Royal HaskoningDHV
Enhancing Society Together

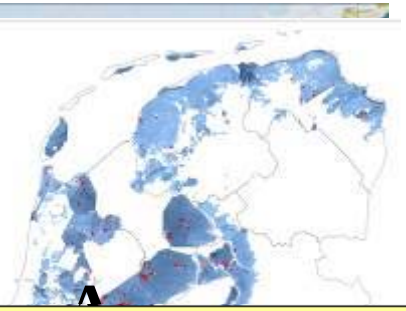
Deltacommissaris

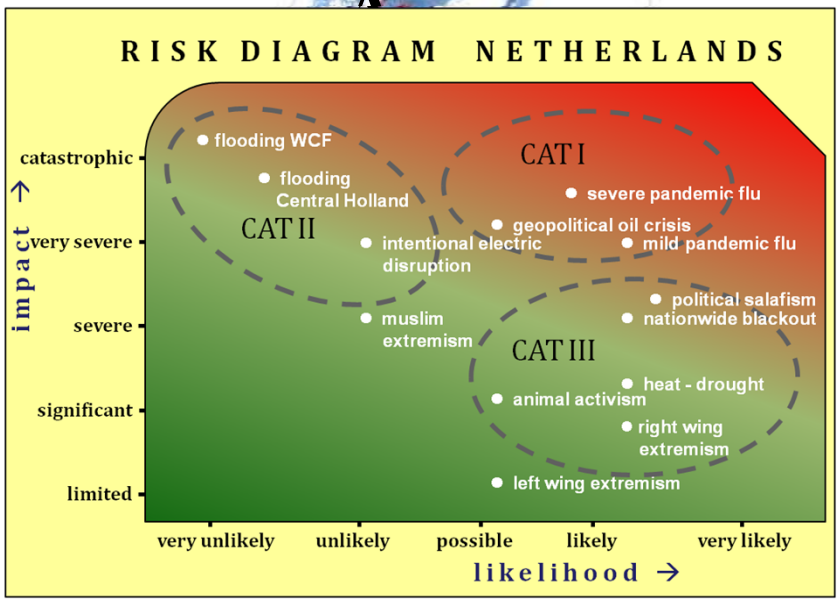

# Adaptive approaches to reduce flood risk:

## examples from the Netherlands and Vietnam

Jos van Alphen
Michel Tonneijck
21 May 2013

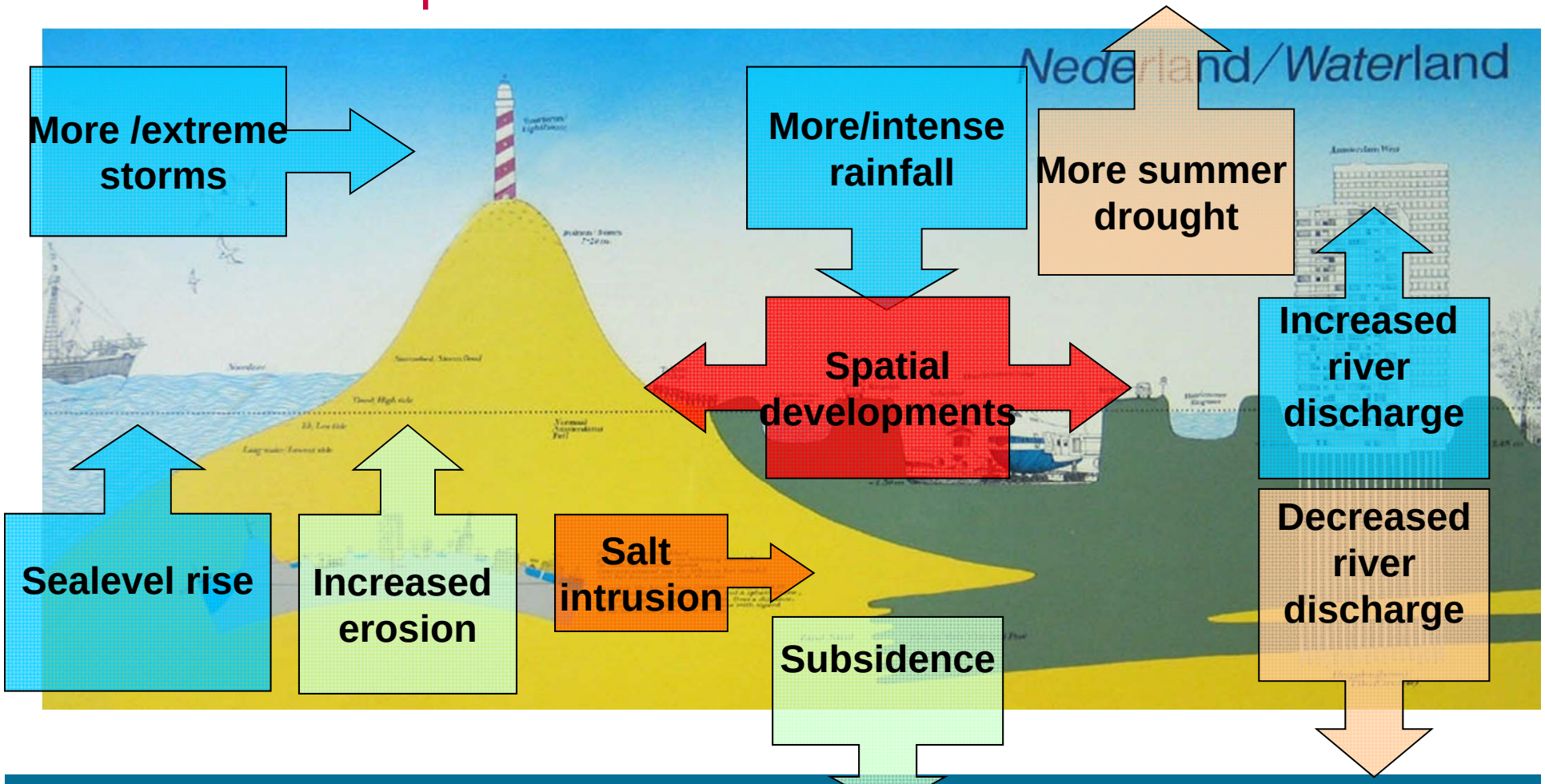
# 1 The Netherlands' exposure profile

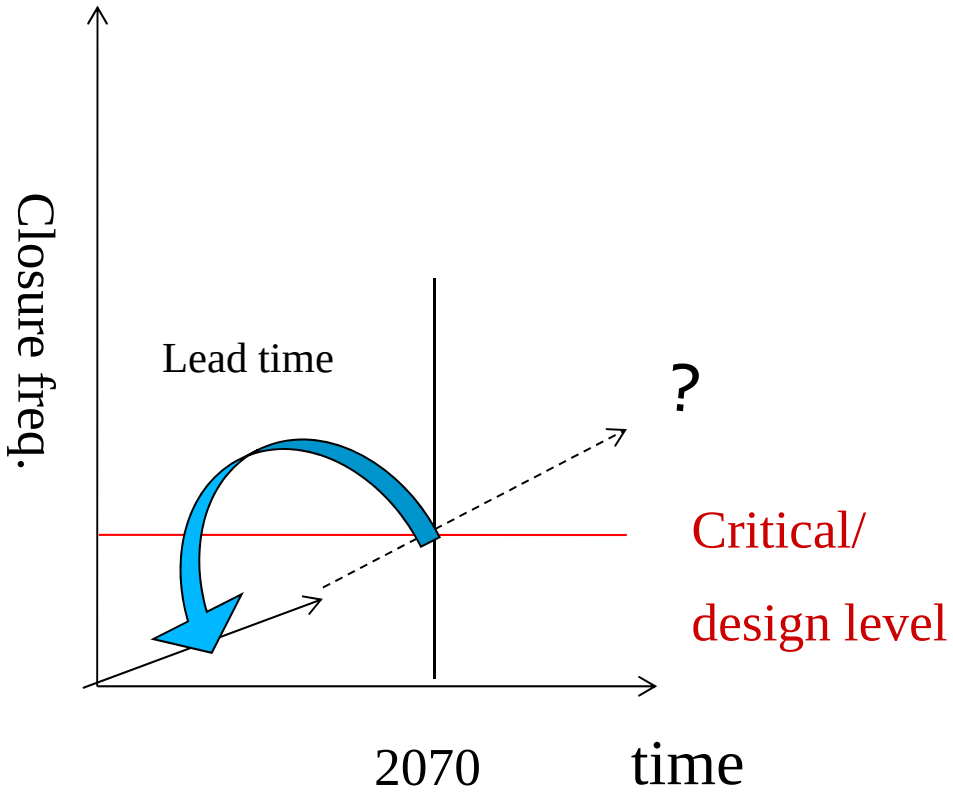



- About 400 km of Rhine river
- International catchment
- 60% flood prone
- About 9 million inhabitants below flood level
- GDP 600 bln euro
- High protection level
- 3500 km of flood defences, hundreds of locks, sluices, pumping stations
- Flood is major (catastrophic) risk

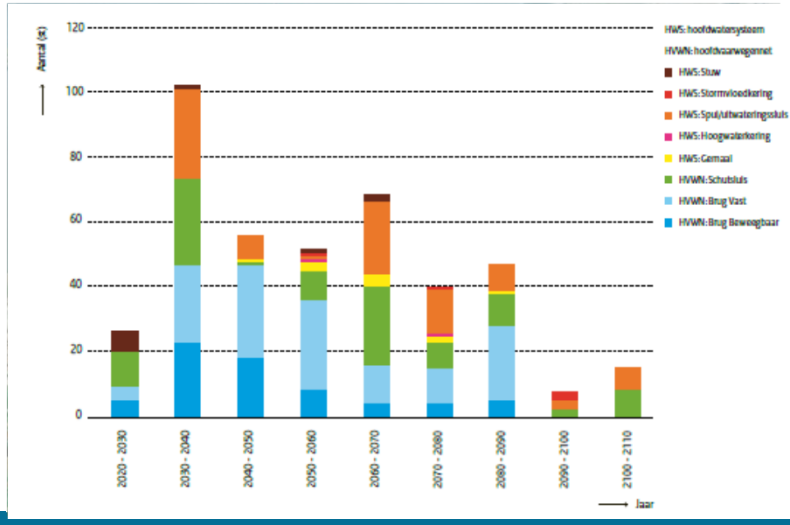
# Delta under pressure



# Investments in an uncertain future




- Maintenance of flood defences
- Replacement of aging infrastructure
- Construction new infrastructure
- Urban developments



# Delta Programme


One Aim:

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

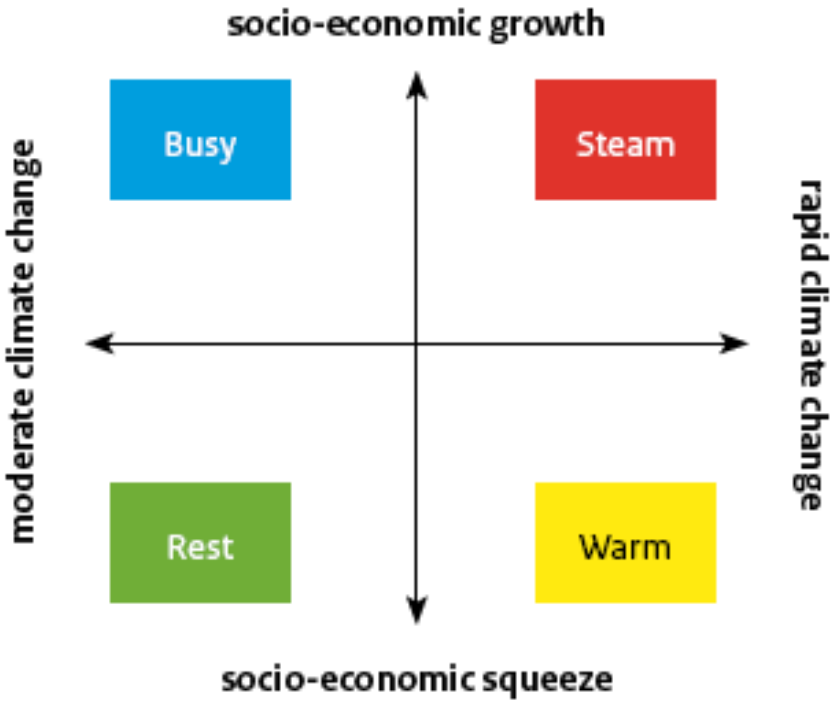
Two Goals

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

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

- Make planned developments future proof
- Decide on new developments in uncertainty
  - → Scenario's
  - → Adaptive strategies
  - → Multi-governmental approach
  - → Institutional arrangements

# Uncertain future → 4 Delta scenario's




- Climate change
  - sea level rise (35-85 cm/100y),
  - discharge,
  - rainfall,
  - precipitation)
- Socio-economic developments
  - population,
  - economy,
  - land use/urban development
  - fresh water demand

# Adaptive strategies:

Balance between
"too early, too much" and
"too late, too little"

- Connect short term decisions (in physical domain) with long term water challenges
- Link with (short term) investment agenda's ("aging infrastructure")
- Able to speed up or slow down, or flexible to change to another strategy ("building with nature")

→ "No regret", avoid "lock in"

→ Spatial reservations for
  - future levee enforcements,
  - water discharge and storage
  - sand extraction

# Multi-level governance

In order to:

- Collect creative and innovative ideas
- Combine with local developments (→"synergy")
- Involve local stakeholders and built acceptance

Supervised by Delta Program Commissioner

- progress, uniformity, coherence

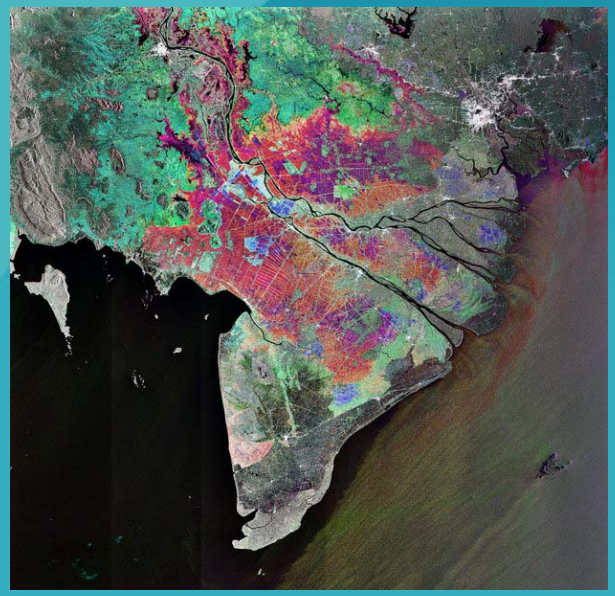
# Prerequisites for future-proof implementation

- Delta Program: measures, yearly update, presented to Parliament
- Delta Decisions (strategic, 2015: policy objectives and frameworks, coherent set of regional visions)
- Delta Commissioner,

  supervising coherence and adequate (regional) multi-governmental implementation
- Delta Fund, 1.0 bln € / yr
- Delta Act, legal “anchoring” Delta-commissioner, program and fund

# Mekong Deltaplan

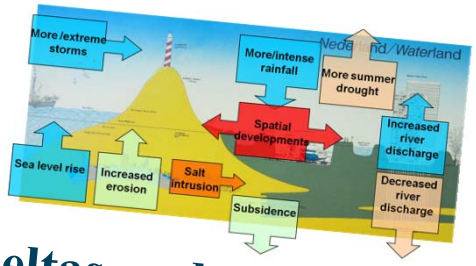
## Long-term approach for delta management in Vietnam



**Michel Tonneijck**
**team leader Dutch consortium**

**Global Platform DRR 21 May 2013**

# Delta management principles transferred




deltas under pressure


master plan 1993

## 2009-2013 Mekong Deltaplan

- former Dutch Minister of Agriculture advisor to Prime Minister Vietnam
- Vietnamese ownership
- Strategic Dutch-Viet Partnership
  - climate change adaptation
  - flood safety
  - food and natural systems
  - water supply, wastewater, sanitation
  - water related governance

# integration embedded in project organisation for Mekong Deltaplan

streering

(vice) prime minister

vice ministers sector ministries

work unit VN experts
- physical system
- land use
- climate
- governance

advising

Dutch ministries

work unit Dutch experts
- physical system
- land use
- climate
- governance

# Mekong Delta and its vulnerabilities (1)

## climate change

- sea level rise (in *2050 ± 30 cm in 2100 65-100 cm)*
- higher floods (+20%)
- longer droughts (-20%), salinity

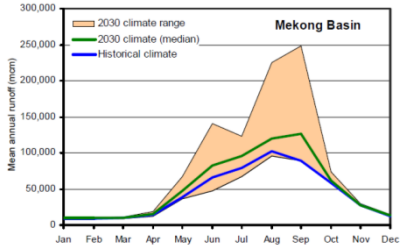
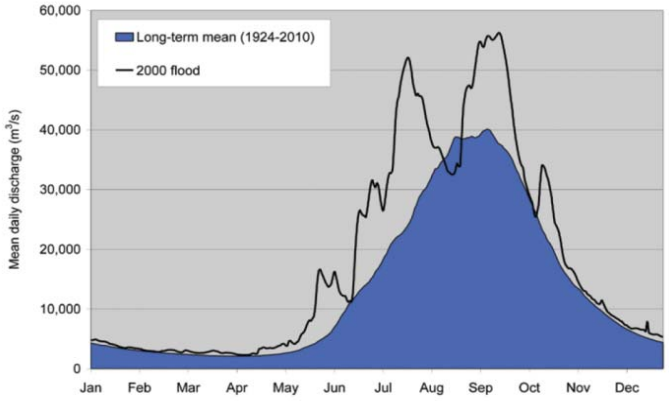



Figure 1. Historical (1951-2000) and future (2030) monthly runoff

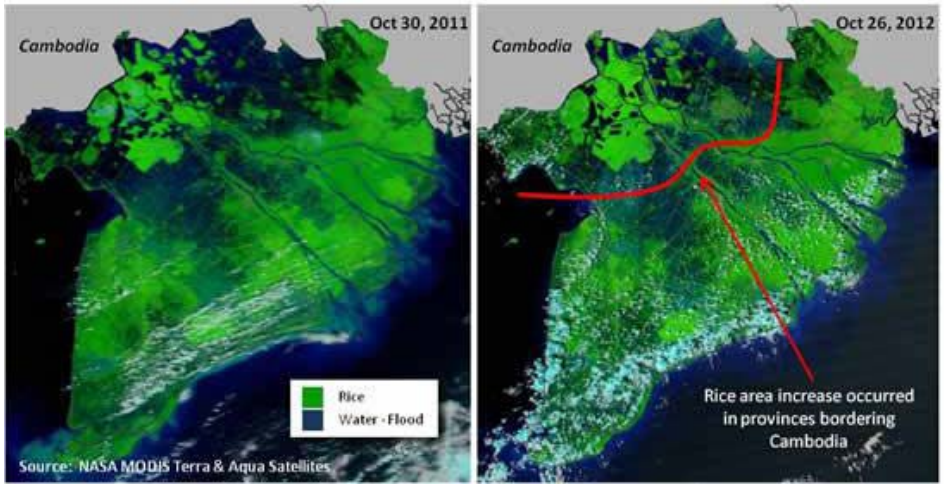
## upstream/international

- dams in mainstream and contributories
- deforestation

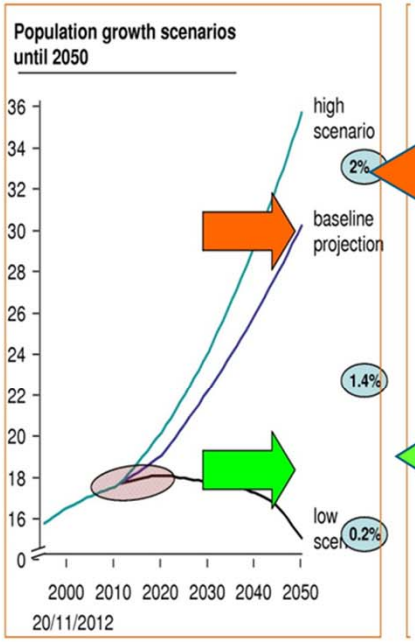


# Mekong Delta and its vulnerabilities (2)

- land use, spatial development
- growing population, employment (17 ↗ 30 million?)
- GDP lagging behind other regions
- migration to HCMC and other regions
- industry ousts fertile areas (HCMC – CanTho-corridor)
- transport mainly on water
- unsustainable agri/aquaculture
- triple crop prohibits flood retention
- fresh water shortages (Ca Mau!)
- salinity in coastal regions
- loss of mangrove coastal protections



# Potential development scenarios




jobs for 30 million people
industrialisation, urbanisation

Agro Business Specialisation

1. competiveness of Mekong Delta (industry based or agriculture based)
2. expenses on flood defence

# views on development in Mekong Deltaplan

## favourable development scenario

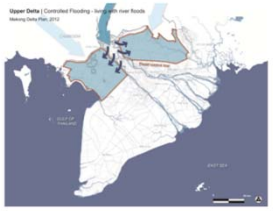
- pursue agro business (move forward)
  (can be influenced)
- combine with climate change scenarios
  (virtually no influence)
- upstream developments
  (requires good negotiation/cooperation)

## sustainability in delta's agricultural base

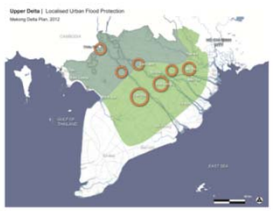
- from food security to food quality (move forward)
- from triple crop to rice/fish combination, allowing controlled flooding (adaptation)
- follow the salinity (adaptation)
- from single shrimp farms to four step fish-fish-shrimp-mangrove (move forward, restoration)

# Can major hydraulic measures be avoided?
## time scale 20 – 100 years

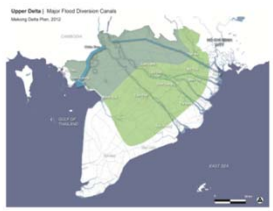
**Controlled Flooding**
*Reduce downstream flooding risk*



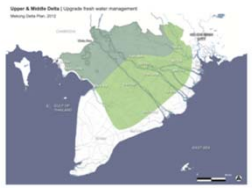
**Urban Flood Protection**
*Increase Safety and Sanitation*



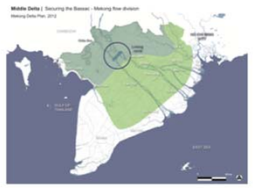
**Diversion Canals**
*Limit downstream investments*



**Water Management**
*Fresh Water*



**Bassac Link Canal**
*Assure fresh water West Delta*

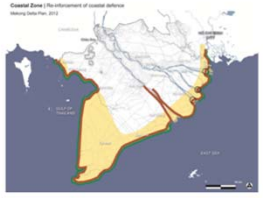


**Closing River Branches**
*Assure fresh water East Delta*

**Dual Zone Management**
*Go for Brackish Economy*

**Water Management**
*Alternative fresh water supply*

**Coastal Defense**
*Better Safety*



**We don't think so**

- Whole Delta is very vulnerable
- Rising prosperity implies higher protection
- Upper Delta: maintain seasonal flooding and create extra discharge
- Middle Delta: more dykes, fresh surface water supply
- Coastal Zone: closing river branches, improvement coastal protection

# Implications

- enforcement of spatial management required
- decision making across provincial borders
- adjustment of existing sectoral master plans and simultaneously continuation of flood protection measures (balancing room for river and dyking)
- reinforcement of investigation, research, pilots in new agricultural approach, water management issues
- financial arrangement for major investments in water infrastructure


**www.mekongdeltacommission.vn?**

**www.deltacommissaris.nl**