Towards a more self-sufficient water system in Haaglanden

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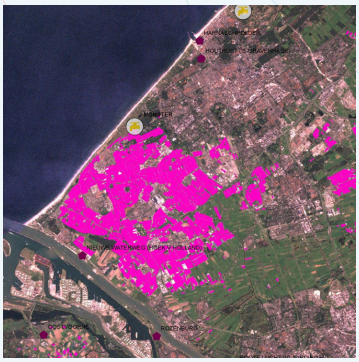
Region Haaglanden/Westland

Most important region in the Netherlands for the greenhouse horticulture

42% of the total greenhouse sector is located in the Westland area



Concern greenhouse sector

To have always sufficient fresh water !!

Future problems

Climate Changes
Sea level rise, variations in the river discharges

Low discharges -----> increase salinity

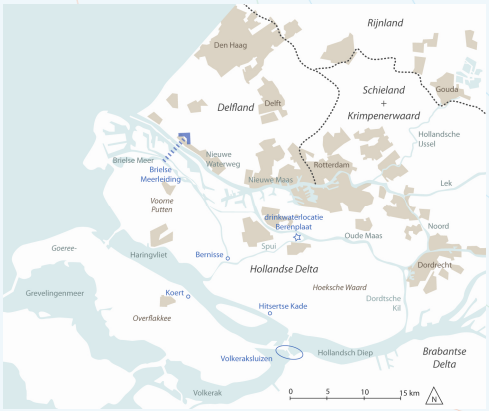
Changes in the policy of the river system
Restore the estuarine dynamics in the Delta region

Examples:
Volkerak Zoommeer: Fresh water → Saline water

Haringvliet: decision to put the sluice in het Haringvlietdam on a gap (fresh → brackish)

Increase salinity: Low river discharge, higher sea level

Greenhouse area depend on fresh water of river system



Climate adaptation strategy

To increase self sufficiency of the region (greenhouse sector) for fresh water

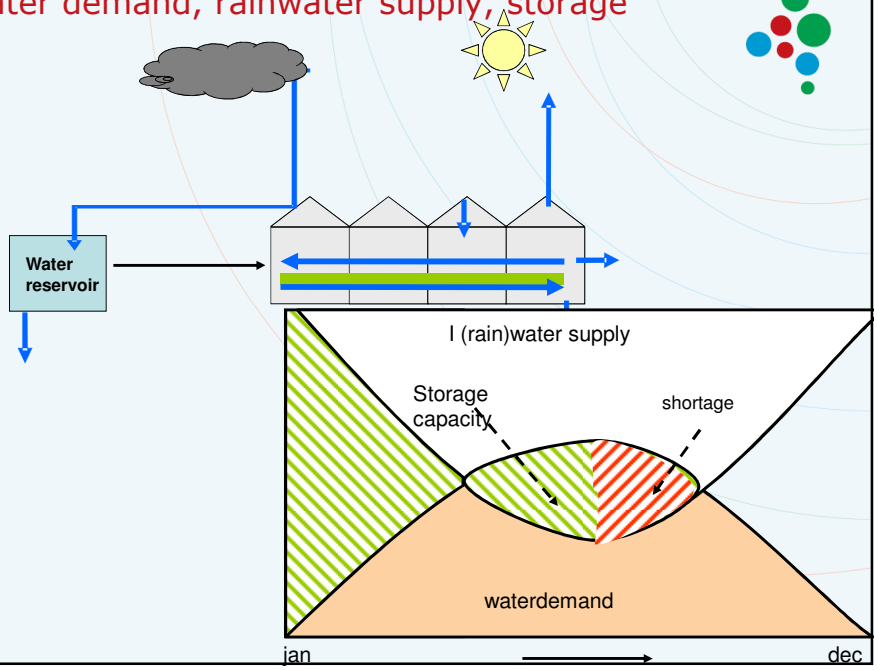
Aim of study

Study the possibilities to increase the self sufficiency of fresh water

How?

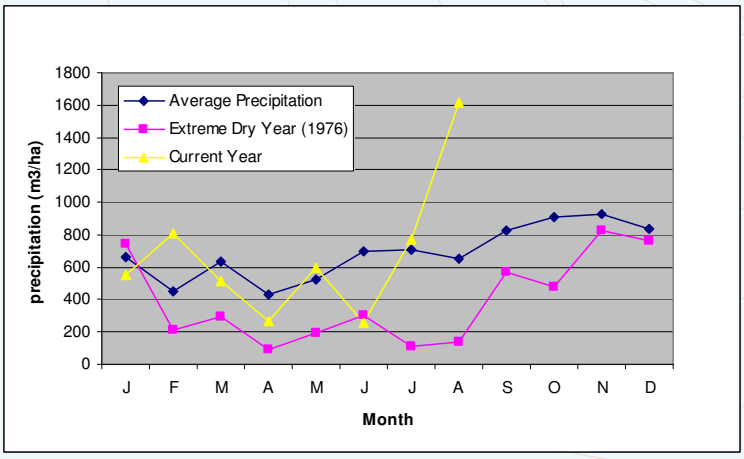
- To make more (effective) use of regional water sources (watertechnology, water treatement)
- Study on various scale levels (individual enterprise – regional scale level)

Water demand, rainwater supply, storage



Rain fall distribution Haaglanden

average water demand (400 – 800 m3/ha.month)



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Water demand

Spatial water demand, depend on
- crop type
- field cultivation or substrate cultivation
- growing season
etc

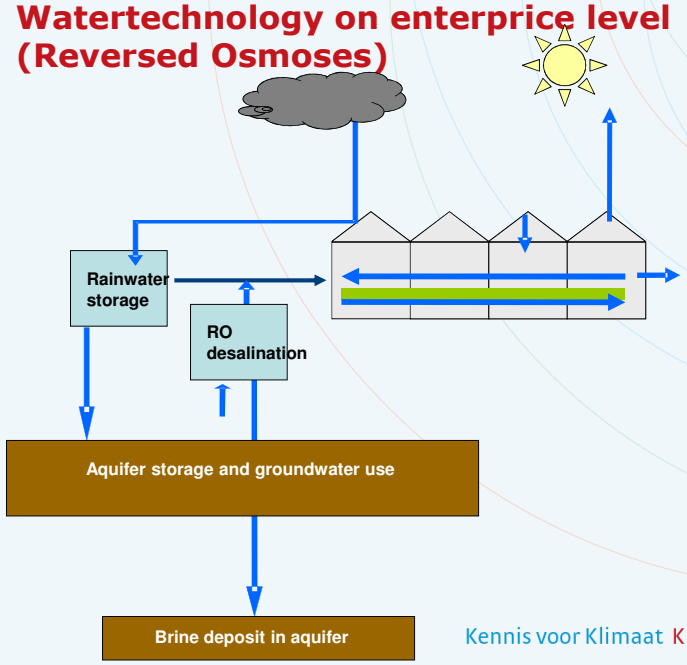
Collecting data

Water quality

Waterquality criteria irrigation water:
<10 mg Cl/L -> always suitable
150 mg Cl/L -> salt tolerant crops

Problem:
Surface water, groundwater contain to much Na (or Cl) → treatment of water

Watertechnology on enterprice level (Reversed Osmoses)



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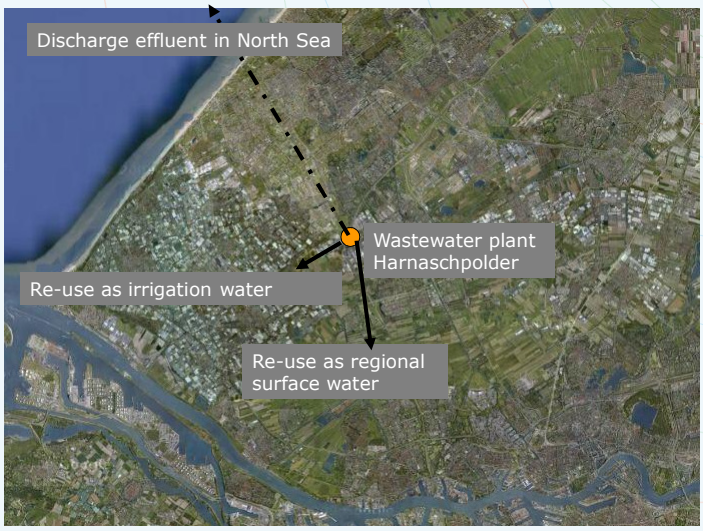
Alternative regional watersources
Re-use of wastewater (Harnaschpolder)



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Re-use of wastewater for surface water/irrigation water

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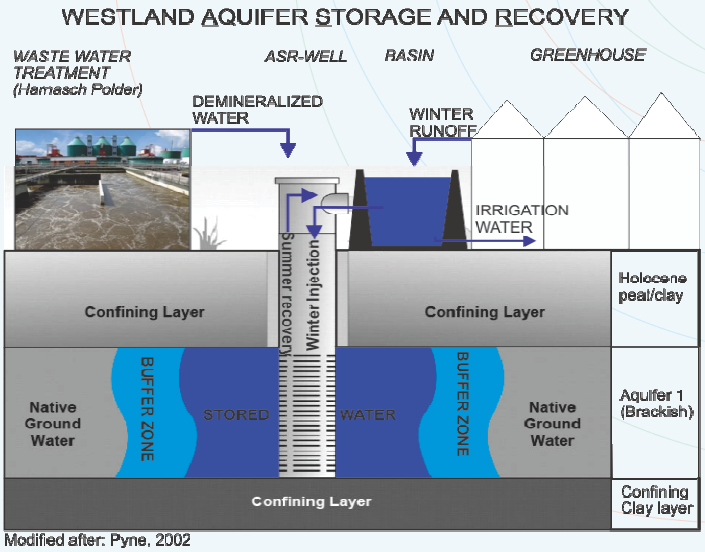
Store fresh water in aquifers



Modified after: Pyne, 2002

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Many questions

Enterprise scale:

- Brine solutions: policy, sustainability?

Regionale scale:

- Many technical questions: improve proces to make suitable irrigation water, transport system, possibilities of ASR etc?
- Acceptance bij greenhouse sector?

→feasibility study

Conclusions

1 Water quantity: no problem,
Water quality is the major problem (salinity)

2. Watertechnology is necessary to obtain qualitative good irrigation water

3. A part of the greenhouse sector has already invested in self sufficiency (RO facilities). The brine is (maybe) a problem.

4. There is a potential alternative fresh water source in the region (Harnaschpolder). Research is needed to optimize the process

5. To store the fresh water in groundwater aquifers (ASR) as buffer, is maybe an essential step. Research to the possibilities will be performed.