Flood management in the Netherlands; from protection to adaptation to pro-action

Jean-Marie Stam
Dutch flood management...

Hans Brinker
A classic Dutch adventure

Story by Mary Mapes-Dodge, 1886

Windmill in Steinbach; Canada
From protection to adaptation to pro-action

1. 20 centuries of flood protection

2. Allowing more adaptation:
   Dynamic maintenance of the coast
   and Room for the river

3. Pro-action:
   2008 Second Delta program
60% territory is flood prone
40% is under sea level
70% of GNP
50% of the population lives
From protection to adaptation to pro-action

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The Dutch fight against the water...
1953: The big disaster

Ministry of Infrastructure
50 years of coastal protection
Delta works

- A system of dunes and barriers
- Flooding standards set in law
- 12 yearly monitoring and assessment
- From 1958 to 1996 (40 years)
- Increase of environmental awareness affected Delta works
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2. Allowing more adaptation (in the Dutch context!)
   Dynamic maintenance of the coast line
   Room for the river

3. Pro-action:
   2008 Second Delta program
1990 Dynamic maintenance of the coast line

Heavy storm seasons and costly reparation of dunes
Need for a more structural, proactive approach

Three possible options for the coastline:
- Retreat
- Maintain
- Expand

Parliamentary decision: maintain the coastline at the 1990 position
1990 Dynamic maintenance of the coast line

“Hard where necessary; soft where possible”
Flexible and effective

Method
- 1990 is the reference coastline
- Determine volume of sand on shore
- Determine erosion trends
- Sand nourishments where erosion is structural
Near floods and evacuations in 1993 and 1995
More than 30 Room for the River measures
Room for the river; types of measures

1. Lowering of floodplains
2. Removal of obstacles
3. Dyke relocation
4. Water retention and storage
5. By-pass
6. Height reduction of groynes
7. Deepening of summer bed
8. Heightening of dykes
9. Dyke improvement
Room for the River: Nijmegen

Nijmegen old situation

Nijmegen new situation
Room for the River: Overdiep
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Climate change
Strategy for long term future

Three themes:
• Flood protection
• Sustainability
• Spatial adaptation

No disaster to launch it!
Multi-level safety

Stage 3: crisis management

Stage 2: Spatial development

Stage 1: Dikes

But all of it in the Dutch context....
2008: Some examples of creative adaptation

Naaldwijk: Floating greenhouses

Overdiep: houses on terps

Hook of Holland: sand motor

Katwijk: parking in dune
Our conclusions

• Flood protection is a balance of “hard” and “soft” measures (i.e. dykes, barriers but also sand and room for the river)

• “Hard” measures (e.g. barriers) take decades to complete: a flexible approach is necessary to adapt to societal changes

• Twenty centuries of flood protection has created a paradox: high protection level but low awareness of risk of flooding

• But learning from other countries helps us leave this paradox
THANK YOU!