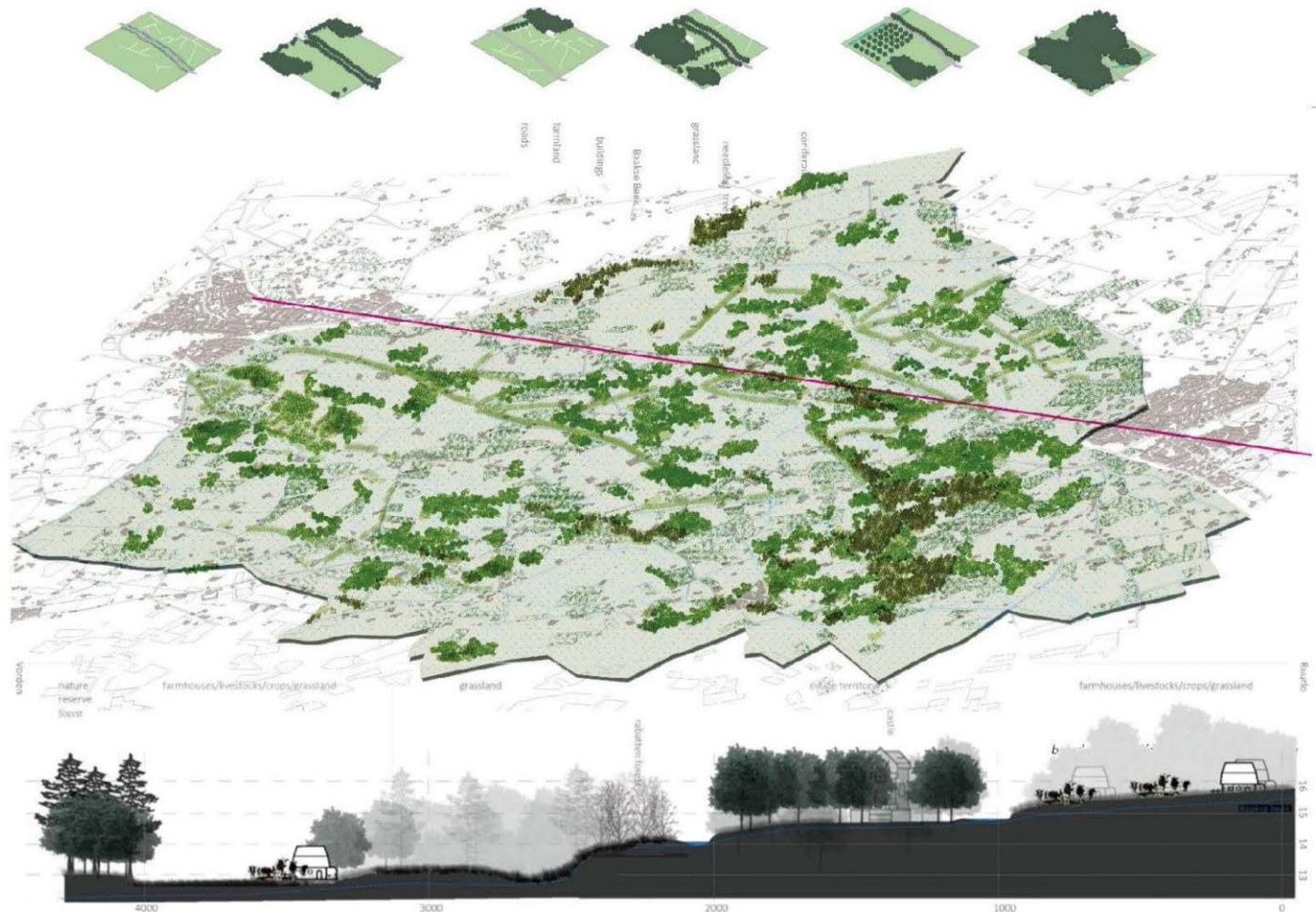




## | Landscape characteristics

Current landscape quality in estate zone

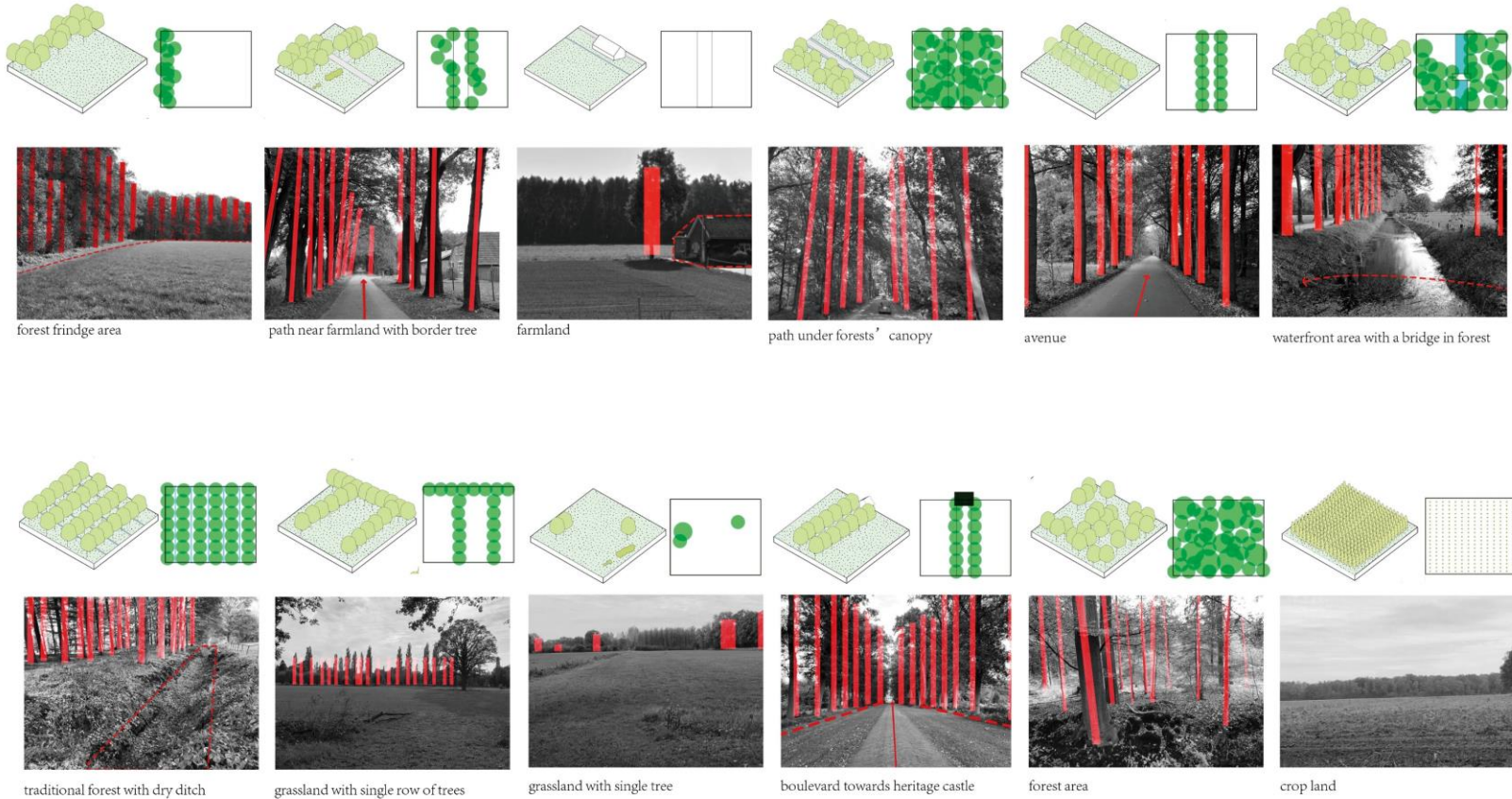
A large majority of the land now is occupied with **grassland and crops land with open view**.



## | Landscape characteristics

### Spatial experience

A large majority of the view is still occupied with **grassland and crops land with open view**.





## | Landscape characteristics

### Forest in estate landscape

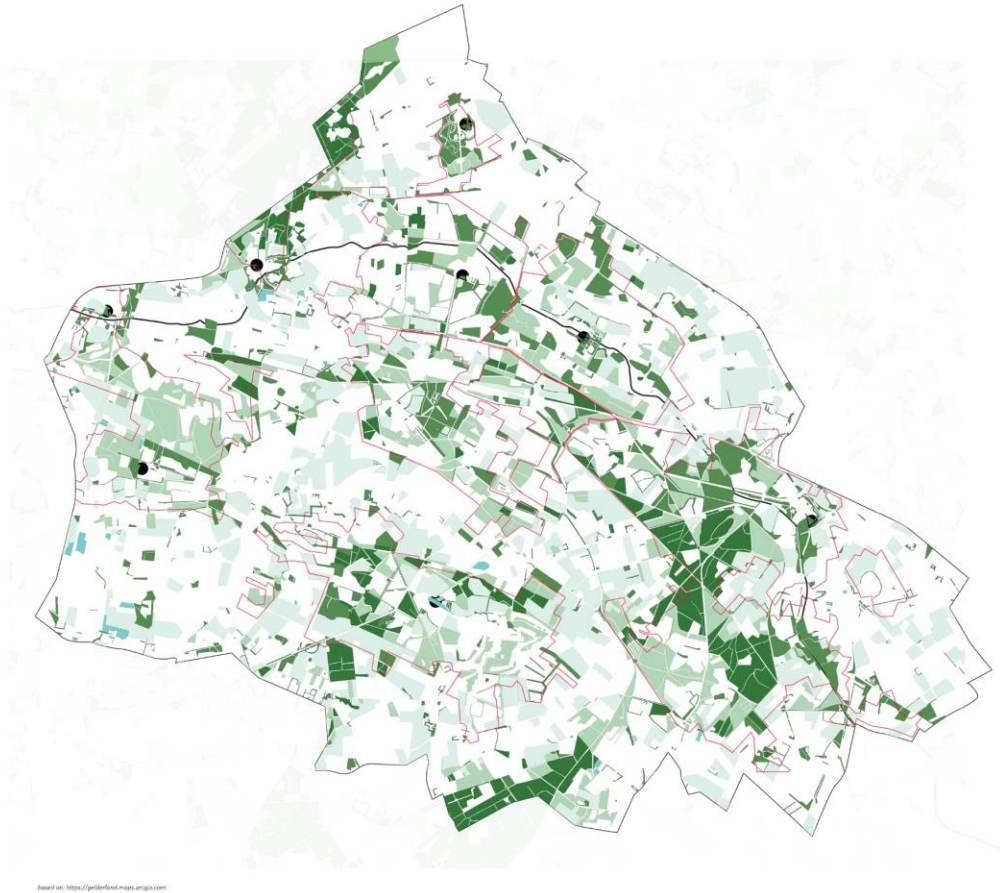
- forest development



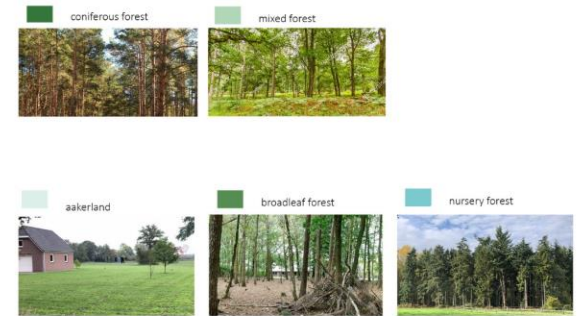
**Forests** as the main role of nature network are **fragmented**, after **deforestation** during these years.

## | Landscape characteristics

### Forest in estate landscape



### - current forest types



The few existing forests, most of them, **mainly** consisting of **coniferous trees**, are imposed to **produce** wood materials and non-wooden productions.



# | Landscape characteristics

## Forest communities and landscape typologies

how the relations originally should be

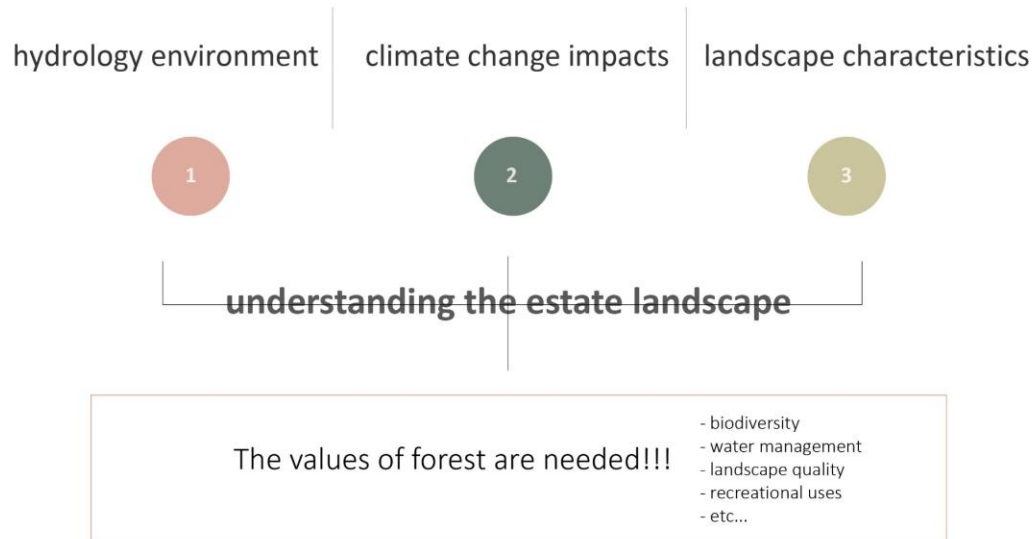


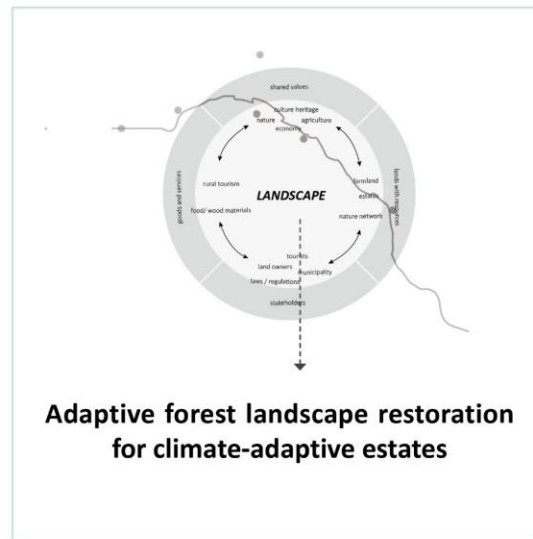
## Challenges and opportunities

1. Historical and contemporary intervention make **the hydrology environment** in estate zone **vulnerable**. Now it's a dry habitat with *insufficient and eutrophic water, as well as barren sandy soil*.
2. **Climate change** brings **more vulnerability** to the environment. *Negative impacts from ecology, water management, agriculture and landscape quality make the landscape typology changed.*
3. The estate landscape lacks ***the connection to the landscape's geomorphological basis, which is the identity of the landscape***, after deforestation and monofunctional forest planning. Problems from aspects of *accessibility, cultural-historical landscape experience, negotiations among stakeholders and restoring the identical landscape connection* need to be addressed.



## Challenges and opportunities





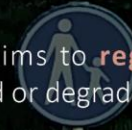
### 3. STRATEGIES & PRINCIPLES



## "Adaptive" Forest Landscape Restoration in the context of estate landscape

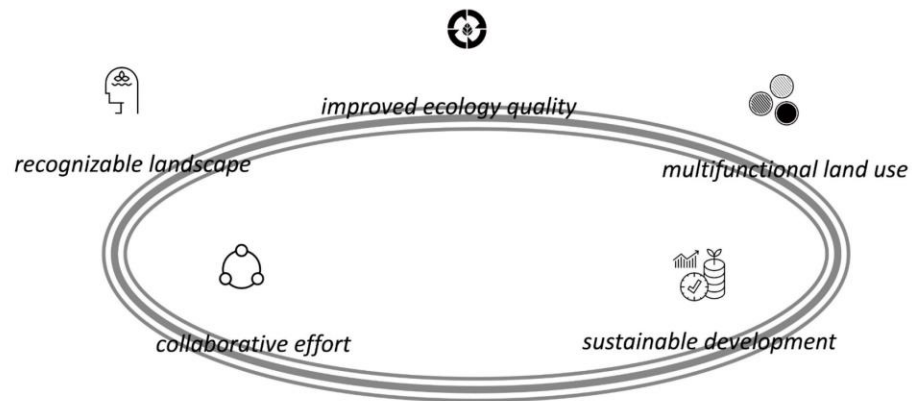
Forest landscape restoration (FLR) is a process that aims to **regain ecological functionality** and **enhance human well-being** in deforested or degraded landscapes.

Here, in the context of estate landscape, FLR aims to enhance the hydrological environment, combat climate change and strengthen the landscape characteristics.





## 5 adaptive FLR principles



5 main FLR-related principles concluded and supported from **the landscape of the Baakse Beek region**, **literature research** and **case study** are proposed above, which can be applied to the further design to achieve the proposed goal of the thesis.





## Principle 1: improving ecological quality

### eco-friendly farming practices



manure recycle



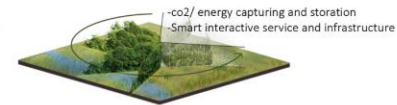
species composition and mowing regimes control

### reforestation



- climate-smart management of landscape elements
- mixed forest

### afforestation

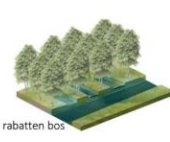


- co2/ energy capturing and storage
- Smart interactive service and infrastructure

transformation and expansion of nature area  
-from natural grassland to forest  
-forest construction on arable land



reconstructing former brook



rabatten bos



mixed forest park



forest meadow



hedgerows fringed forest



## Principle 2: recognizable landscape



implantation and interpretation of  
the old and lost elements



new structures for  
enhanced landscape quality



constructing view point



elevated pathway



education spot



appropriate design of roads  
and stream crossings

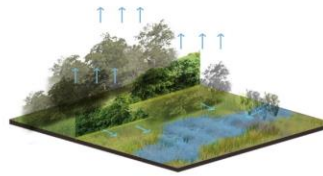




## Principle 3: multifunctional use



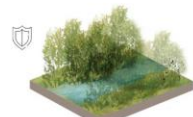
- agroforestry



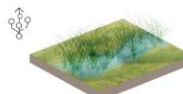
- water management



- recreational and leisure



forest riparian buffer



helophyte filters



forest garden





With these useful and promising strategies and principles in hands,  
**what are the possibilities for estate landscape ?**





## 4. DESIGN EXPLORATION

Regional strategy and strategic components/ intervention  
on 3 lenses/ 2 estates as cases for testing at the local scale

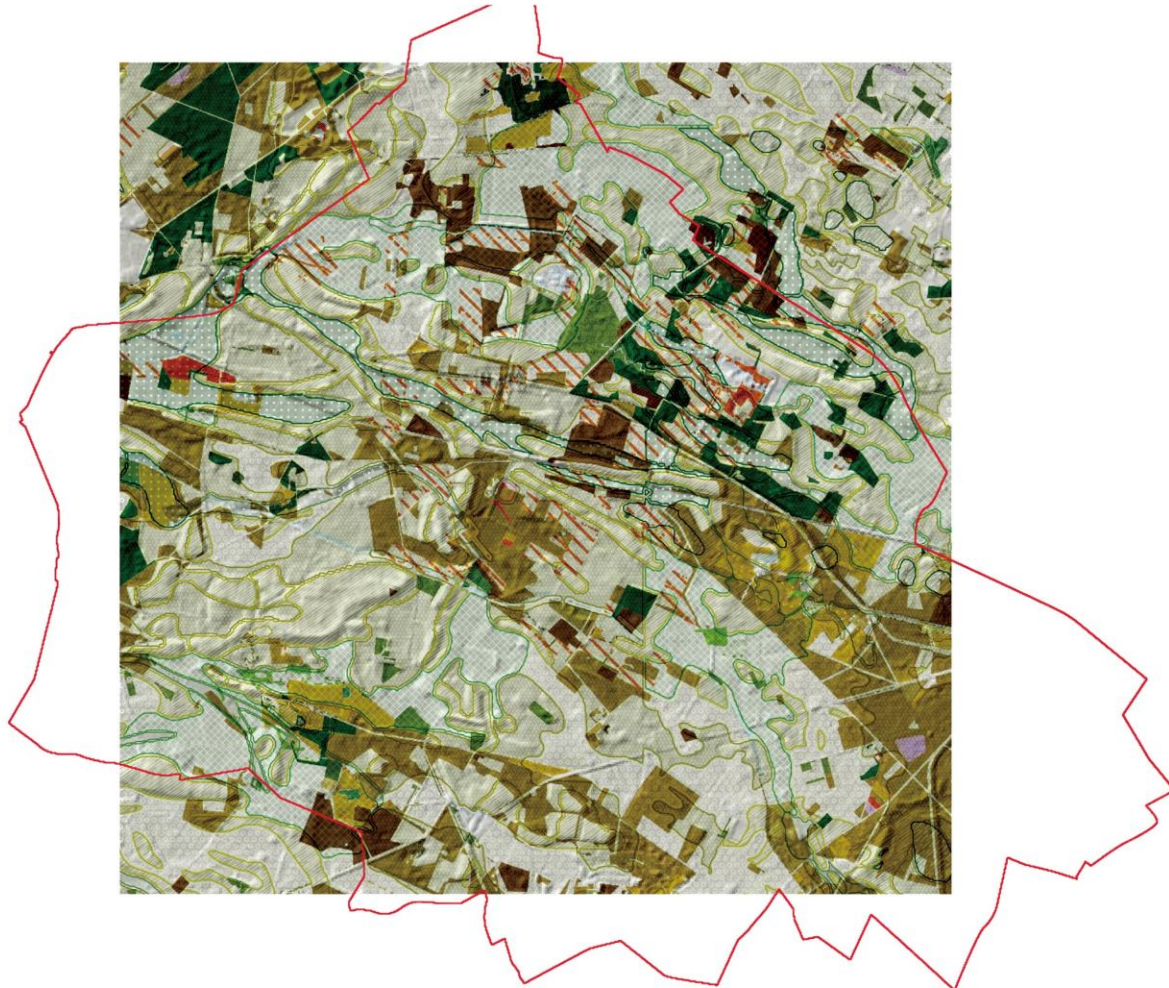
## Regional strategy



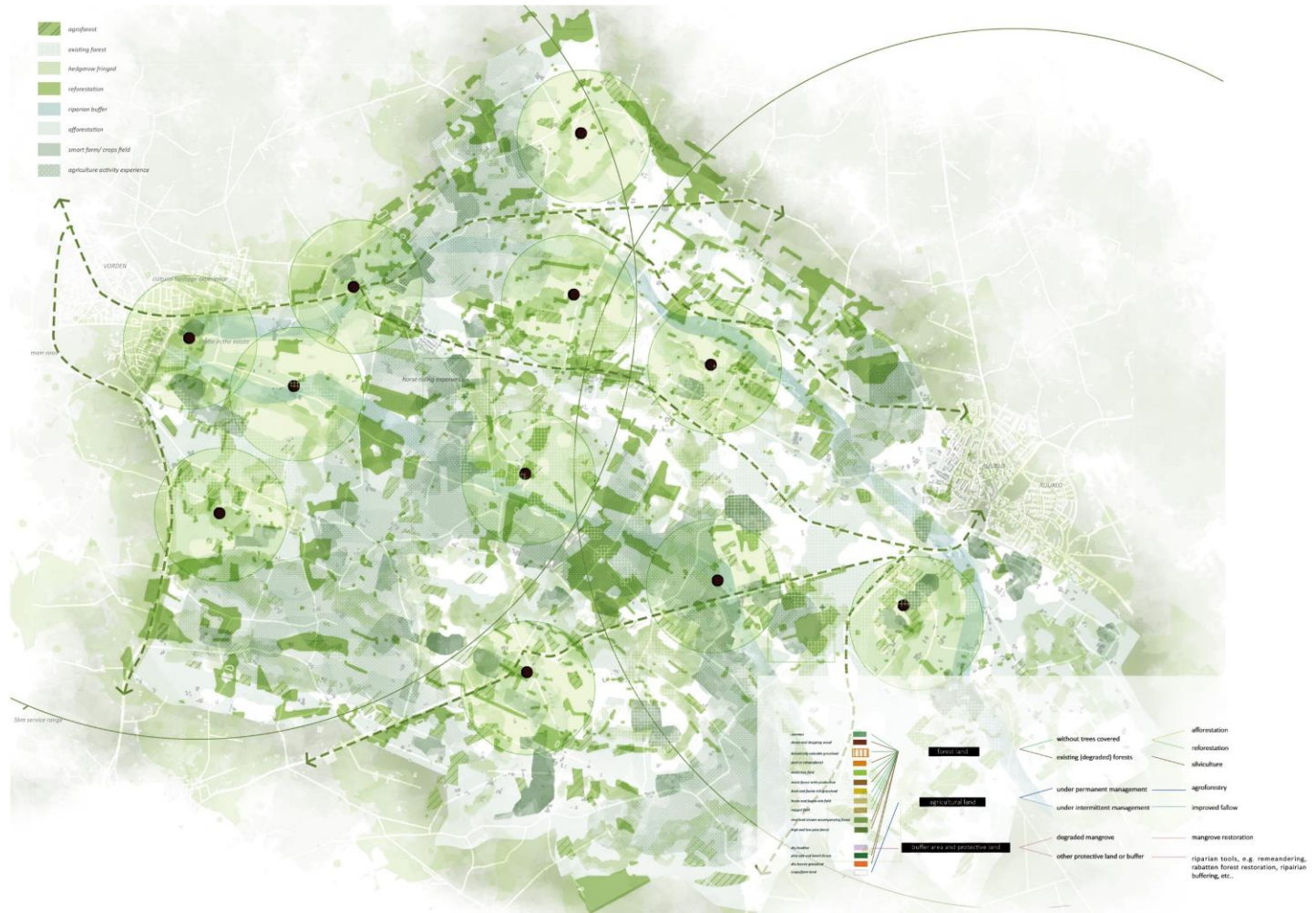


## Regional strategy

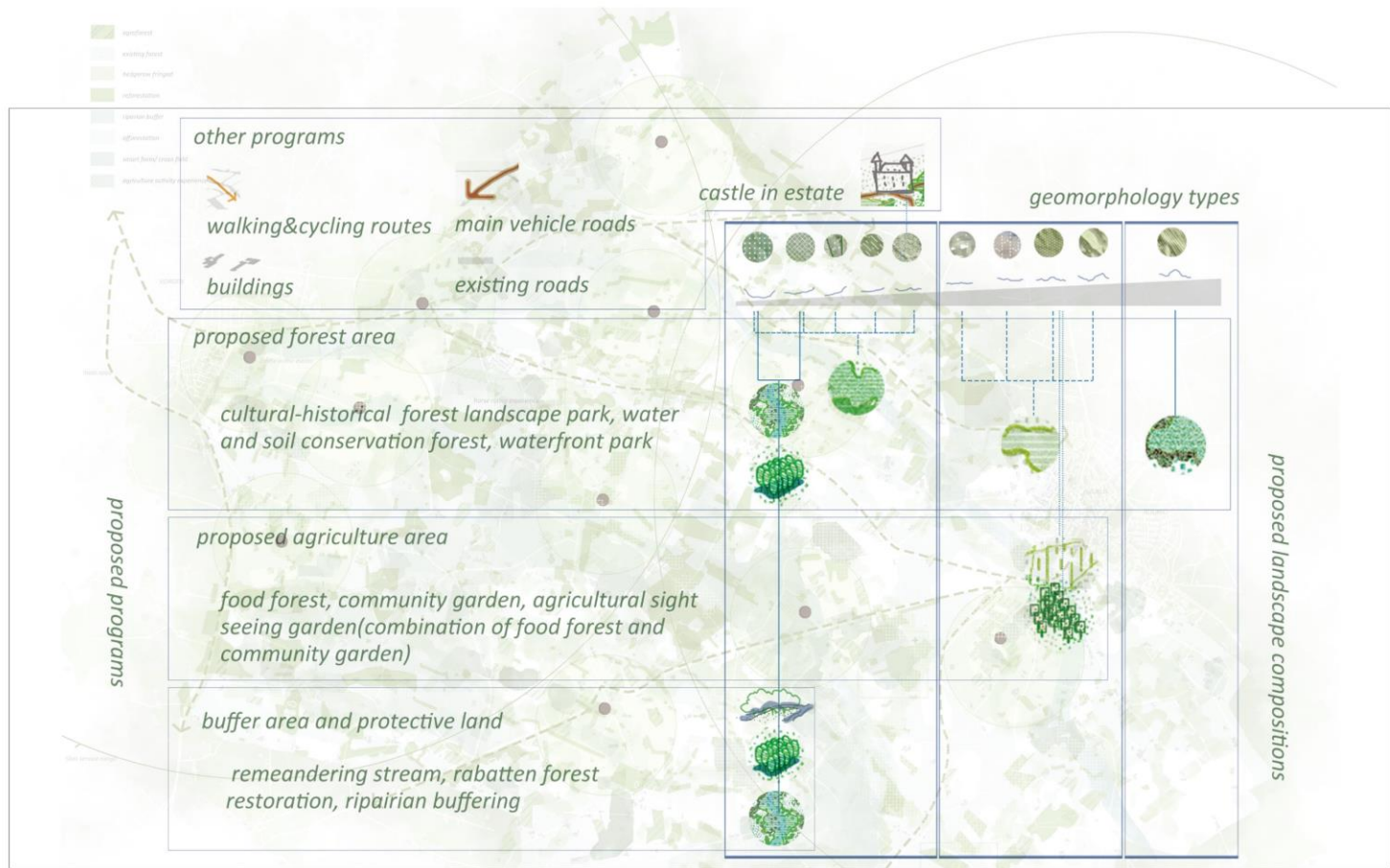
Current situation



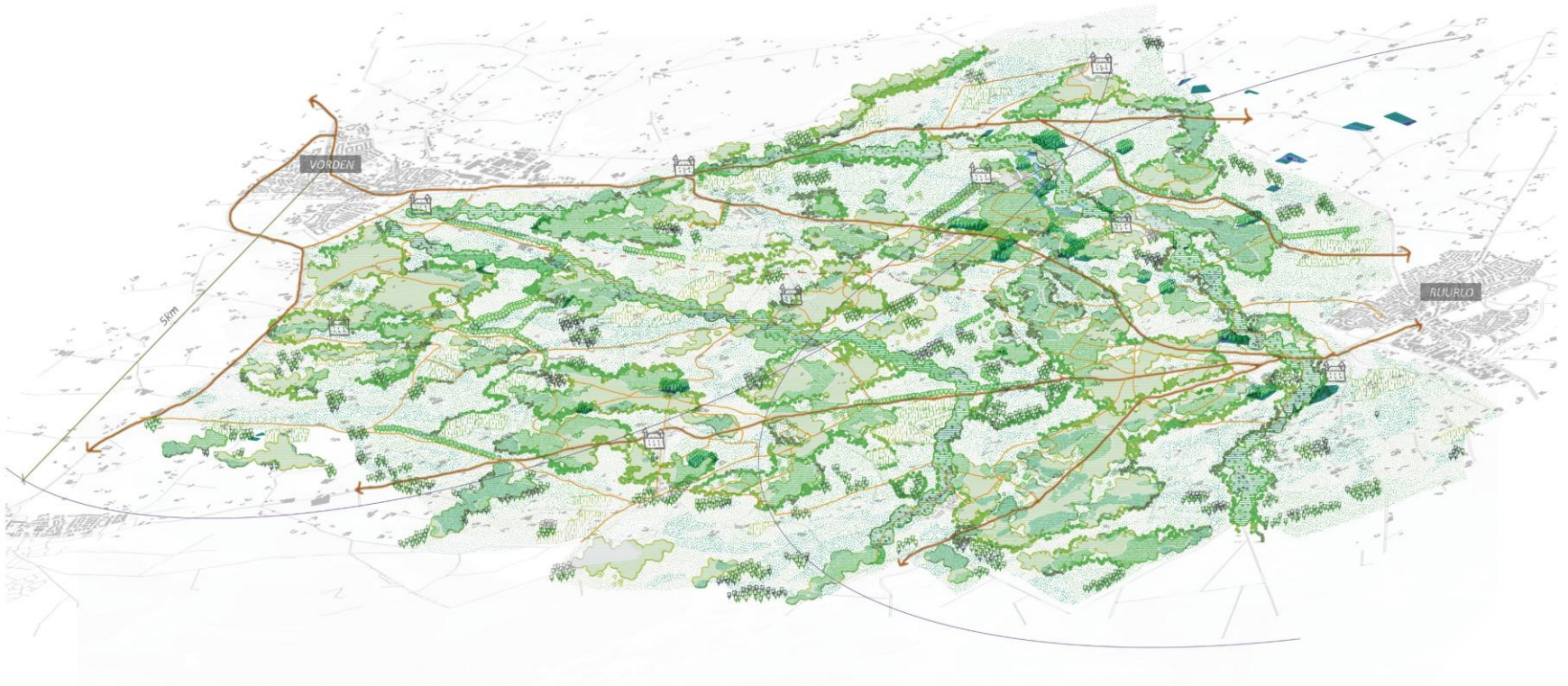
## Regional strategy







| How FLR strategies take effects on the estate landscape and improving its spatial quality?



Strategic components in the context of estate landscape



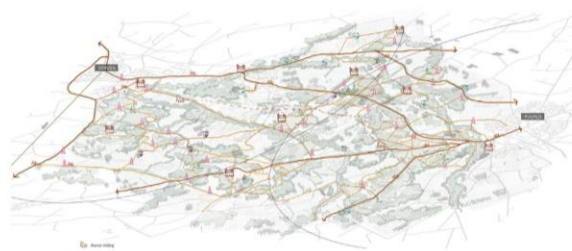


## Intervention on 3 lenses

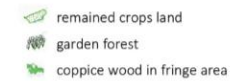
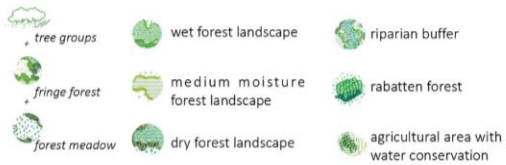
+ ecology



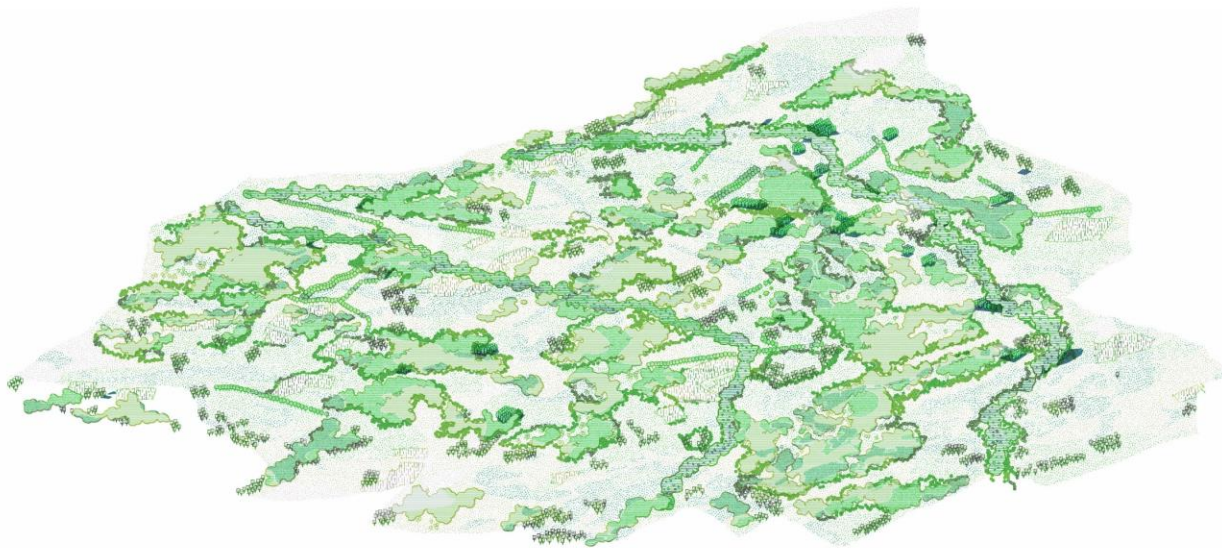
+ recognizable landscape



+ agriculture

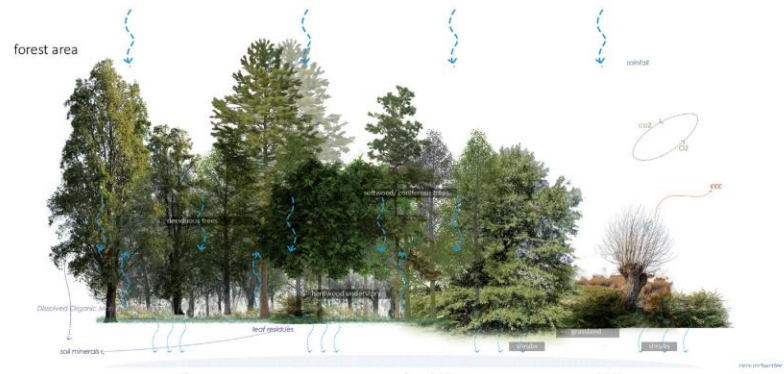


| How FLR can enhance the **ecological condition** in the estate landscape?





- Planting trees based on  
vegetations' ecological  
adaptability:  
from dry to wet



dry/ moderate dry



beech-oak forest



birch-oak forest



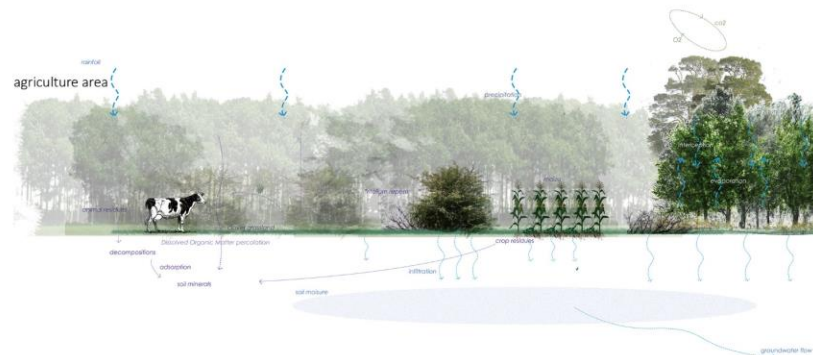
wet



alder-ash forest



swampy alder grove



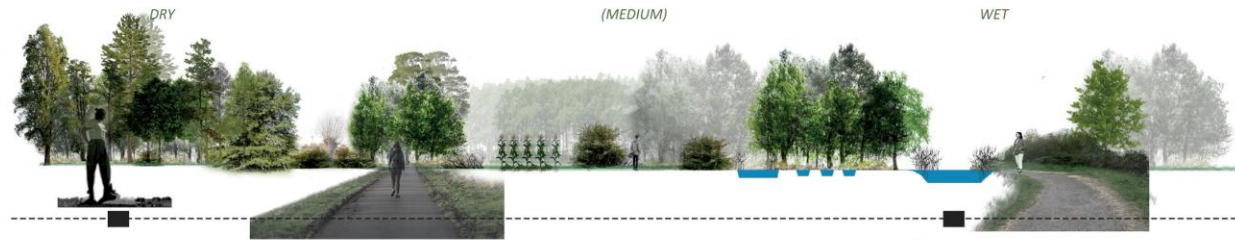
moderate dry



birch-oak forest

enhance the biodiversity  
water and soil  
conservation  
increase the sponge  
capabilities

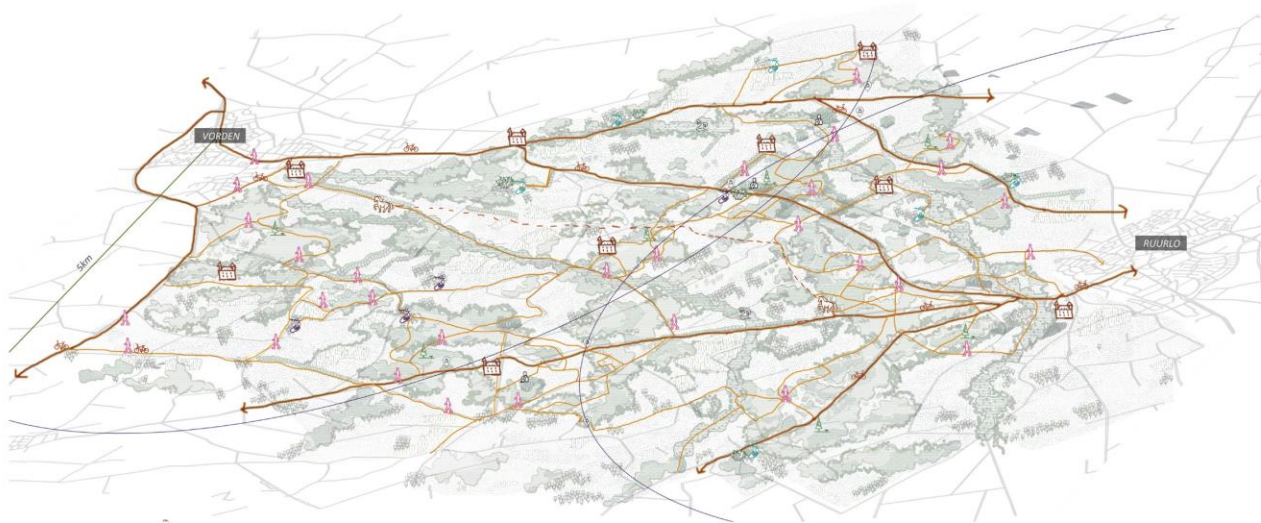
- From dry to wet / *ecological gradient*





| How the FLR can promote **landscape characteristics and experience** in the cluster?

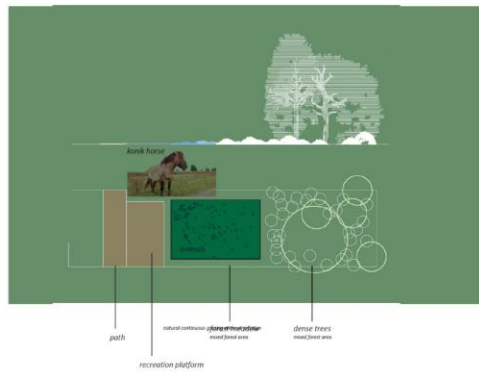
- |   |  |
|---|--|
|  horse riding                    |  cultural- historical forest landscape park |
|  agricultural sightseeing garden |  historical attraction                      |
|  education                       |  rural restaurant                           |
|  walking                         |  waterfront leisure park                    |
|  biking                          |  resting point                              |
|  horse riding route              |  main vehicle roads                         |
|  walking & cycling routes        |  existing roads                             |



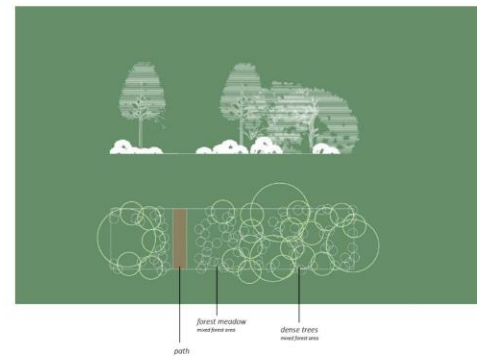
- From the present to the past/ *Remind people of the historical landscape*

" restore  
historical forest types "

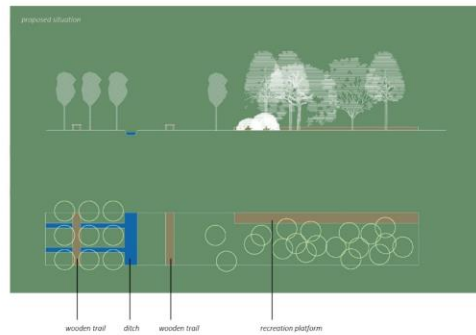
Forest meadow in  
open area



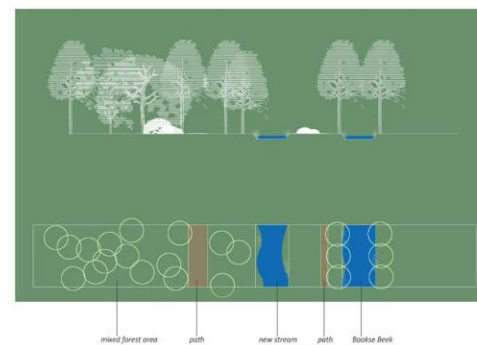
Forest meadow in forest  
park area



Rabatten  
bos

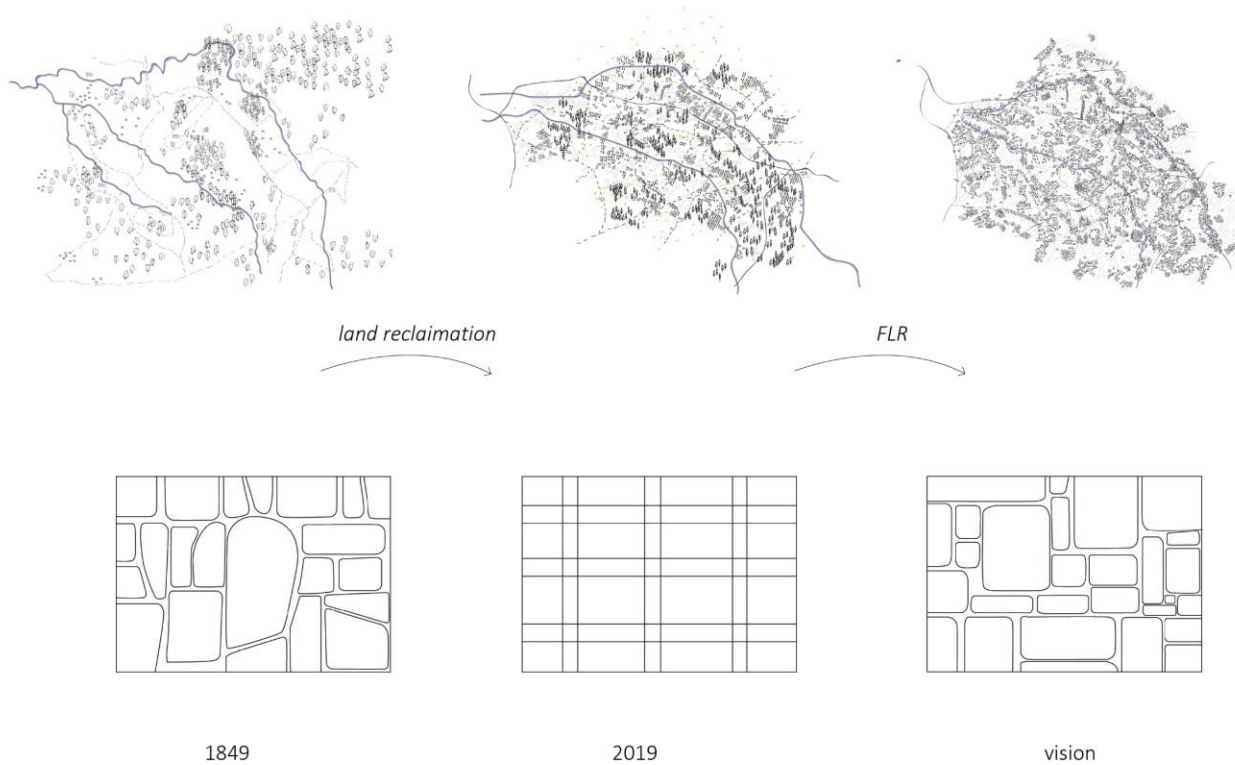


Green buffer of the stream  
remeandering



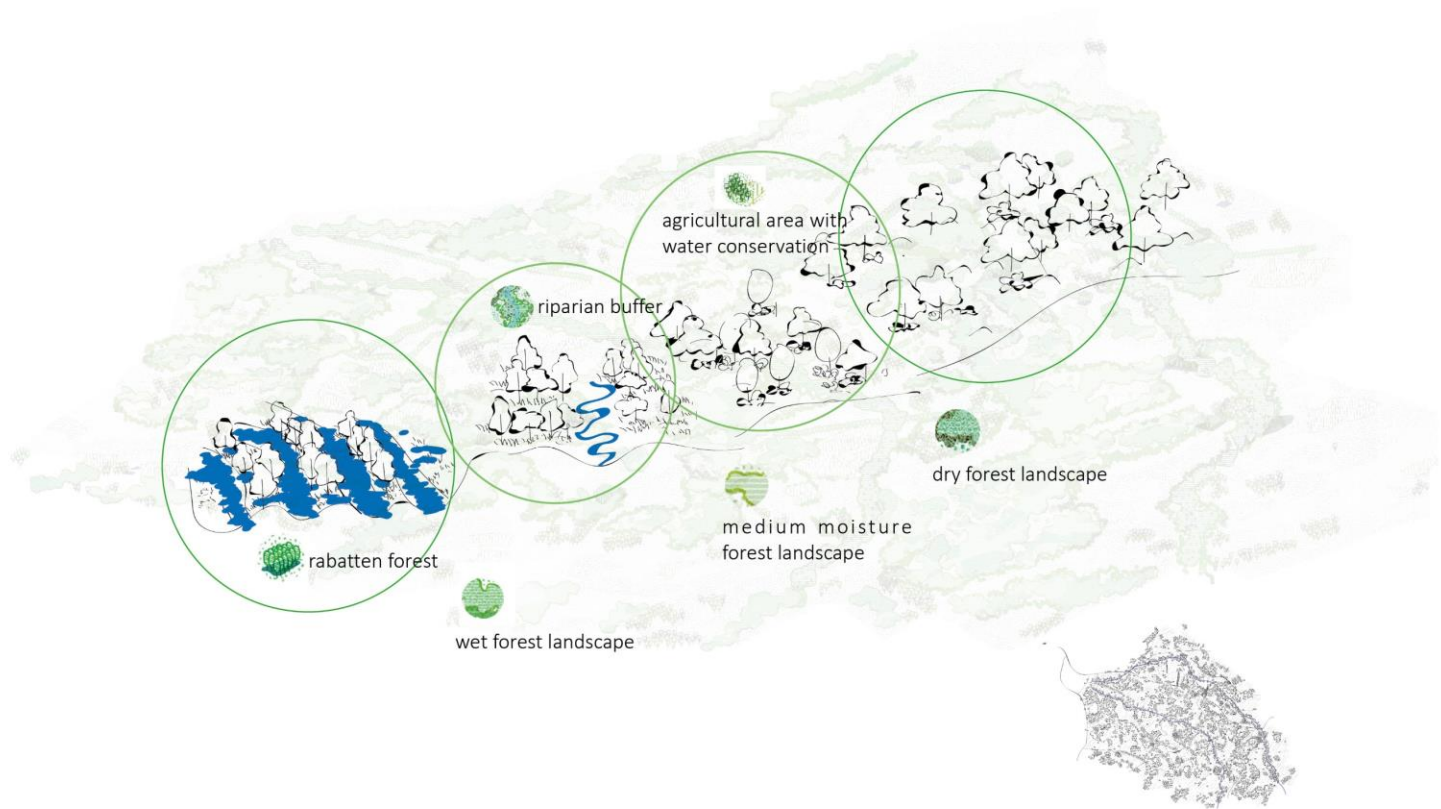


- Successive phases of landscape pattern



" restore the spatial pattern "

“ restore the relation between  
forest landscape typologies and  
estate landscape experience ”



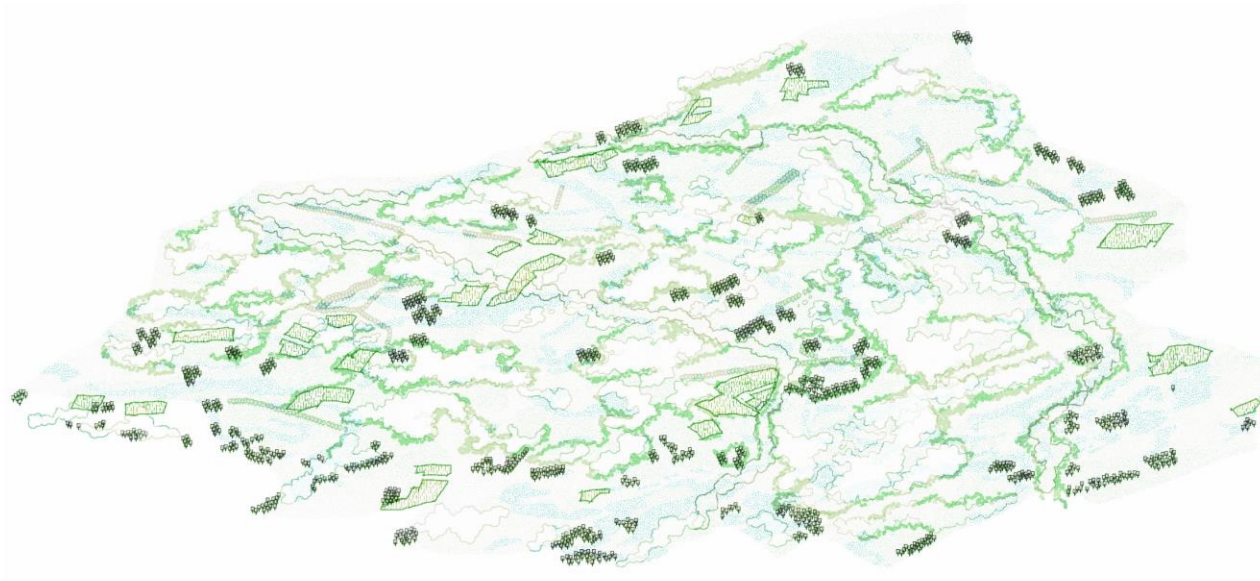


- From the present to the past/ *Recreational gradient*



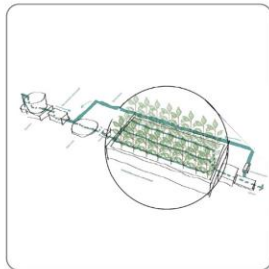
| How the FLR can improve existing **agriculture conditions** in the cluster?

- remained crops land
- garden forest
- coppice wood in fringe area

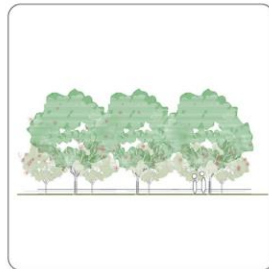




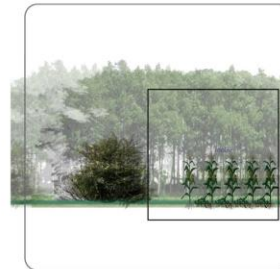
- Agroforestry



recirculating vertical flow  
constructed wetland



food forest planting



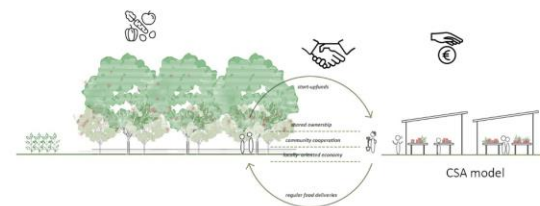
smart management and  
monitoring



planting and harvesting  
in fringe area



planting calendar in  
agricultural garden



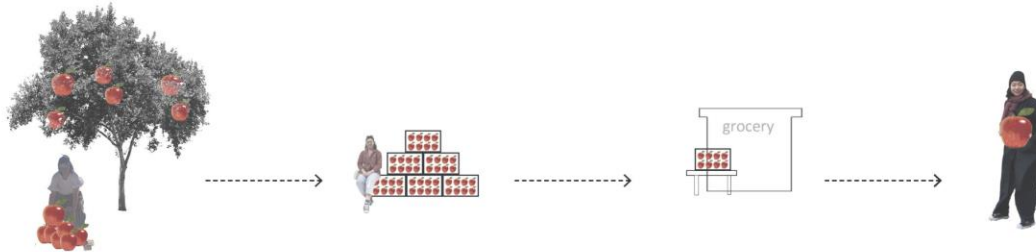
CSA model to market

" remain and promote  
agriculture producing "

- From producing to interacting / *multifunctional gradient*

" improve efficiency/ adding fun/ making profits"

Current situation



Proposed situation





- From producing to interacting / *multifunctional gradient*

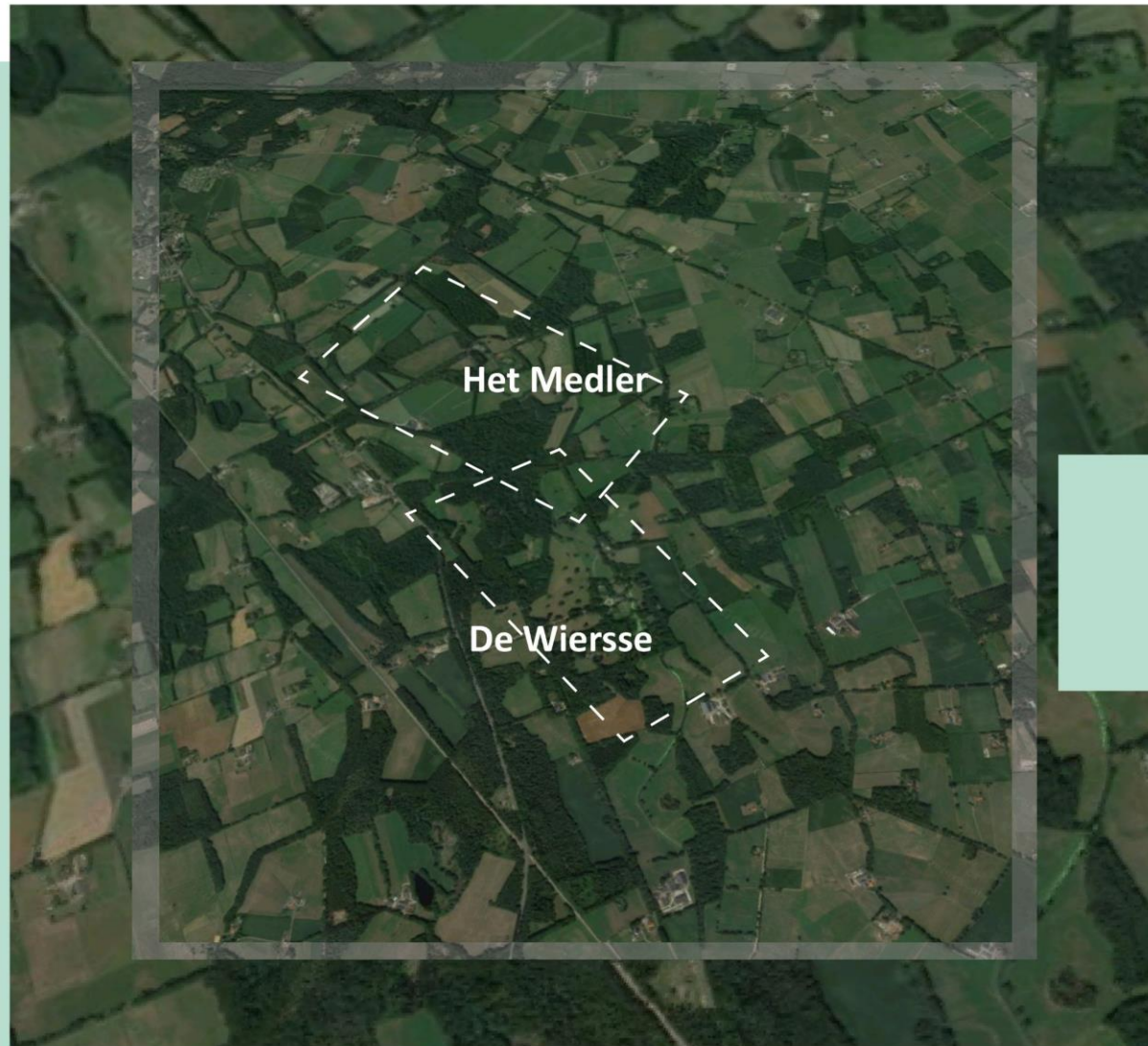




A photograph of a garden featuring a rustic wooden trellis structure on the left, heavily laden with climbing plants and yellow flowers. The garden is filled with a variety of plants, including purple and pink flowers, green foliage, and tall grasses. A well-maintained green lawn is visible in the foreground on the right. The background shows more trees and a clear sky.

What are the potentials for FLR in the estate landscape at the local scale?

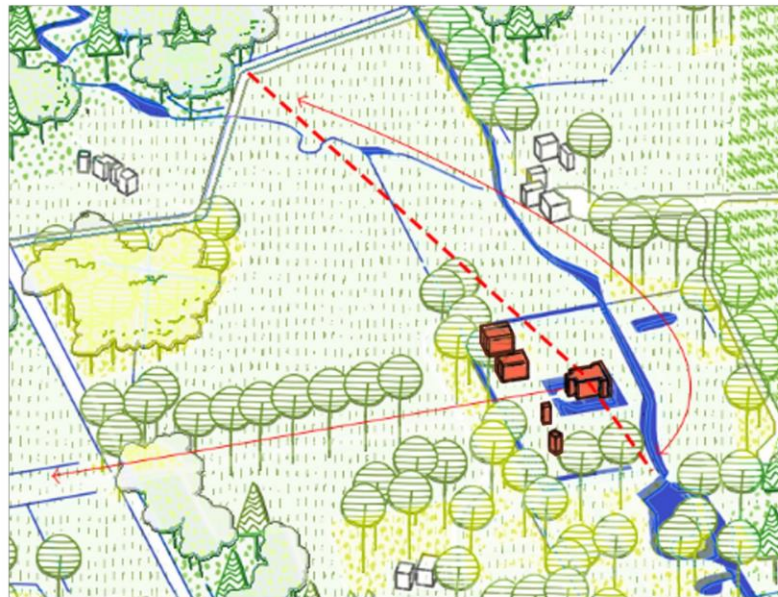
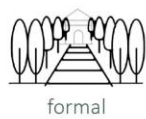




2 estates as cases for  
testing at the local scale

## De Wiersse

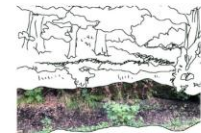
### Characters:



### Challenges:



lacking accessibility



insufficient water



eutrophication



## Design process

Current situation



Current situation + Interventions



Main FLR interventions



silviculture



afforestation



agroforestry

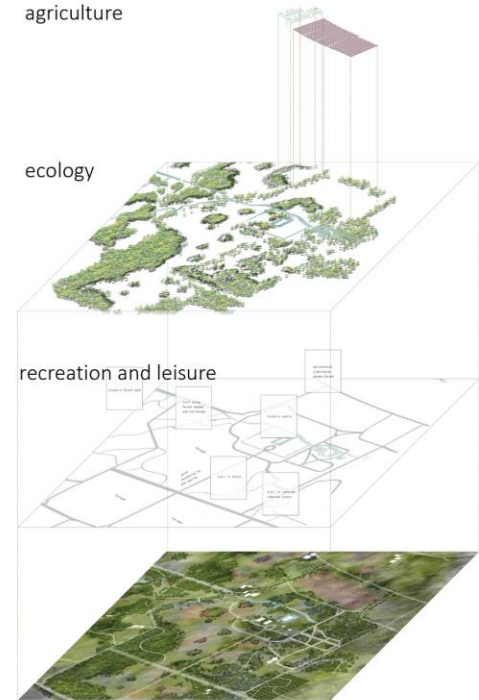
## Design exploration in De Wiersse



agriculture

ecology

recreation and leisure

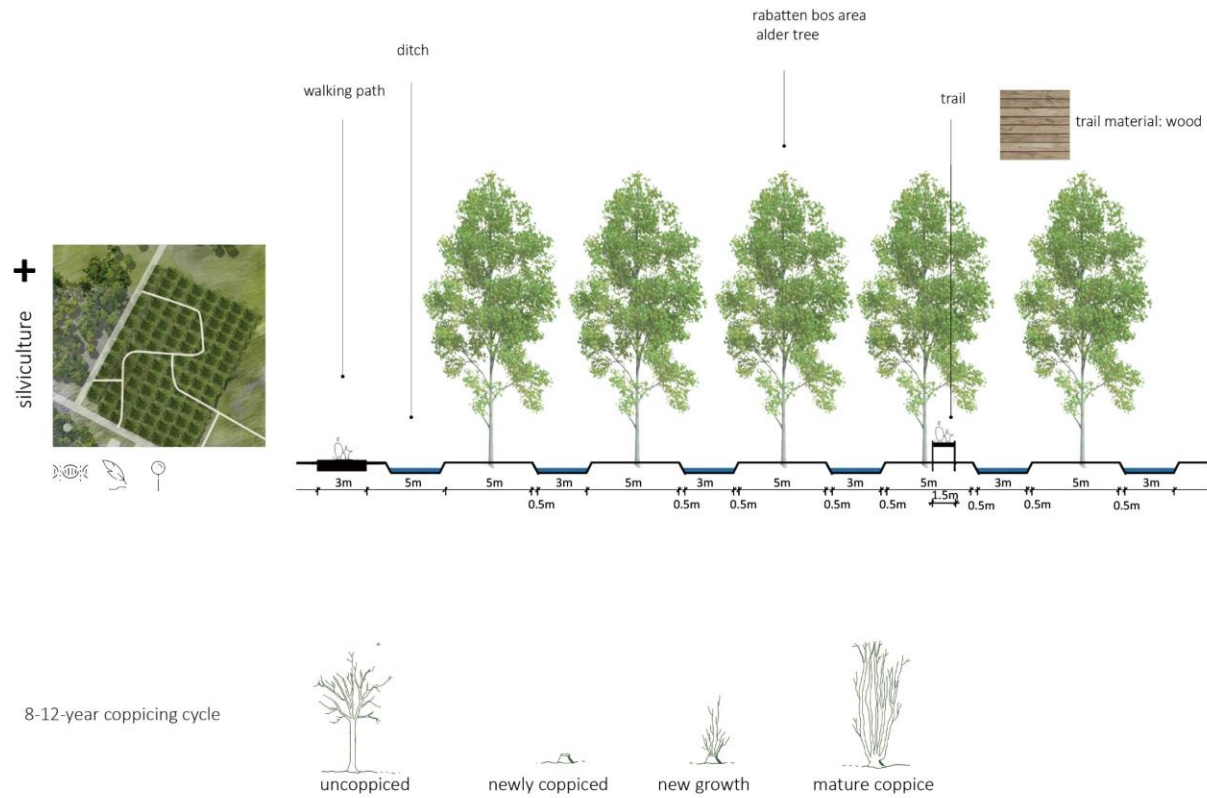




| Experiencing sequence



## i. Rabatten bos





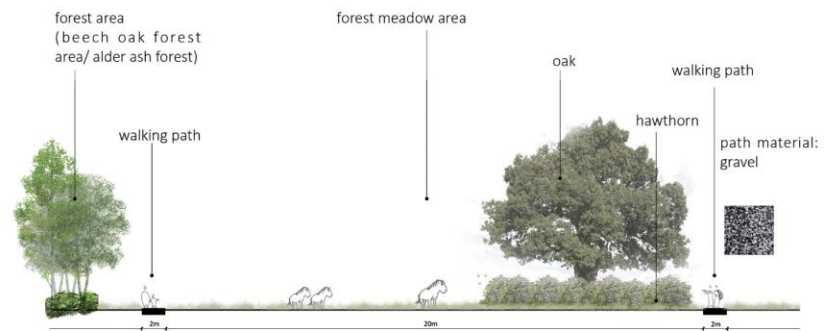


**Rabatten bos** after restoration can offer people a new attractive **recreational place** to view the **historial forest type**. **Dynamic water level** in ditches can be observed when it's raining season and dry season.

## ii. Forest meadow

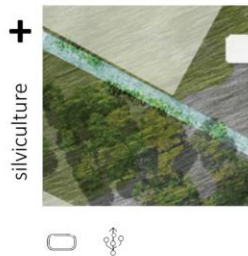


**Forest meadow** not only **reserve** the existing botanical valuable grassland but also collaborates with **Konik horse** to provide a vivid **historical landscape** to visitors.

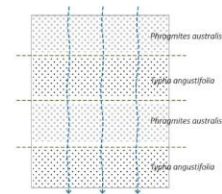
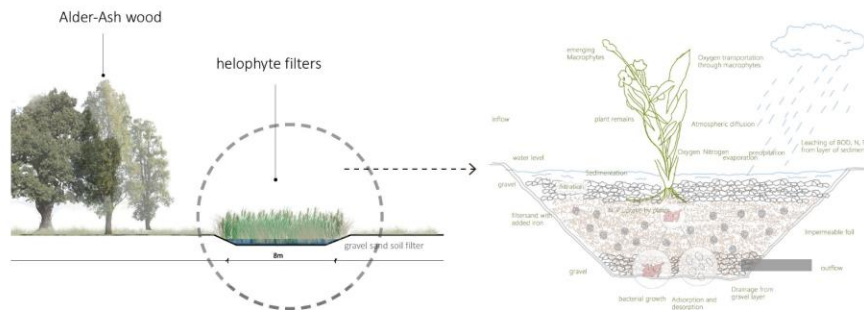




### iii. Stream near the castle



After **purifying water** in the ditches by horizontal helophyte filters, **water quality** could be **enhanced**



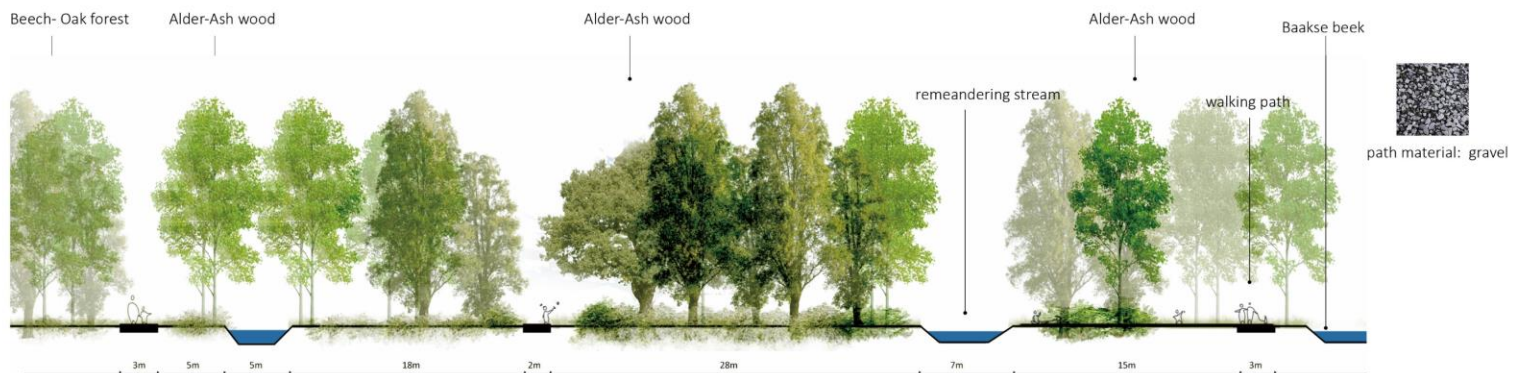
A scheme to show the planting pattern.

The initial planting density is recommended to be 4-6 pieces/m<sup>2</sup>. And planting should be conducted in spring and each year, mowing of these helophytes should be conducted in autumn or winter each year to ensure the younger one can still functions. ([Brix, 1997])

#### iv. Forest park



After opening up the **old forest area** as a park, visitors can experience the **natural enclosure** exploring for the **historical clues** through the forest landscape.







## De Wiersse

Promoted resilience to climate change

Strengthened ecological and societal values

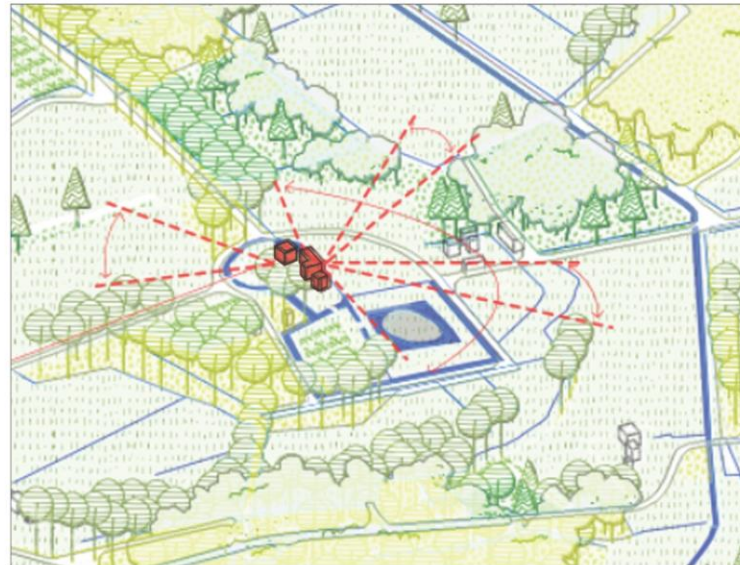
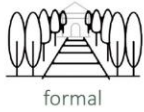
Do positive effects on landscape of other estates, i.e. H' Melder





# Het Medler

## Characters:



## Challenges:



monofunctional meadow



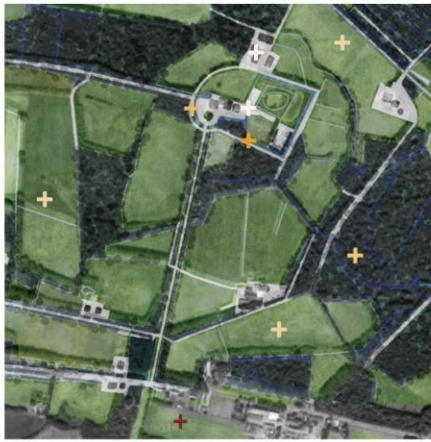
speciesless



insufficient water

## Design process

Current situation



Current situation +Interventions



### Main FLR interventions

silviculture



agroforestry

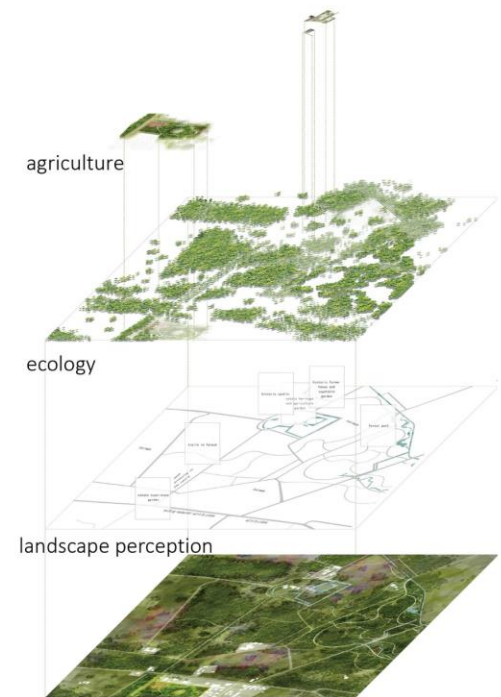


afforestation

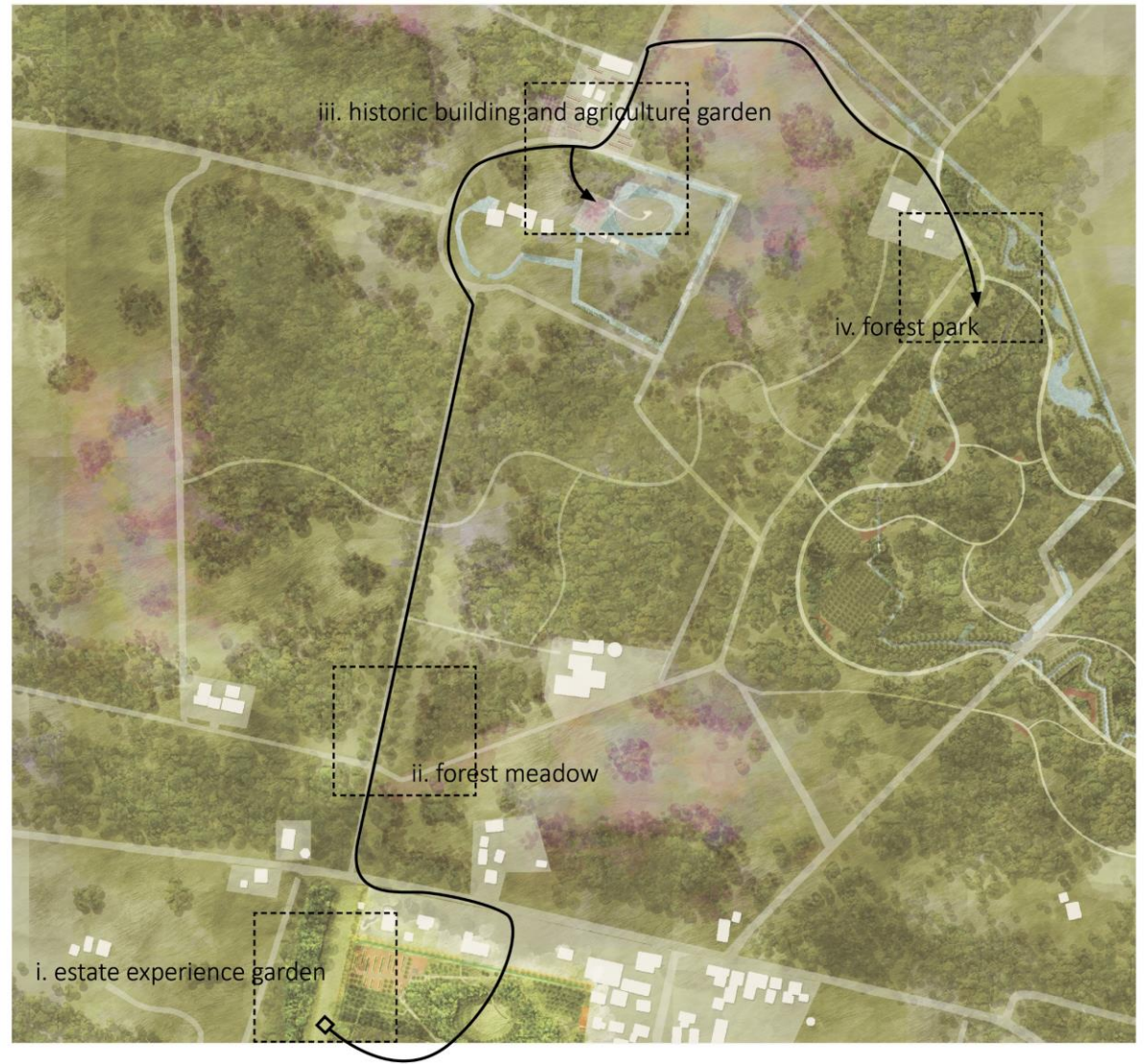




## Design exploration in Het Medler

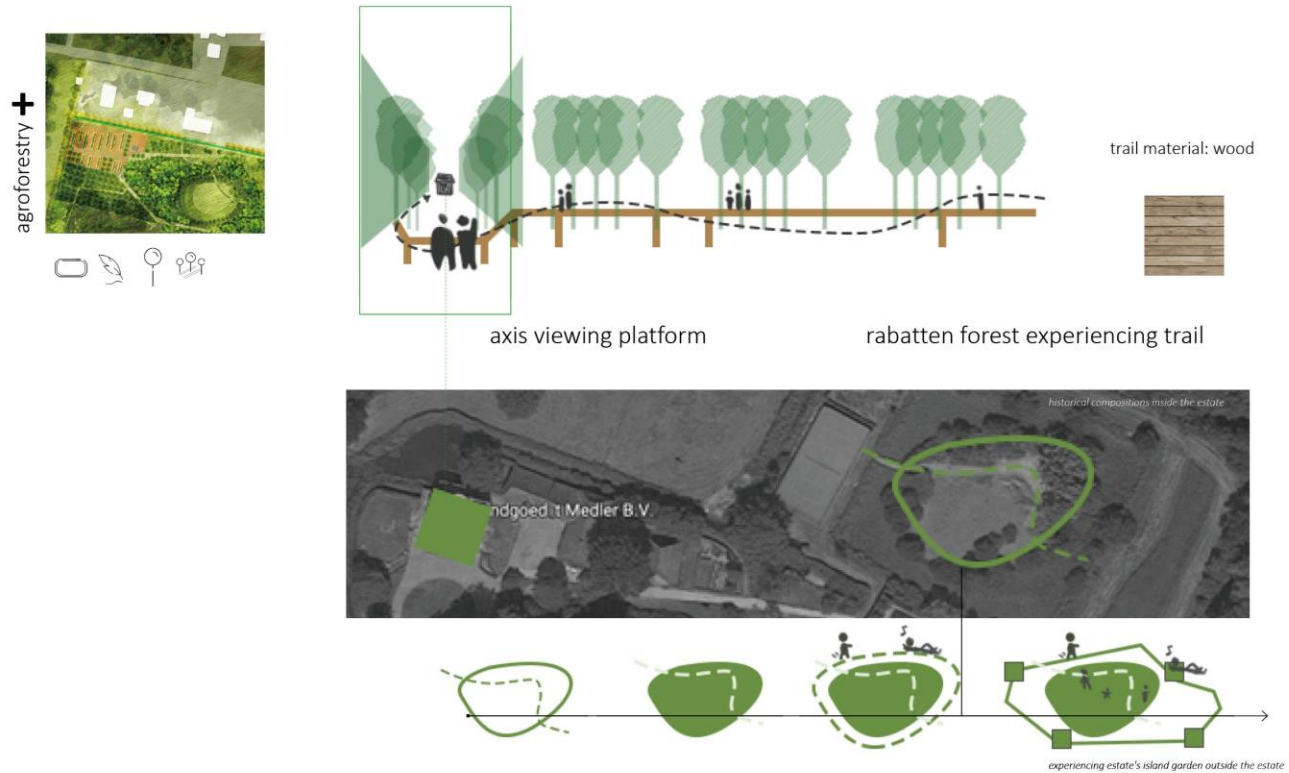


| Experiencing sequence

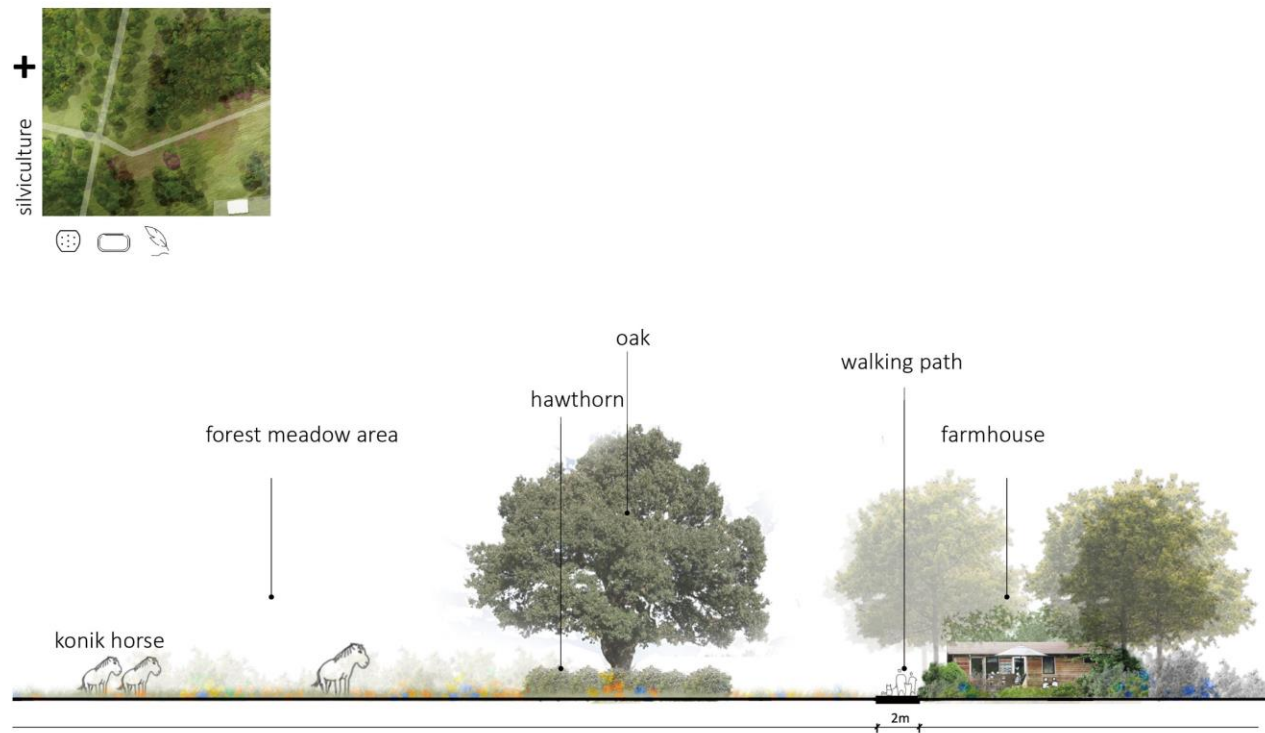




## i. estate experience garden



## ii. forest meadow





Outside  
Estate  
territory



Inside  
Estate  
territory



Newly added forest types attracts visitors to **interact with the estate and experience it better.**

#### iv. forest park



Walking along the path, people can experience  
**different spatial enclosure from forest.**





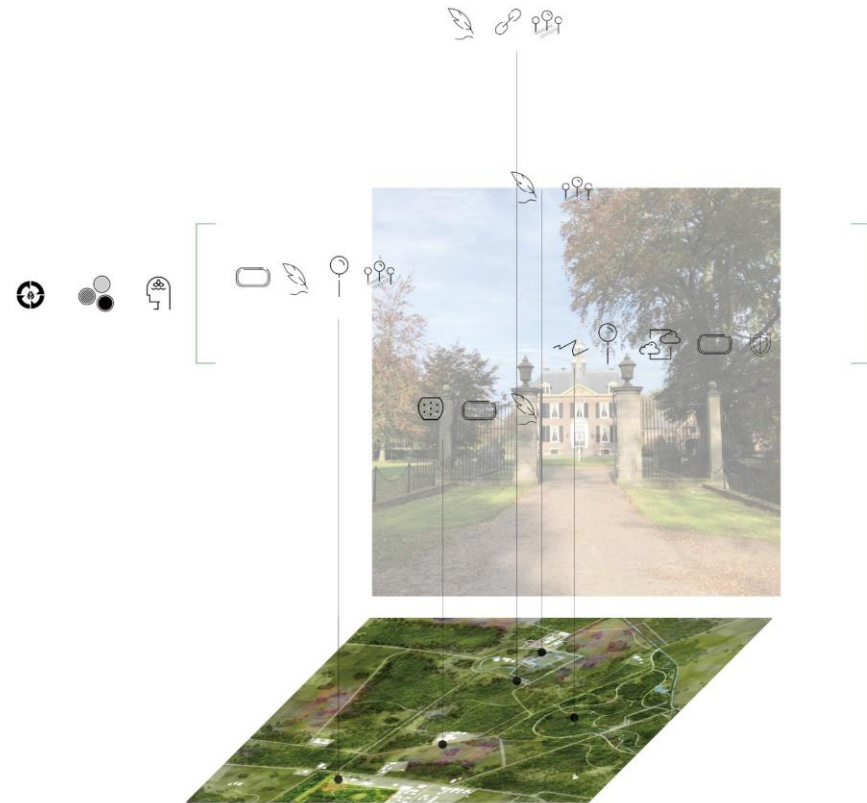
## Het Medler

Benefit to the ecological  
environment

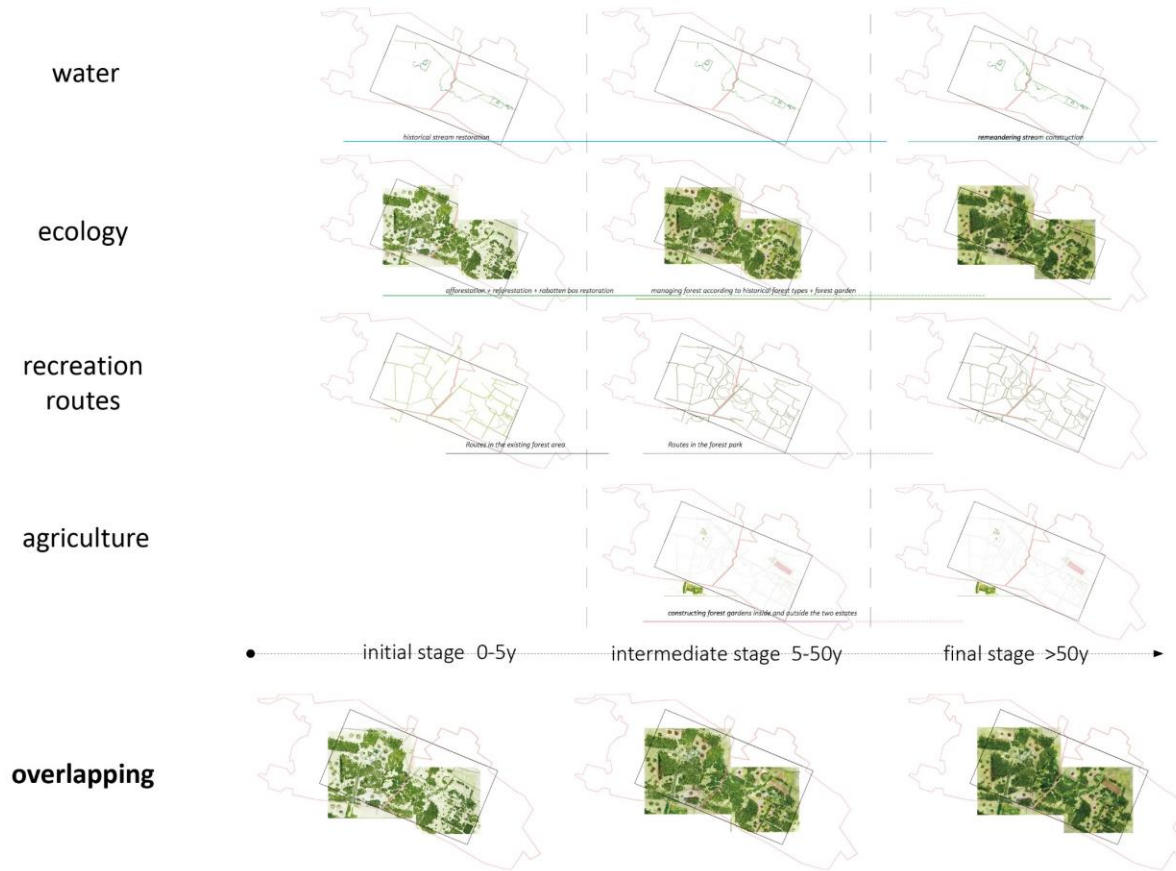
Interaction between historic  
farmhouses and the landscape  
nearby

Awareness of the cultural-historical clues

Revealed relation with De Wiersse and  
surrounding landscape

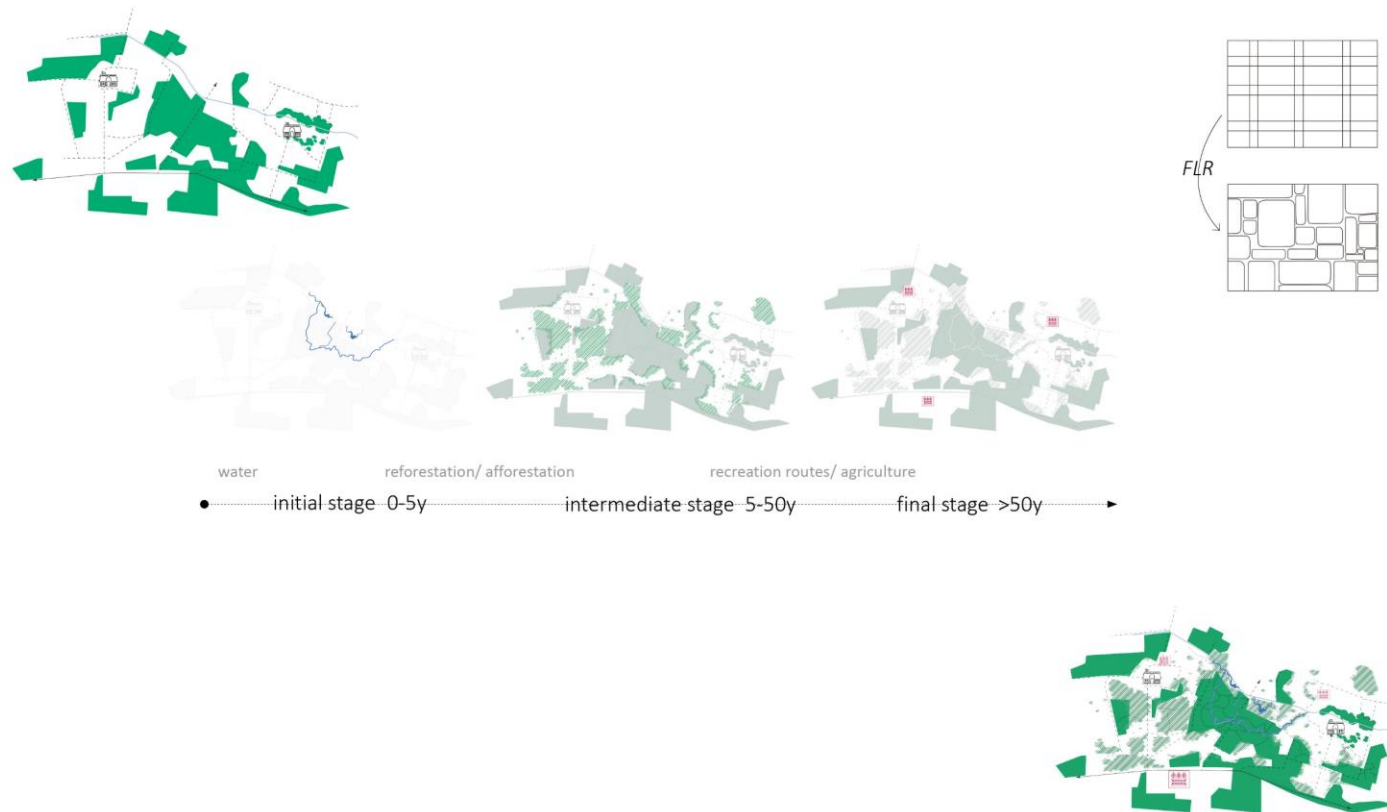


## Phasing and Development

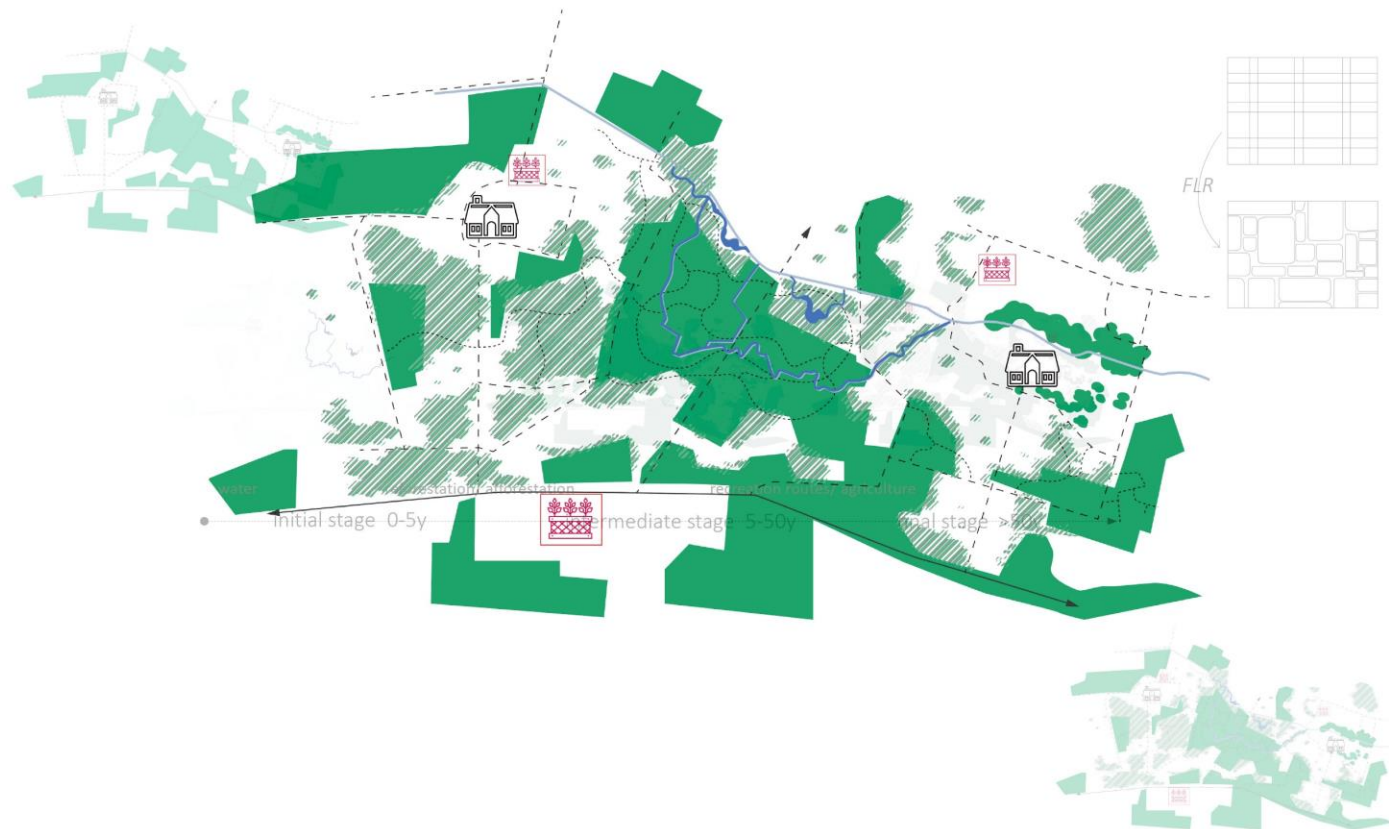




## Spatial pattern development



## Spatial pattern development









## 5. CONCLUSION AND REFLECTION



A photograph of a forest path covered in fallen autumn leaves, with tall trees and a canopy of green and yellow leaves in the background. The path leads into the distance, flanked by dense foliage and large tree trunks.

## Conclusion

This project hopes to show **the estate landscape's potentials**, to call for more attention to **various values of Forest Landscape Restoration**. It's not only about introducing trees on the land, but also about promoting eco-environment and people's wellbeings and revealing the societal and cultural layers of the landscape.

Also, what **FLR** can bring to us must be more than these, which deserves our **further exploration**.





Reflection

+ WHAT CAN WE LEARN FROM THE PROJECT?





"Thanks for listening "