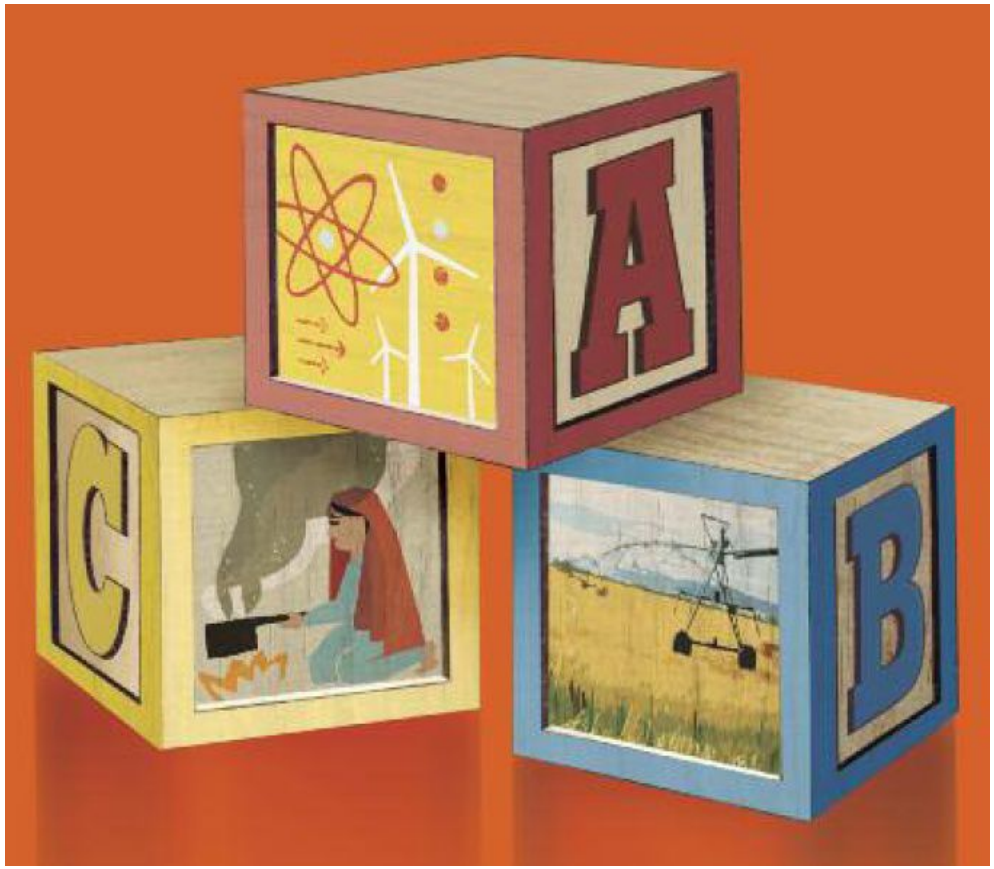


“How does the Dutch adaptation experience position The Netherlands to deal with future climate risks”

Innovation in adaptation and the Deltaprogramme

Pieter Bloemen
Staff Delta Programme Commissioner – Netherl.
Adaptation for a High-Energy Planet – Workshop Washington DC - December 10, 2013

Jon Elster

"Essentially by-products" → innovation

Innovation can be a by-product of (amongs others):

- Actions *in general:* serendipity
- *Focussed:* reacting to opportunities; mainly in private domain
- *Focussed:* reactions to threats; mainly in public domain

Action / innovation in public domain: threat → challenge

Safety against floodings:
After a disaster: threat → challenge

Preventing a disaster: threat → additional challenges

From threat (domination of Russia in space) to challenge

"We choose to go to the moon. We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win, and the others, too."

John F. Kennedy

Watersafety and innovation: no automatic match Need for additional challenges

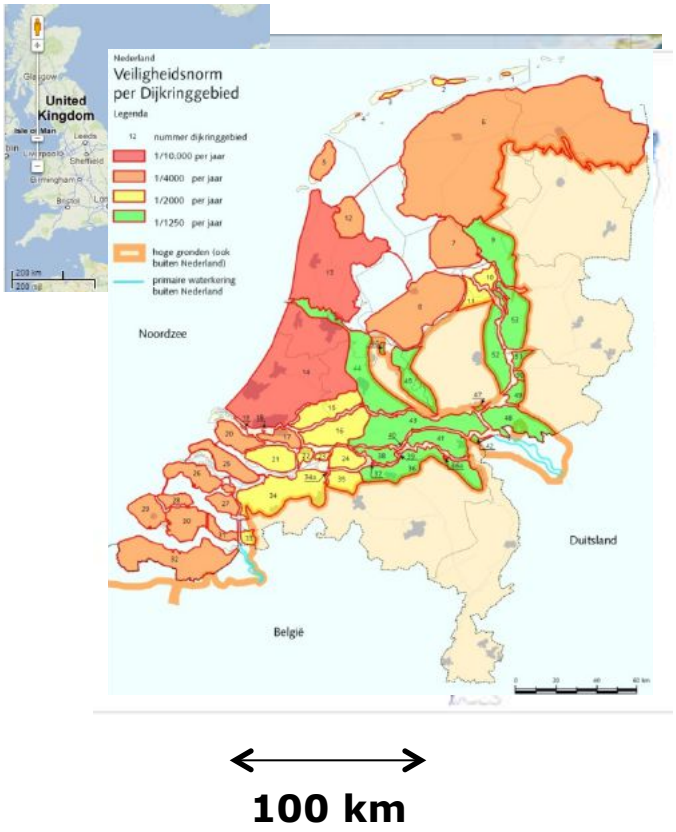
Innovative techniques in safety against flooding; too risky?

"You are responsible, forever, for what you have tamed. You are responsible for your rose"
Antoine de Saint-Exupery

Damage due to climate change
→ 'act of God'

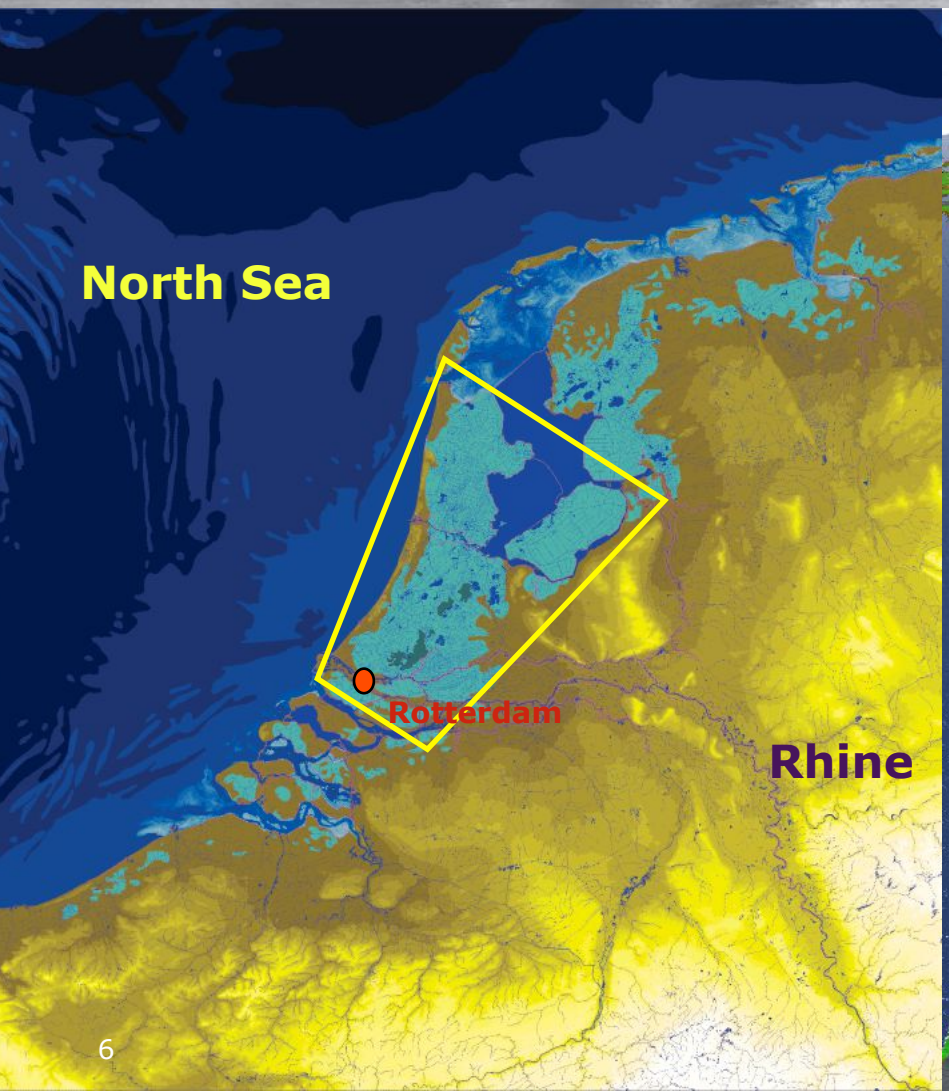
Damage due to inadequate protection
→ 'act of the Directorate General for Public Works and Water Management'

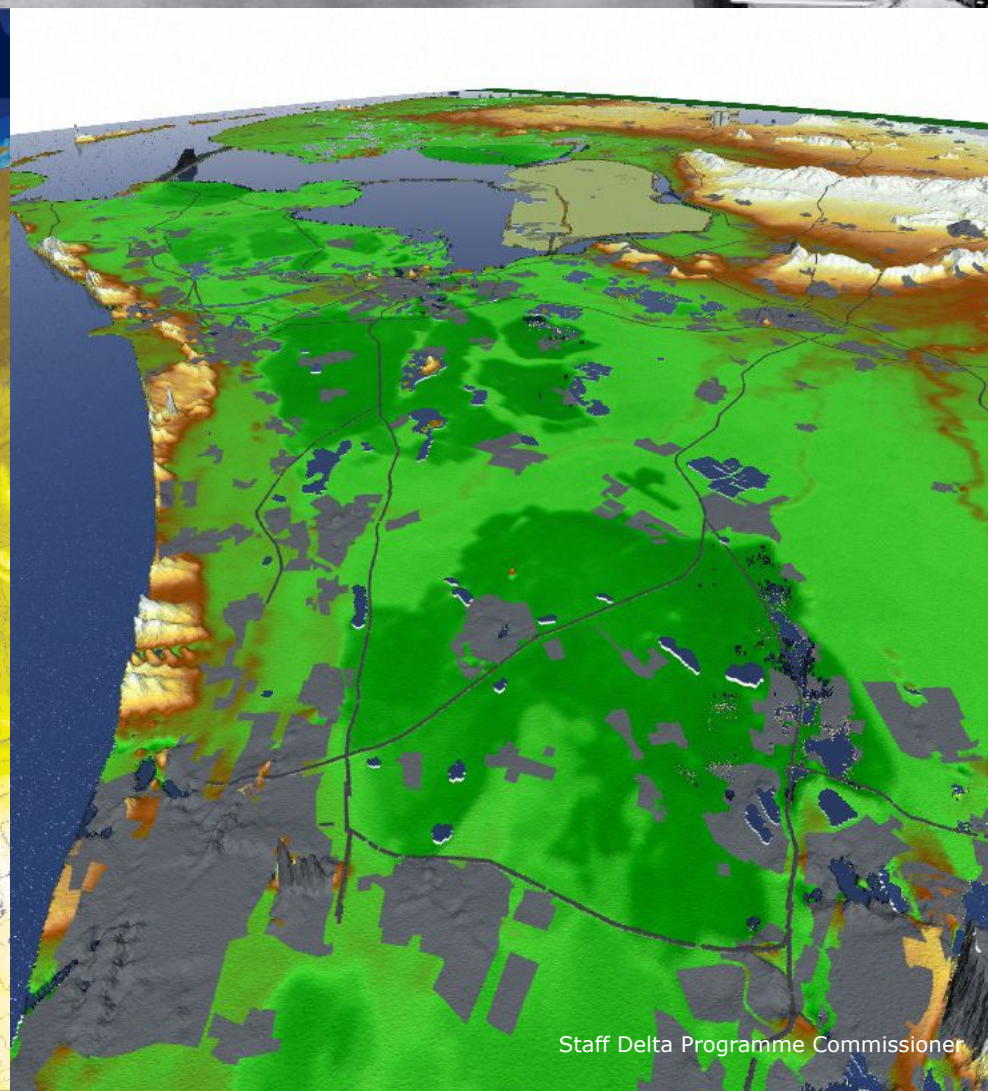
The Netherlands' exposure profile



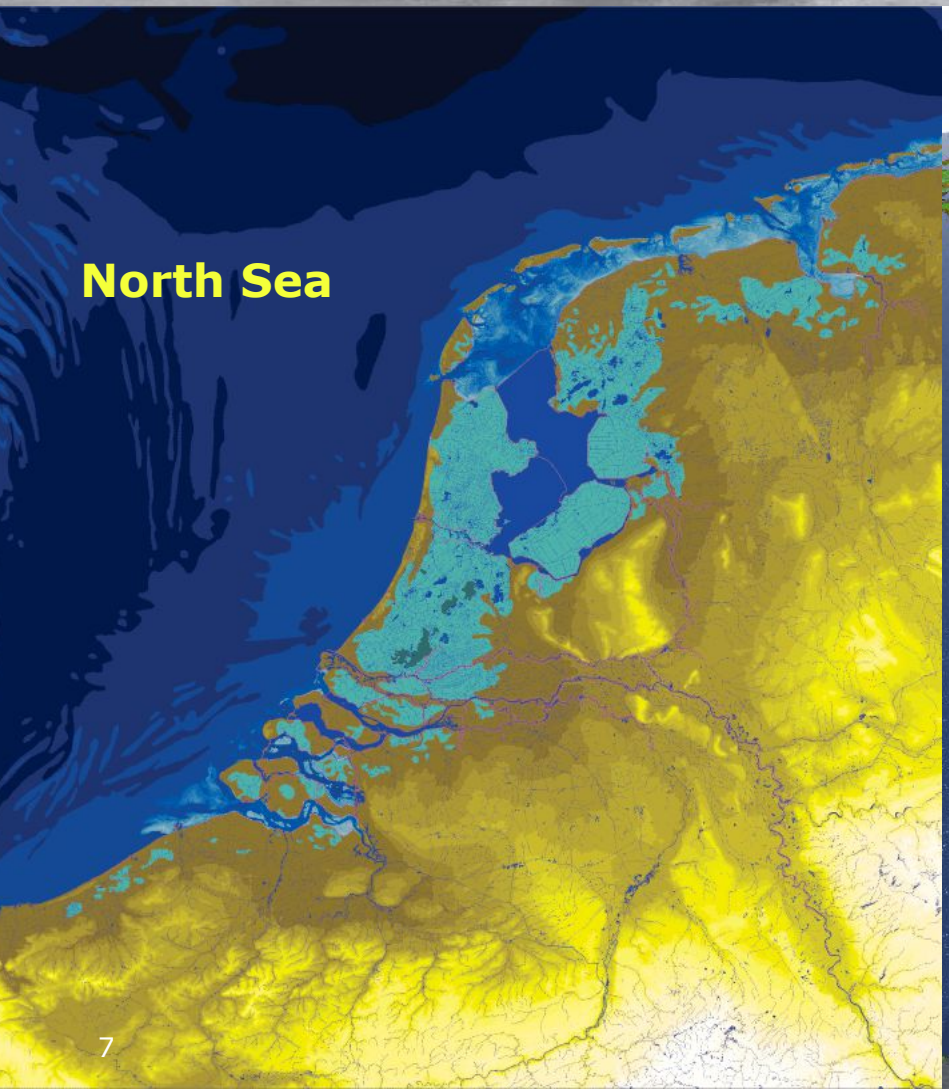
- About 400 km of Rhine river
- International catchment
- 60% flood prone
- About 9 million inhabitants below flood level
- GDP 600 bln euro
- High protection level
- 3500 km of flood defences, hundreds of locks, sluices, pumping stations

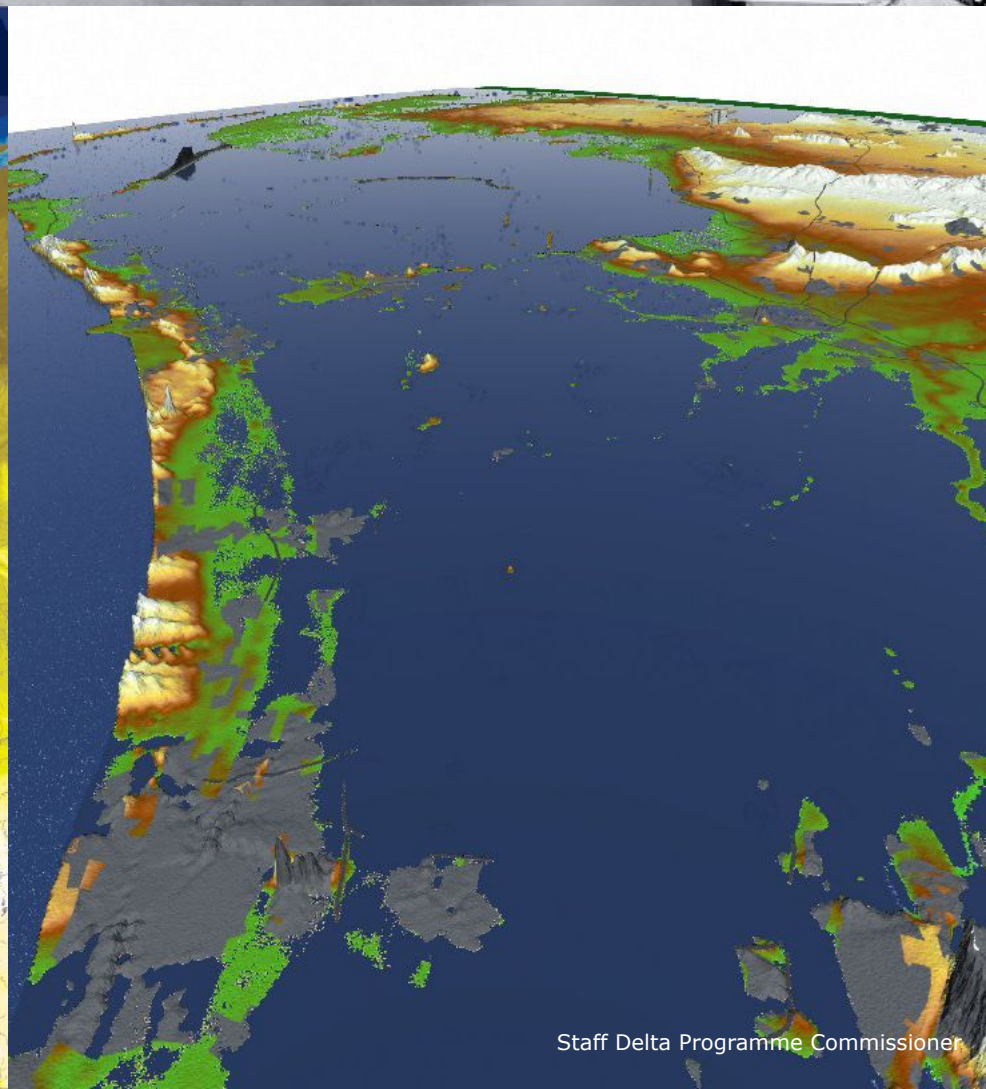
Vulnerability to flooding

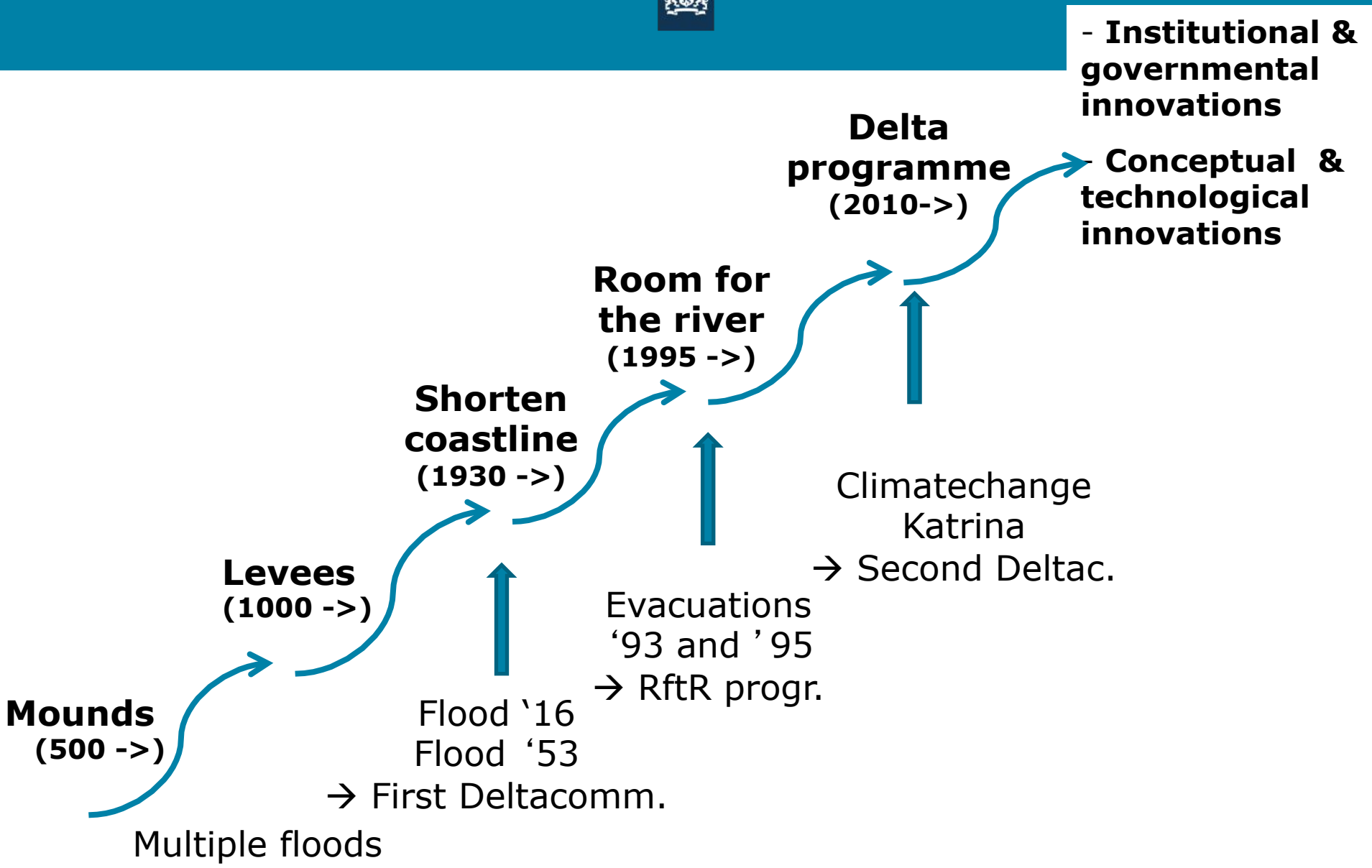




If we would do nothing……






- Institutional & governmental innovations
- Conceptual & technological innovations
Delta programme (2010->)
Room for the river (1995 ->)
Shorten coastline (1930 ->)
Levees (1000 ->)
Mounds (500 ->)
Climatechange
Katrina
→ Second Deltac.
Evacuations
'93 and '95
→ RftR progr.
Flood '16
Flood '53
→ First Deltacomm.
Multiple floods

Mounds; 500 →

Staff Delta Programme Commissioner

Levees; 1000 →

Staff Delta Programme Commissioner

Shortening the coastline; 1930 →

Staff Delta Programme Commissioner

Bypass Lent near Nijmegen

Room for the river; 1995 →

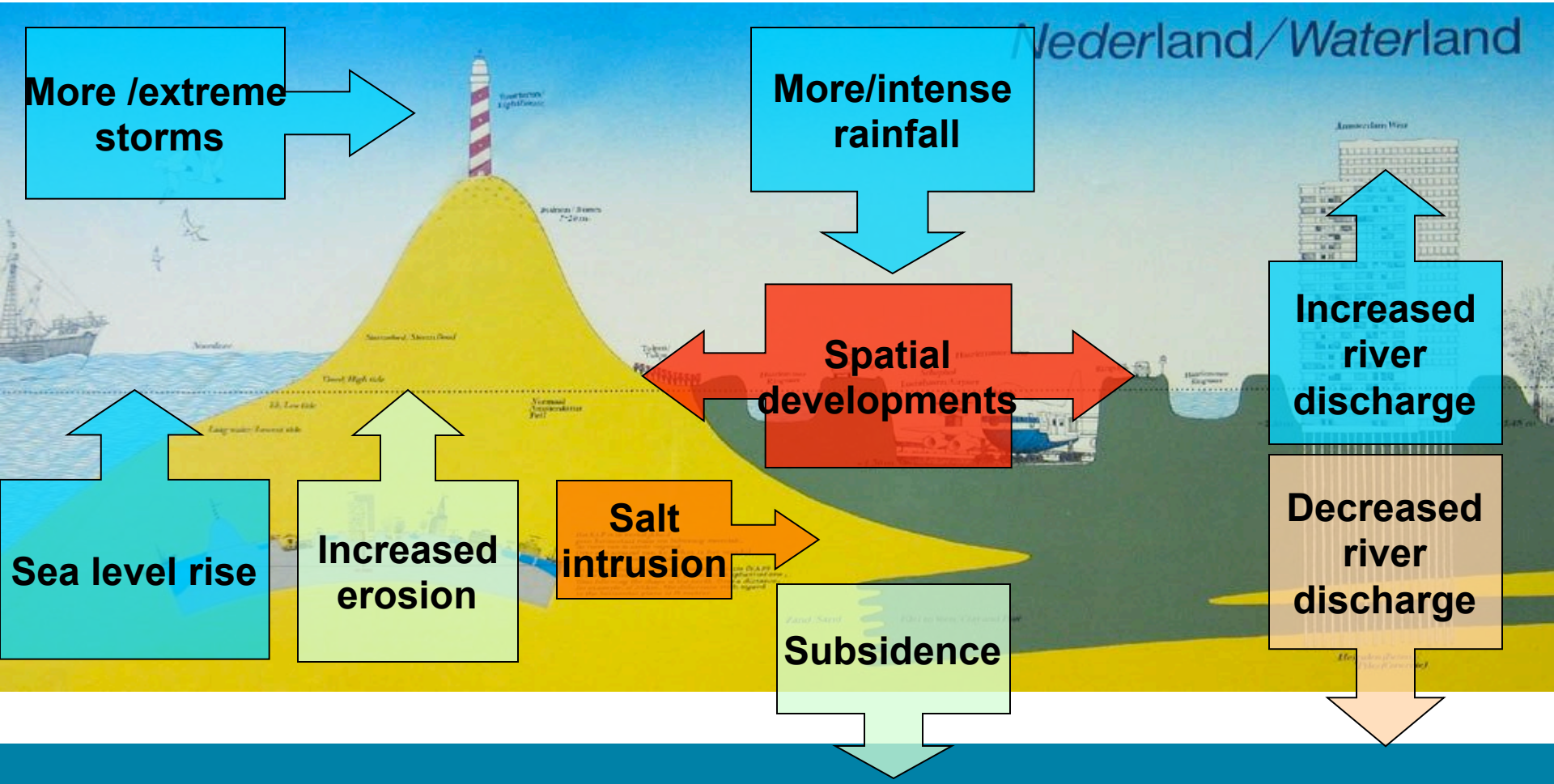
Urban environment

Staff Delta Programme Commissioner

Mounds in Overdiepse polder

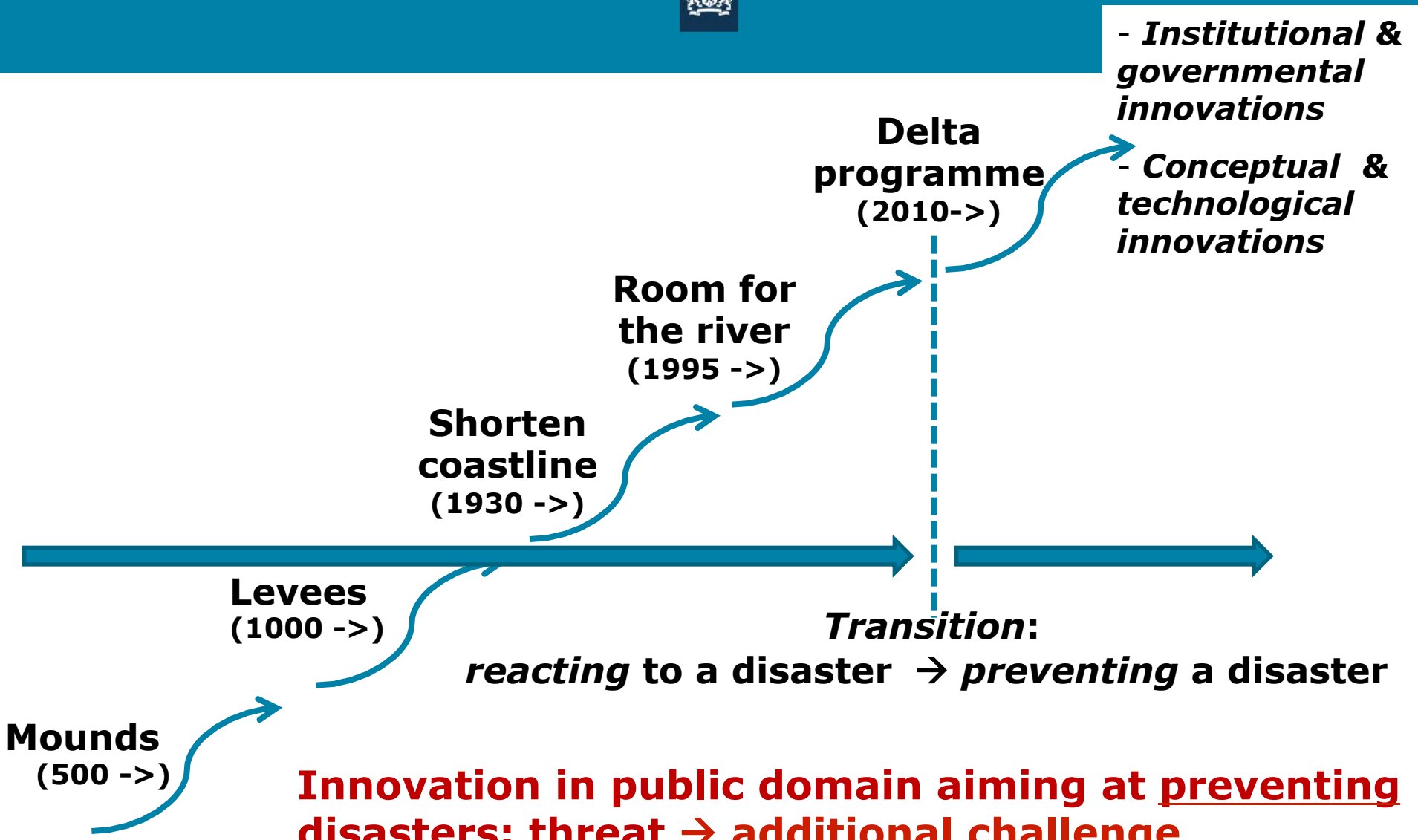
Room f.t. river; 1995 →
Rural environment

The present & future: Delta under increasing pressure



Deltaprogramme

- Watersafety and freshwatersupply
- Deltalaw and Deltacommissioner
- Deltafund; 1 billion euro/year
- Delta Decisions in 2014/15:
  - *Safety standards + programme*
  - *Freshwater strategy + measures*
  - *Urban and spatial restructuring*
  - *Ijsselmeer-lake and Rotterdam-area*
- Six regional strategies



Innovation in public domain aiming at preventing disasters: threat → additional challenge

An additional challenge for water safety in The Netherlands

Observation:

An increasing mismatch between

the flexibility needed to accommodate socio-economic developments and a changing climate

and

deepening furrows in (a.o.) water safety and fresh water supply

Additional challenge # 1:

Transform the present relatively 'rigid' water-landuse-system, evolved to match the present climate,

in

a system that is **more robust** to **present variability** and **more flexible** for dealing with a **changing climate**

Deltaprogramme innovations

→ Institutional and governmental innovations

- Government commissioner
- Deltafund and Deltaprogramme
- All layers of government are partners
- NGO's and private sector actively involved

I. Organise:
- **Stability**
- **Broad commitment**

→ Conceptual and technological innovations

- Basic safety + customizing safetylevels
- Adaptive deltamanagement
- Multi-functional solutions
- Risc approach + multi-level safety

II. Connect:
- **Water mngt - landuse / city planning**
- **Long / short term**

3d layer= preparedness, evacuation measures, recovery

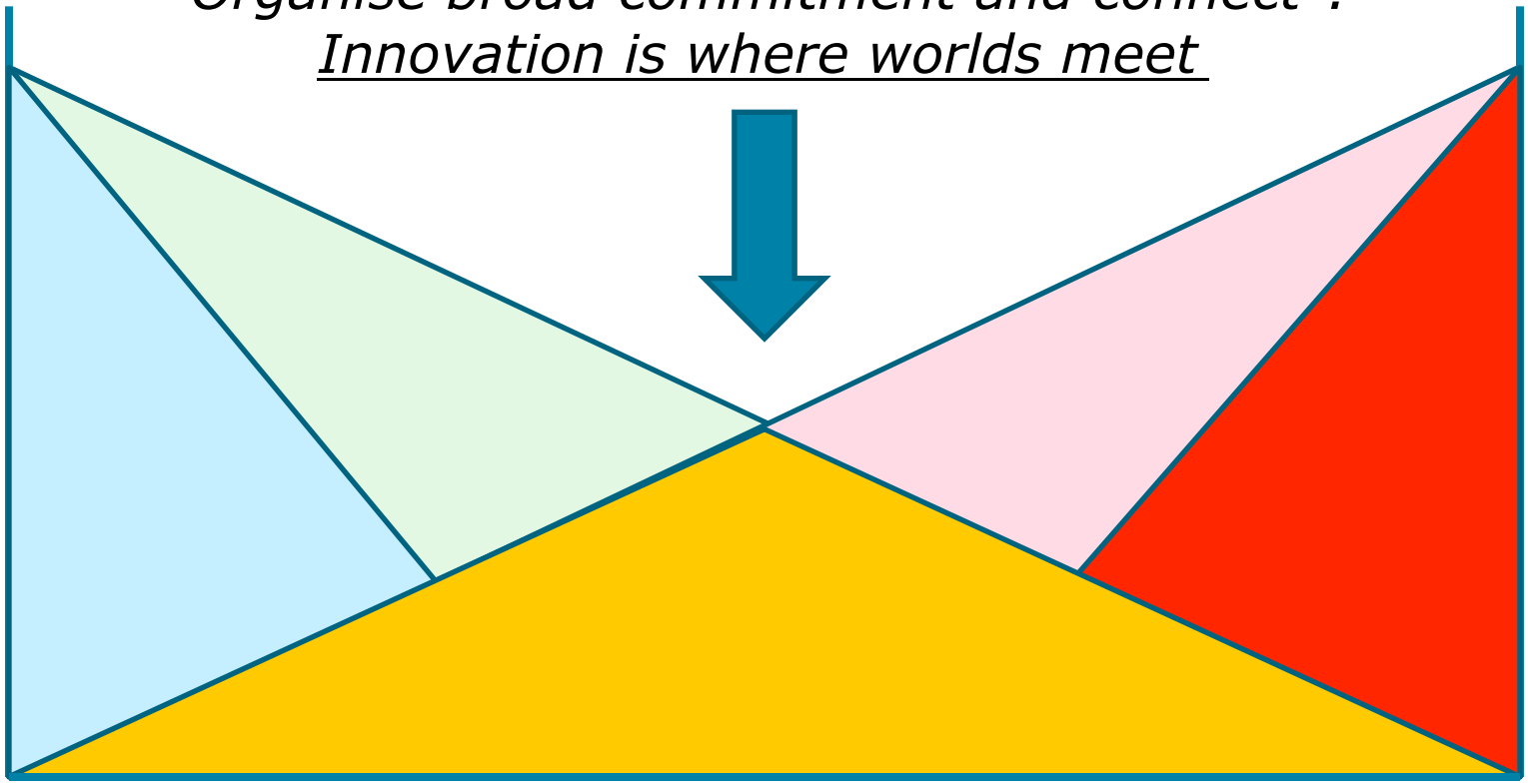
2d layer=spatial measures

1st layer=preventive measures

→ Not a one size fits all solution → custom-made
→ Not The Final Solution → increase adaptivity

} Robust Flexible

"Organise broad commitment and connect":
Innovation is where worlds meet



Layer 1
Prevention

Layer 2
Spatial measures

Layer 3
Prep., evac., recov.

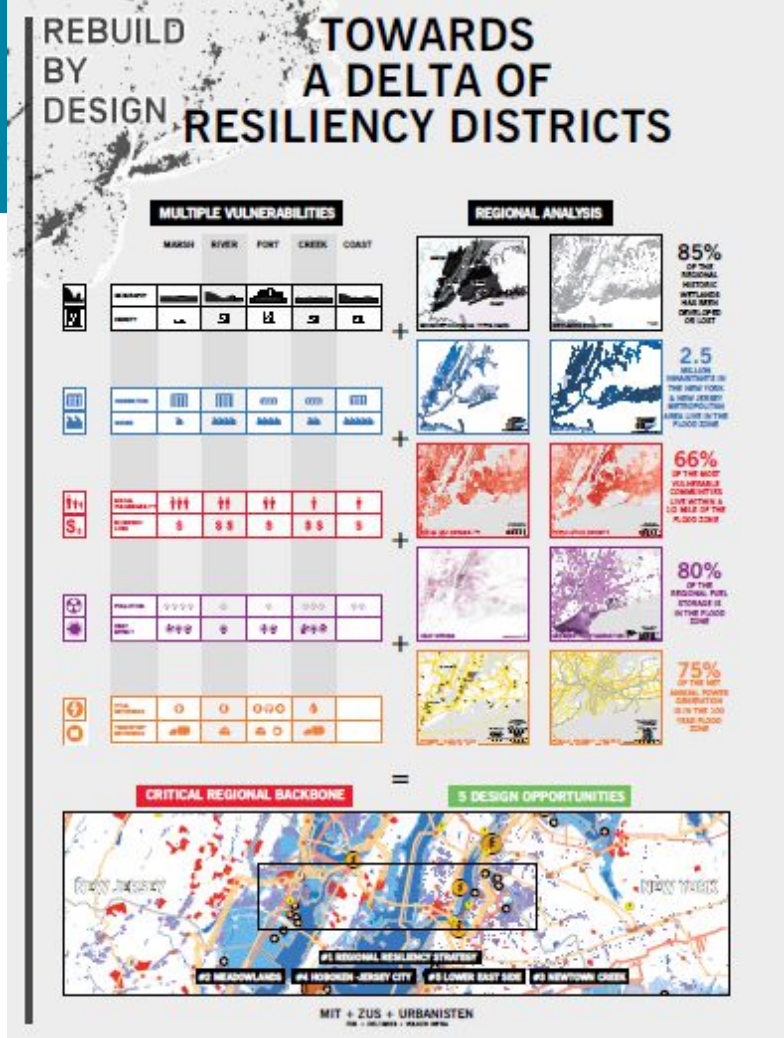
NETHERLANDS → ← **UNITED STATES**

October ‘12 Sandy

Hurr. Sandy Rebuilding taskforce
50 billion USD

January ‘13: NL; Deltares Henk Ovink

June ‘13: The Presidents Climate action plan



June ‘13: HUD-Rockefeller F.
Competition: Rebuild by design: “innovating together to create a resilient region”

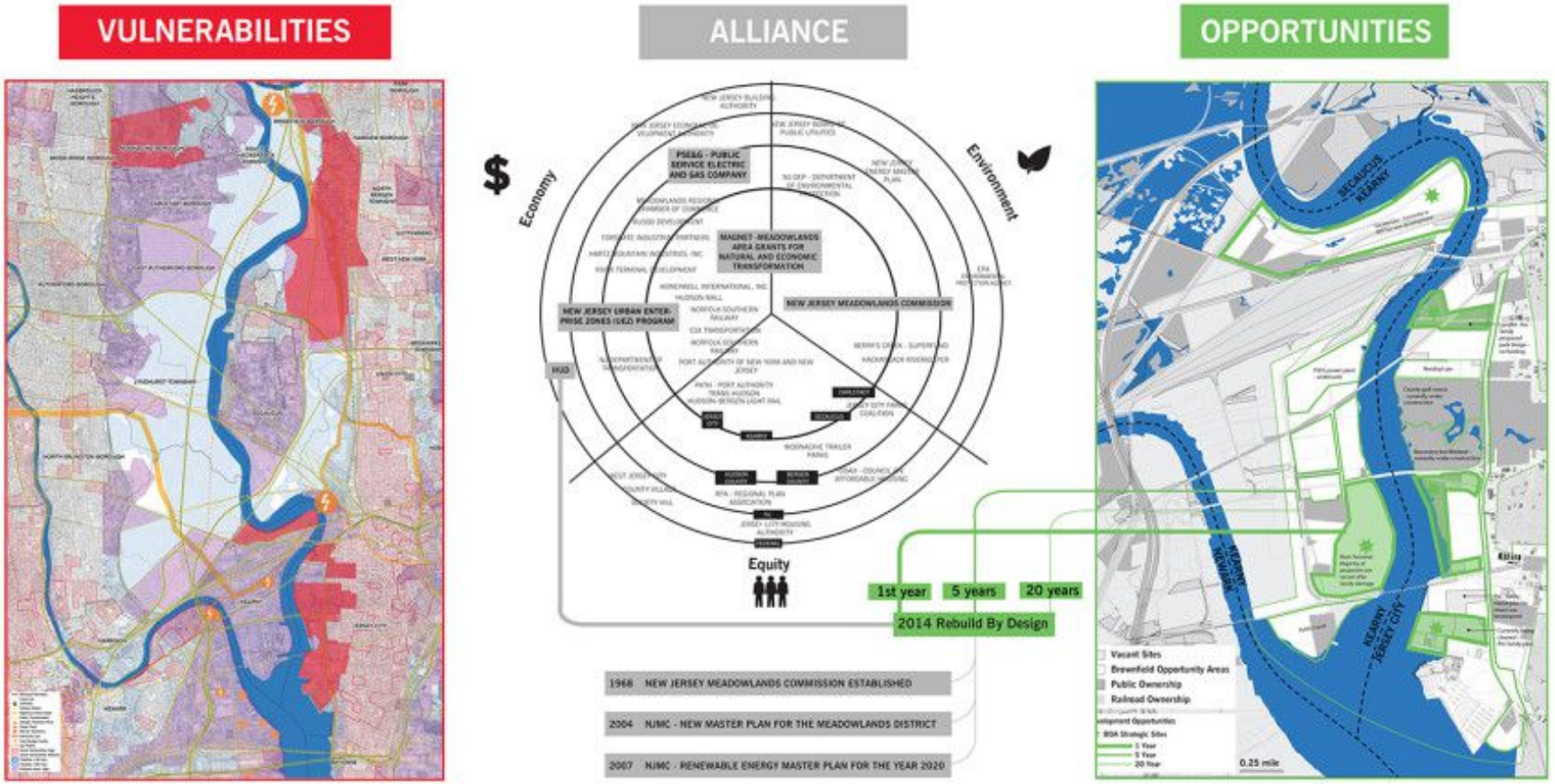
Hurricane Sandy Rebuilding Strategy (aug. ‘13) → “promoting resilient rebuilding through innovative ideas and a thorough understanding of risks”

Rebuild by design

I. Organise: broad commitment
II. Connect: water mngt and landuse /cityplanning

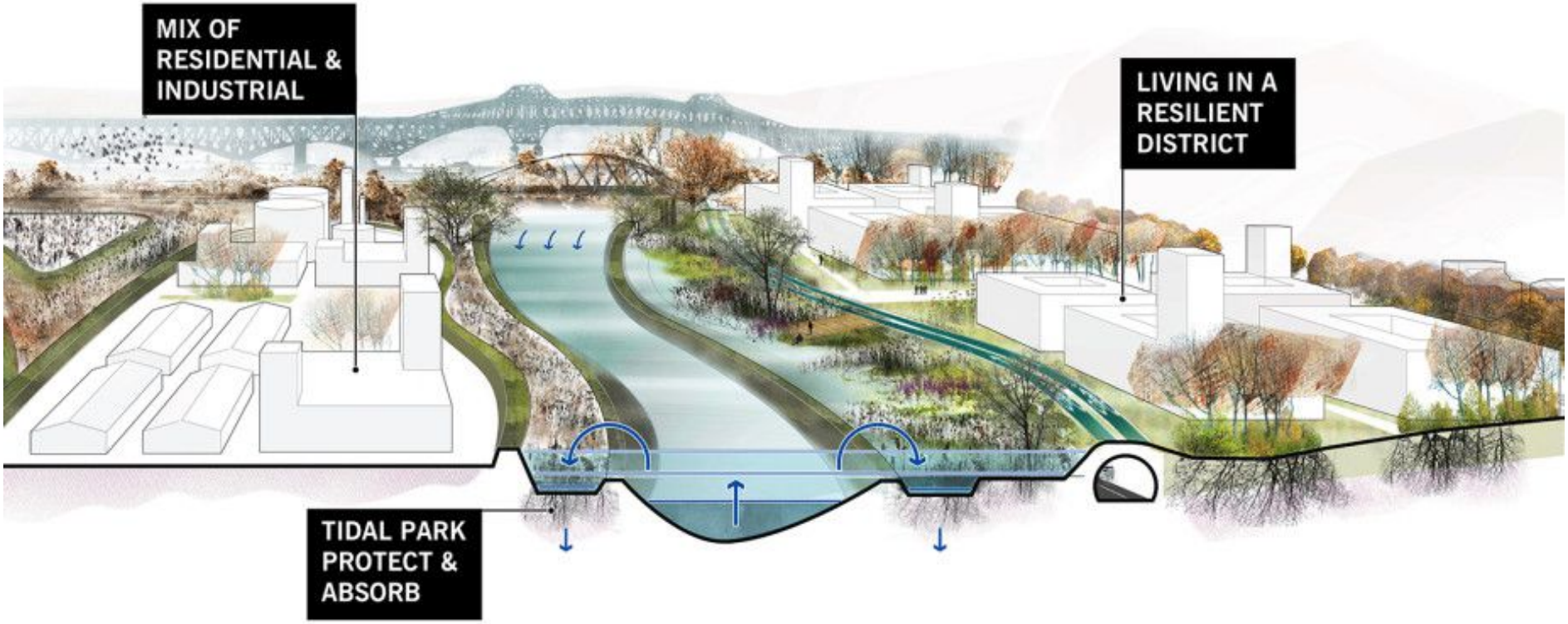
Rebuild by design

I. Organise: broad commitment
II. Connect: water mngt and landuse /cityplanning



Rebuild by design

I. Organise: broad commitment
II. Connect: water mngt and landuse /cityplanning



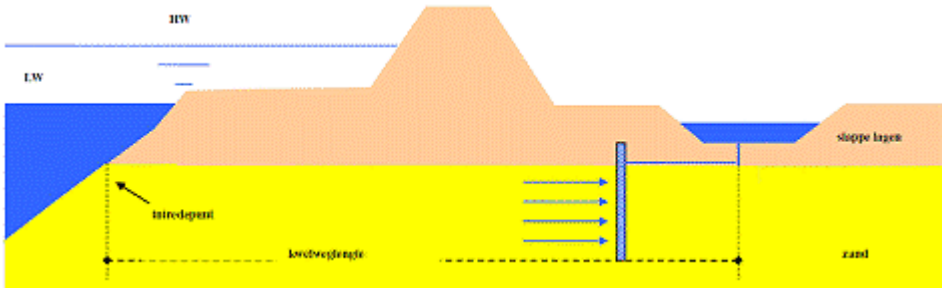
‘Sand motor’ off the coast for watersafety

Some technological innovations increasing flexibility - *lakes*

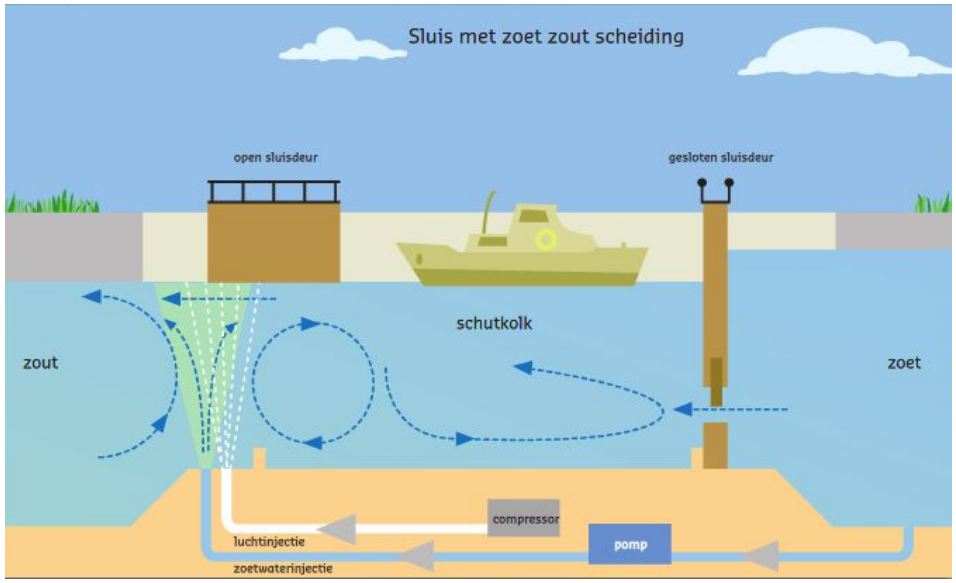
Balgstuw : inflatable dam for situations of extreme high water

Some technological innovations increasing robustness - *rivers*

Geo-textiles in levees to prevent ‘piping’



Bubble curtain to prevent salt intrusion



Some innovations increasing robustness - *freshwater*

First prize winner Climate Adaptation Business Challenge (KvK - november 2013): Arjen de Vos – Zilt Proefbedrijf
Tested on Texel: brackish water resistant potatoe

“How does the Dutch adaptation experience position The Netherlands to deal with future climate risks”

Relatively safe and well equipped

A transition is needed to become more adaptive
(‘towards a more flexible system; prepare for *continuous* adaptation’)

A serious party in the world market of watersafety

Past societies
Eastern Islands
Pitcairn and Henderson Islands
The Anasazi
The Maya
The Vikings
Greenland

Modern societies
Rwanda
Dominican Republic and Haiti
China
Australia

Types of choices crucial in tipping outcomes towards succes or failure:

1. Long term planning

2. Willingness to reconsider core values (a.o. where you live)

→ **We are hoping the first will do**

Thanks for the invitation

Thanks for your attention

Additional challenge # 2: minimize chances of (local) under / over investment

→ Couple long term objectives (watersafety, fresh water supply) with short term decisions (developments / planning in land-use)

→ Consider a wide range of plausible futures; develop several adaptation pathways

→ Develop flexible strategies

→ Maximize added societal value of investments in watersafety and freshwater supply by coupling with other agenda's (aging infrastructure, nature etc.)

Adaptive Delta Management