

## II - 10 How will climate change affect spatial planning in agriculture and nature?

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### Introduction

Climate change will introduce many bottlenecks in spatial planning of agriculture and nature. To anticipate on future climate change the development of adaptation strategies is needed to make the Netherlands climate change resistant. The aim of the project is to visualise the spatial bottlenecks in agriculture and nature and to collect existing and new adaptation options suitable for the different regions in the Netherlands. As an example, here will be focused on two regions: the 'Achterhoek' in the eastern part of the country and the 'Green heart' in the western part. Both regions strongly differ in agricultural and nature characteristics and are also differently exposed to the threats from climate change. This means that both regions need a different approach in the development of adaptation strategies.

### Green Heart

#### Characteristics

- Peat-bog and clay
- High density of population
- Intense road network
- Agriculture: Pastures, sugarbeet, cereals and horticulture
- Nature: sweet stagnant water, flowery grass, peat-bog forest

#### Bottlenecks

##### Agriculture

- Grass: production/quality decreases by inundation, salinity, pest and diseases
- Cereals: production/quality decreases by fungi, ears fall down by extreme rainfall
- Sugarbeet: increase of sugar content by salinity, increase of nematodes and bacteria by wetness
- Horticulture: damage by saline inundation, damage to greenhouses by hail

##### Nature

- Stagnant water: quality decreases by salinity
- Flowery grass: increase of C4-grasses by drought
- Forest: internal eutrofyng by inundation

### Achterhoek

#### Characteristics

- Sand
- Low density of population
- Nature reserve
- Agriculture: Pastures, cereals, stock farming
- Nature: brook landscape, wet heather, rich soil forest

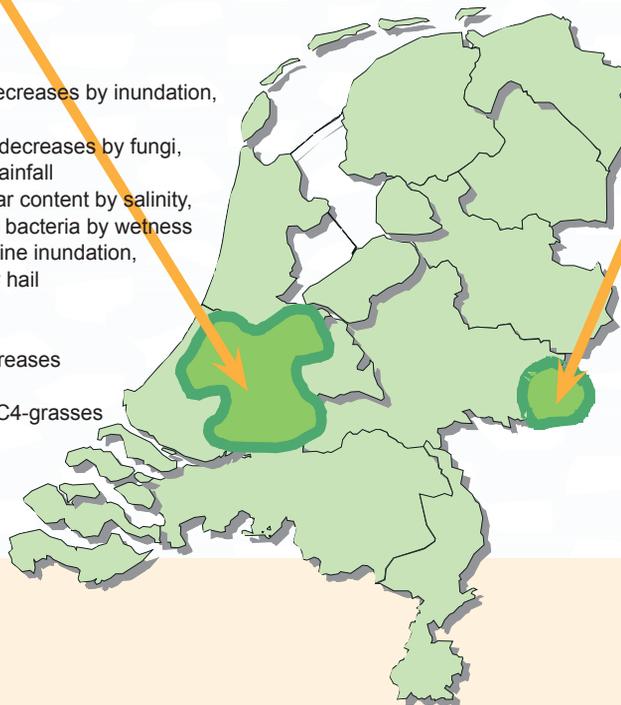
#### Bottlenecks

##### Agriculture

- Pastures: production/quality decreases by drought
- Cereals: production/quality decreases by drought, ears fall down by extreme rainfall
- Stock farming: overheating of animals by sudden temperature rise

##### Nature

- Brook landscape: damage to beds and banks by extreme water discharge
- Wet heather: strong and long lasting desiccation of the top layer
- Forest: decrease of growth, mineralization and eutrofyng by shortage of water



### Adaptation options

#### The Green heart

##### Agriculture

- Introduction of salt resistant and pest resistant cultivars,
- Introduction of fens,
- Subsoil drainage and increase of drainage density,
- Introduction of flowery field borders,
- Introduction of bio-energy crops,
- Introduction of floating greenhouses

##### Nature

- Introduction of buffers with sweet water,
- Increase of water retention by filling in ditches,
- Introduction of a hydrological network

#### The Achterhoek

##### Agriculture

- Introduction drought resistant cultivars
- Irrigation,
- Broadening ditches and increase water level,
- Addition of organic material to increase water retention,
- Changing functions towards other functions (agritourism, social farming, etc)

##### Nature

- Introduction of new brook beds,
- Recovery of ecosystems,
- Introduction of buffer zones for water retention