



Deltacommissaris



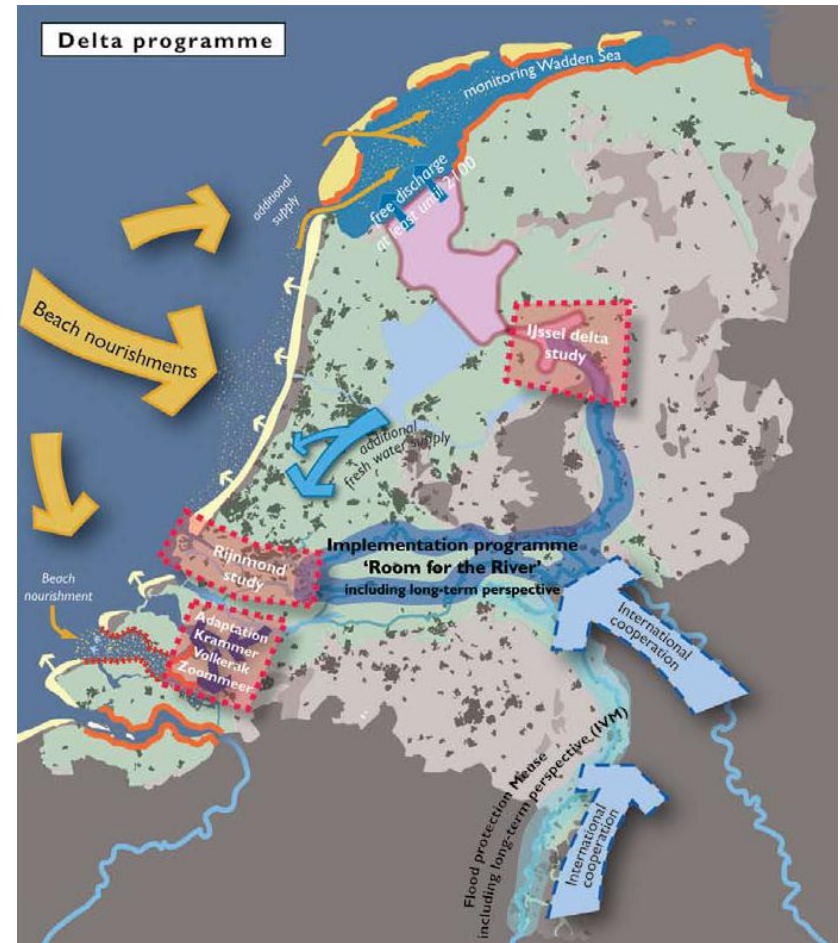
The Delta Programme, how to adapt water management to climate change?

Jos van Alphen
Staff Delta Programme Commissioner

30 January 2013

Delta Commission, 2008:

*The threat is not acute,
but measures to improve
flood risk management and
fresh water supply
should be prepared urgently!*





Delta Programme



One Aim:

- keeping NL a good, safe and attractive place to live and work for present and future generations (→ long term perspective)

Two Goals

- Safe, now and in the future (2050-2100)
- Fresh water supply guaranteed, also in dry periods

Three Basic values:

- Solidarity, Flexibility and Sustainability

Not in answer to a disaster, but in advance, to be prepared or avoid it

Delta program and 5 key decisions, 2014

- 3 national programmes:
 - Safety: standards, Deltadiques
 - Freshwater
 - Reconstruction and development
- 6 regional programmes



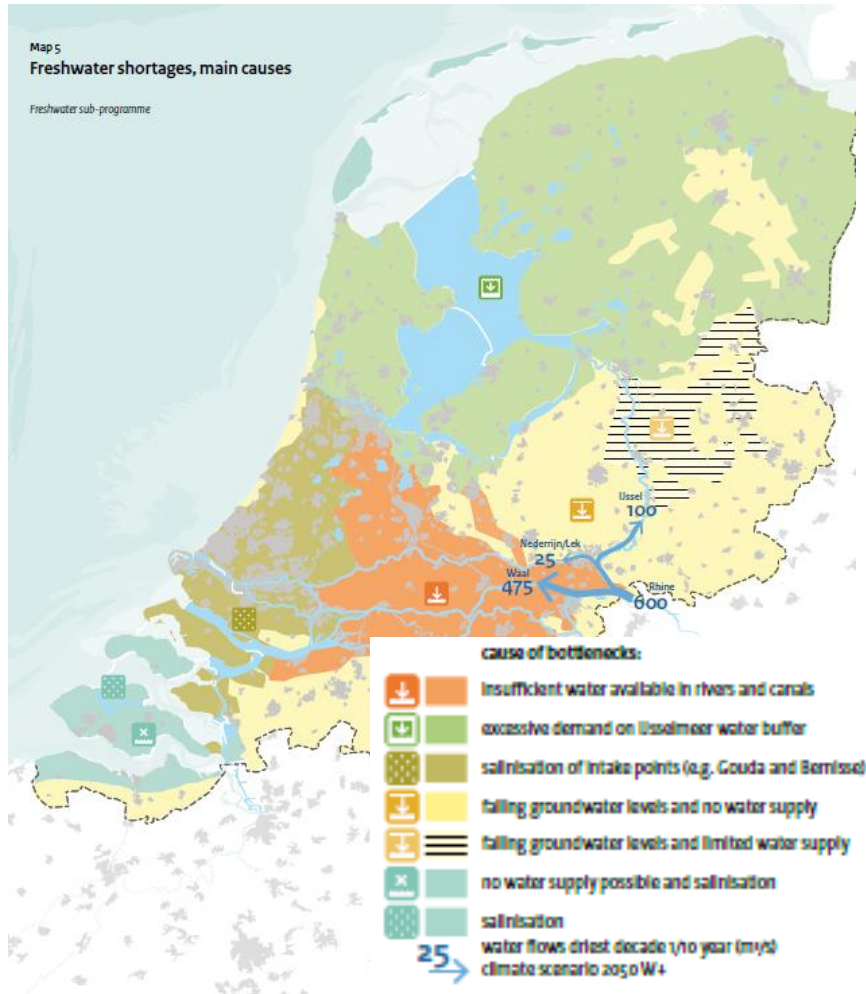
Fresh water supply,



causes and problems

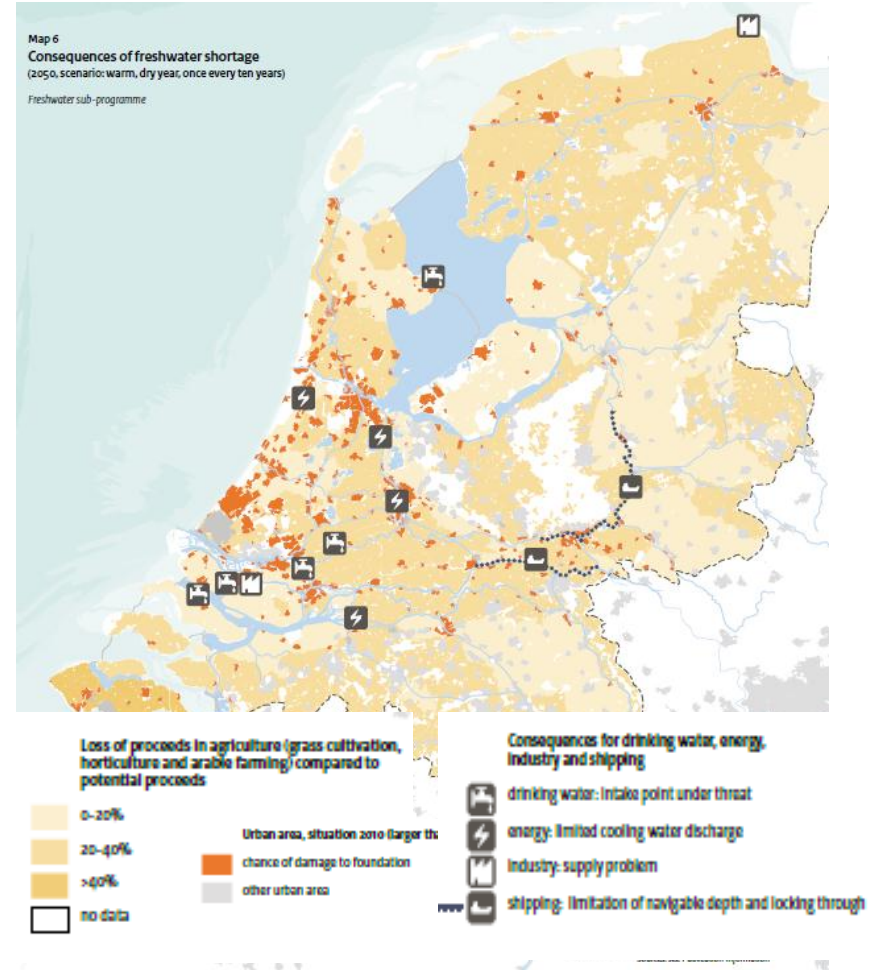
Map 5
Freshwater shortages, main causes

Freshwater sub-programme



Map 6
Consequences of freshwater shortage
(2050, scenario: warm, dry year, once every ten years)

Freshwater sub-programme



Limited fresh water supply and flood risk



Drought:

- Irreversible soil subsidence (peat, clay)
- 2003: Failure of secondary peat dike
- 10 million € damage

(3500 km secondary peat dikes)



Potential measures

1) Reduce fresh water demand:

- Local storage in soil
- Drought and salt resistant crops
- More effective irrigation of crops

2) Improve water supply:

- Increase storage in lake IJssel (→ 40 → 90 cm)
- Alternative fresh water supply to central Holland

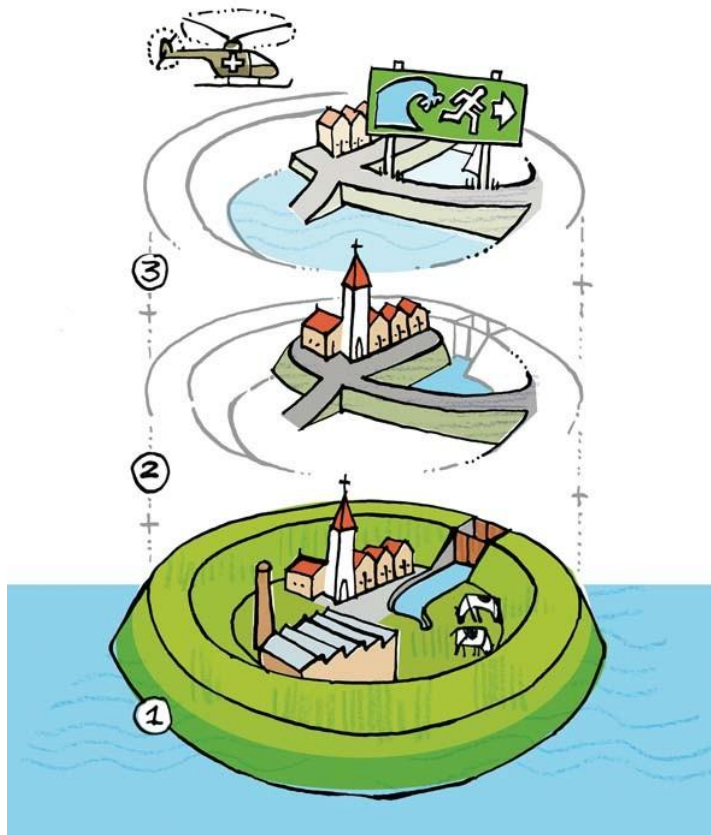
3) Reduce salt intrusion Rhine estuary by:

- “curtain” of air bubbles
- Closure (navigation!!)

Decide on:

- Role and responsibilities authorities
- Basic level of supply
- Public-private

Flood Risk Management policy (2009, EU Floods Directive)



Multi-layered approach:

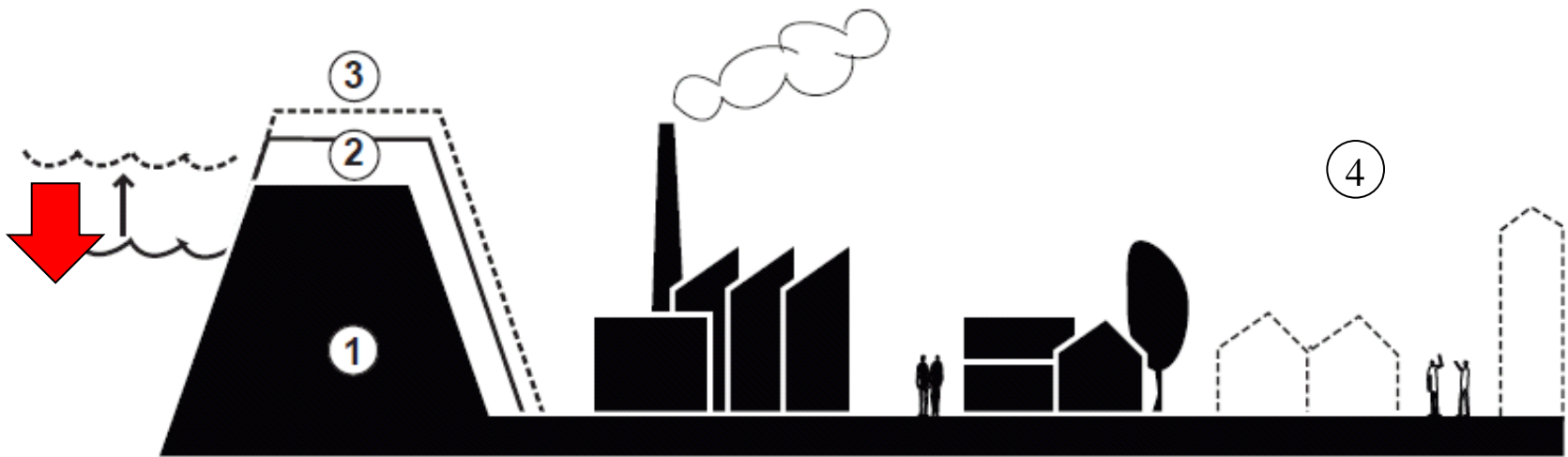
3. Disaster management

2. Land use planning

(new developments,
vital infrastructure)

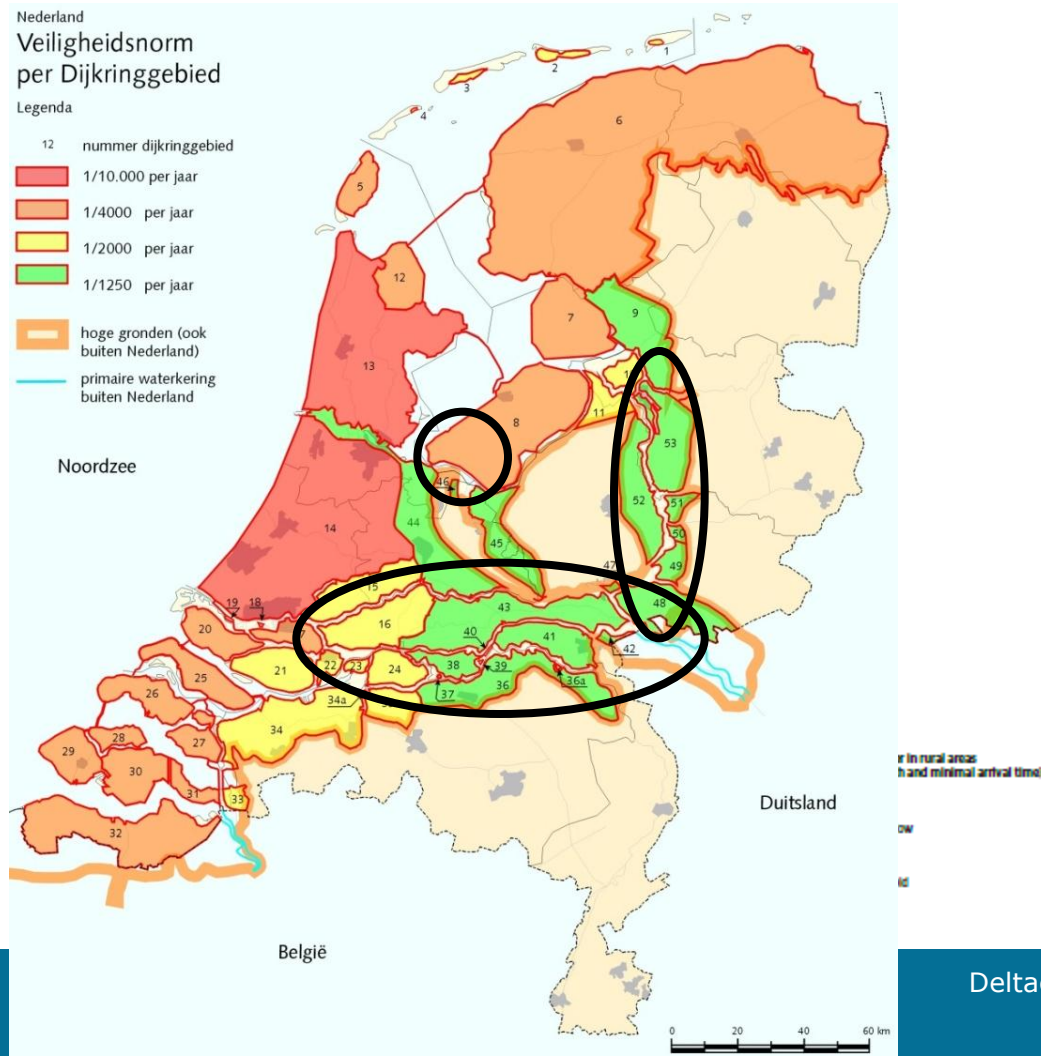
1. Protection

Combined in implementation



1. Comply with present protection standards
2. Maintain protection standards, despite subsidence and climate change
3. Improve protection level (increased population and economic value)
- Combine 1,2,and 3 (design and planning/implementation)
4. Reduce residual risk by land use and disaster mngt. (→ vital infrastructure, flood proof new developments)

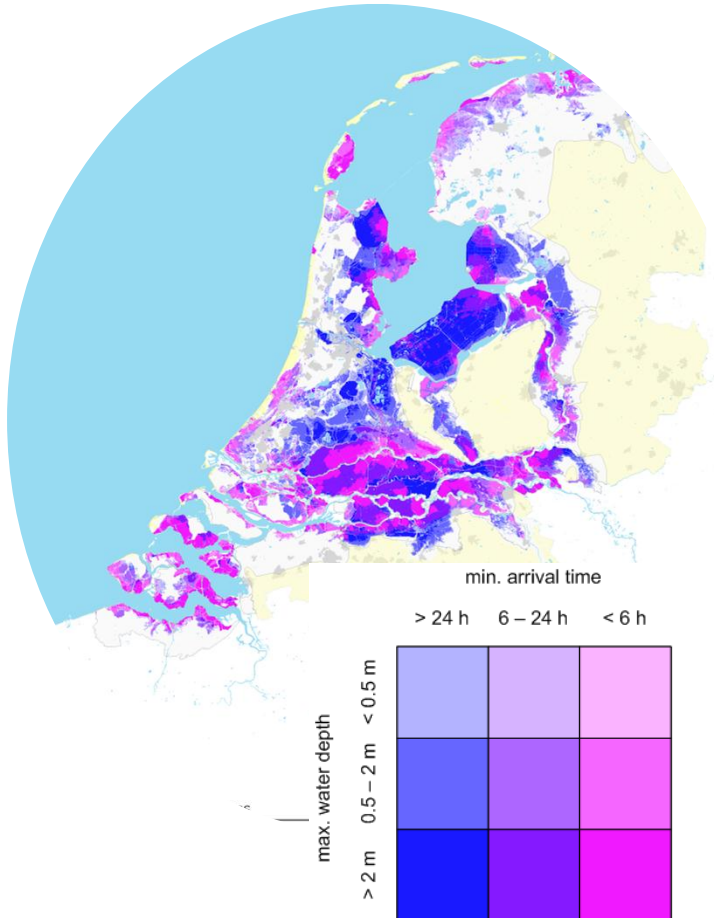
Ad 3 Review protection standards



Upgrade protection standards, considering:

- Loss of life ($\rightarrow 10^{-5}$)
- Economic damage
- Societal disruption

Ad 4. Land use planning



Improve flood resilience

Pluvial floods

< 0.5 m: deal with / reduce disturbance:

→ flood proofing of buildings,
vital infrastructure and services

0.5 – 2.0 m. prevent long term disruption and
improve recovery:

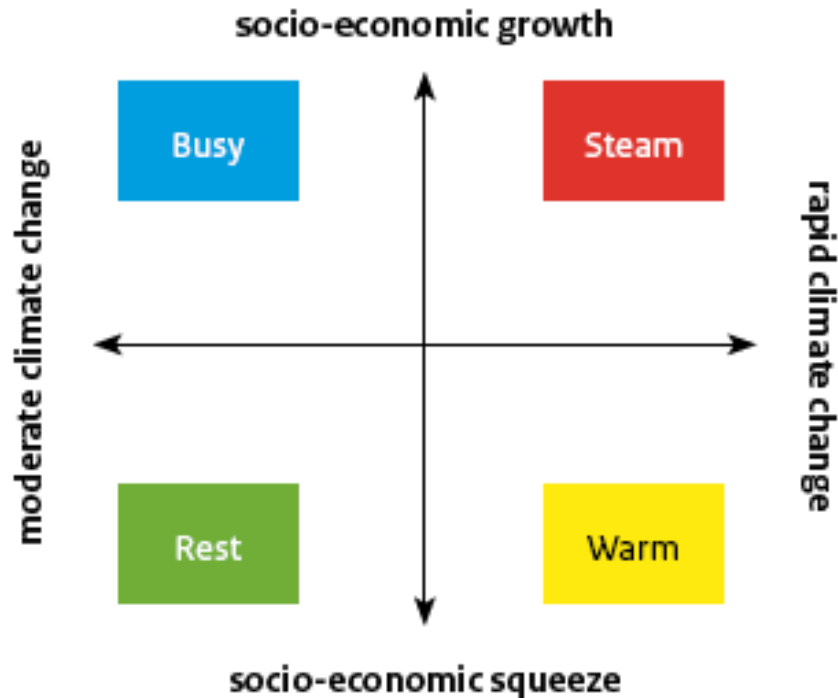
→ flood proofing of buildings and
vital infrastructure and services
(electricity)

> 2.0 m: disastrous, long term disruption:

→ evacuate, shelters, guarantee
communication lines,



Uncertain future → scenario's



- Climate change
 - Socio-economic developments
 - population,
 - economy,
 - land use/urban development
 - fresh water demand
- 1) When will current policies fail?
→ "tipping points",
 - 2) What future should we prepare for?
→ inspiration for new strategies,
 - 3) How will strategies perform under different conditions?
→ robustness test

Uncertain future → Adaptive strategies:



- Connect short term decisions (in physical domain) with long term water challenges
 - Link with other (short term) investment agenda's ("aging infrastructure")
 - Able to speed up or slow down, or flexible to change to another strategy
- Spatial reservations for future dike enforcements, water discharge or storage

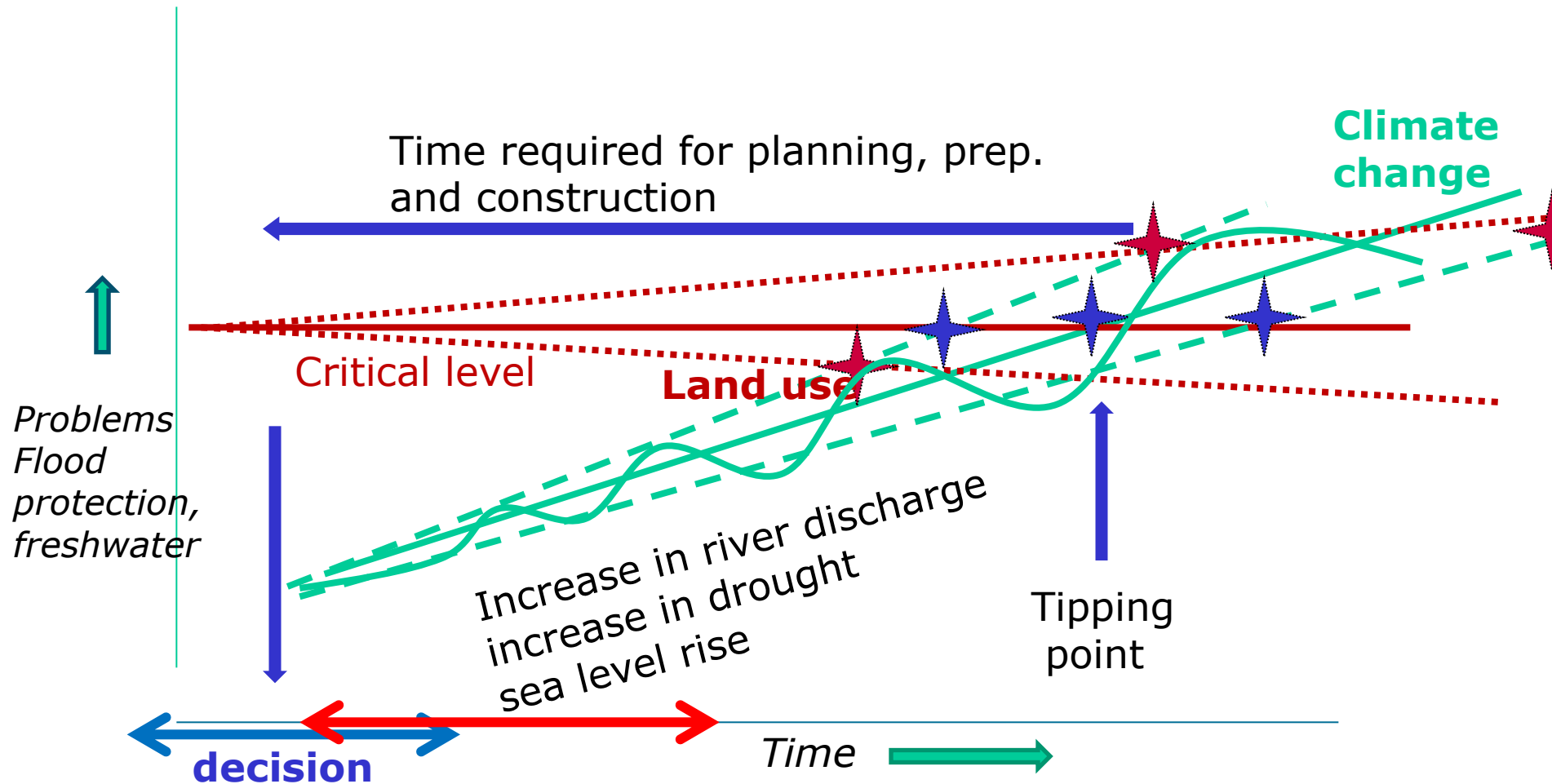


“Working together with water”

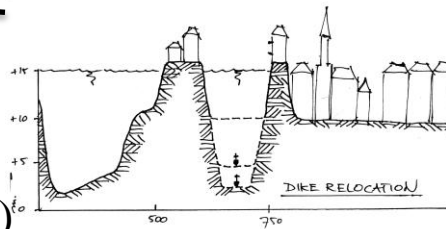
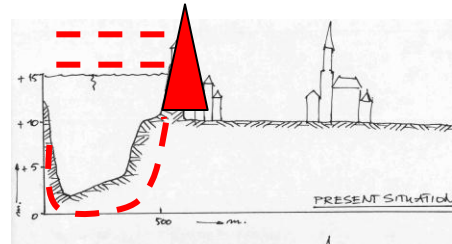
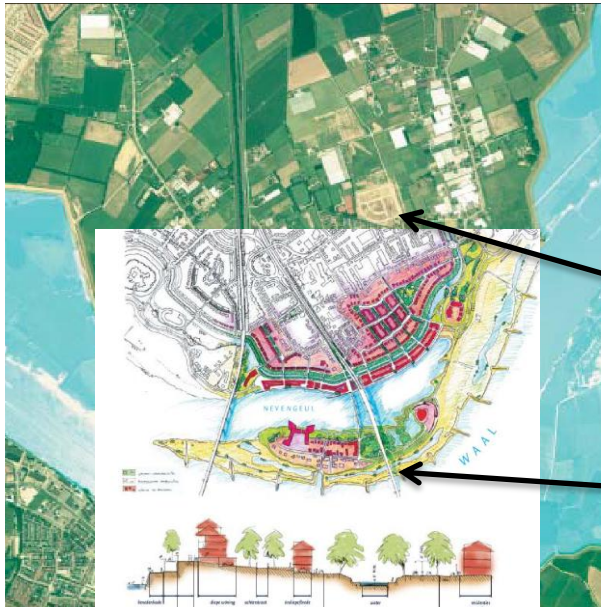
www.deltacommissie.com

“Working on the Delta”

www.deltacommissaris.nl



Dike relocation Nijmegen



< 2015: + 660 m³/s (30 cm)
 2015- 2100: +1200 m³/s (60 cm)
 < 2005: +6500 houses



Prerequisites for future-proof implementation

- Delta Program (= measures, yearly update, presented to Parliament)
- Delta Decisions (strategic, 2015)
- Delta Commissioner,
supervising adequate (regional) multi-governmental
implementation
- Delta Fund, 1000 M€ / y
- Delta Act, “anchoring” Delta-commissioner, programme and fund