



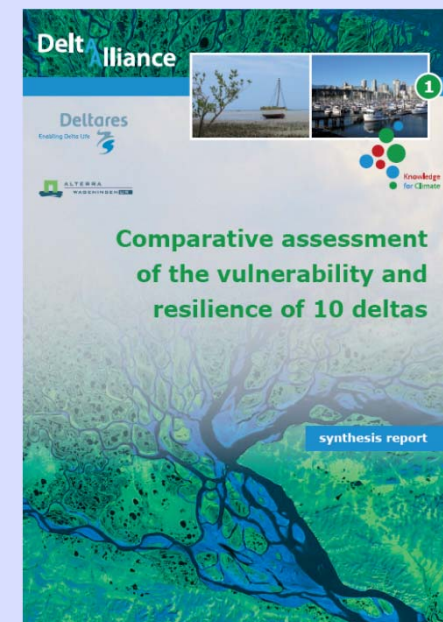
Delta Alliance - for the resilience of deltas worldwide

Comparative Assessment of the Vulnerability and Resilience of 10 Deltas

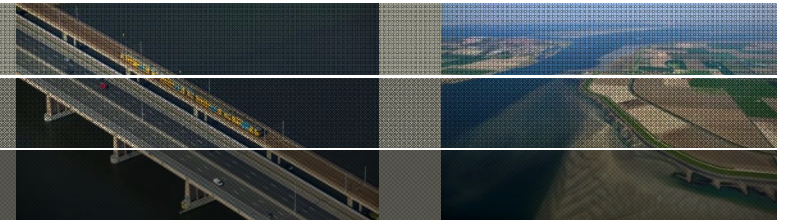
Cees van de Guchte

The Netherlands

UNFCCC, 18-20 July 2012, Mexico-City



More attention for deltas



River deltas are **valuable**:

provide food to the world
underpin economies
sustain biodiversity
home to many people

River deltas are **vulnerable**:

pollution
urbanization
flooding and drought
land subsidence and erosion
overall loss of environmental quality

And pressures are **increasing**:

economic growth
population growth
climate change

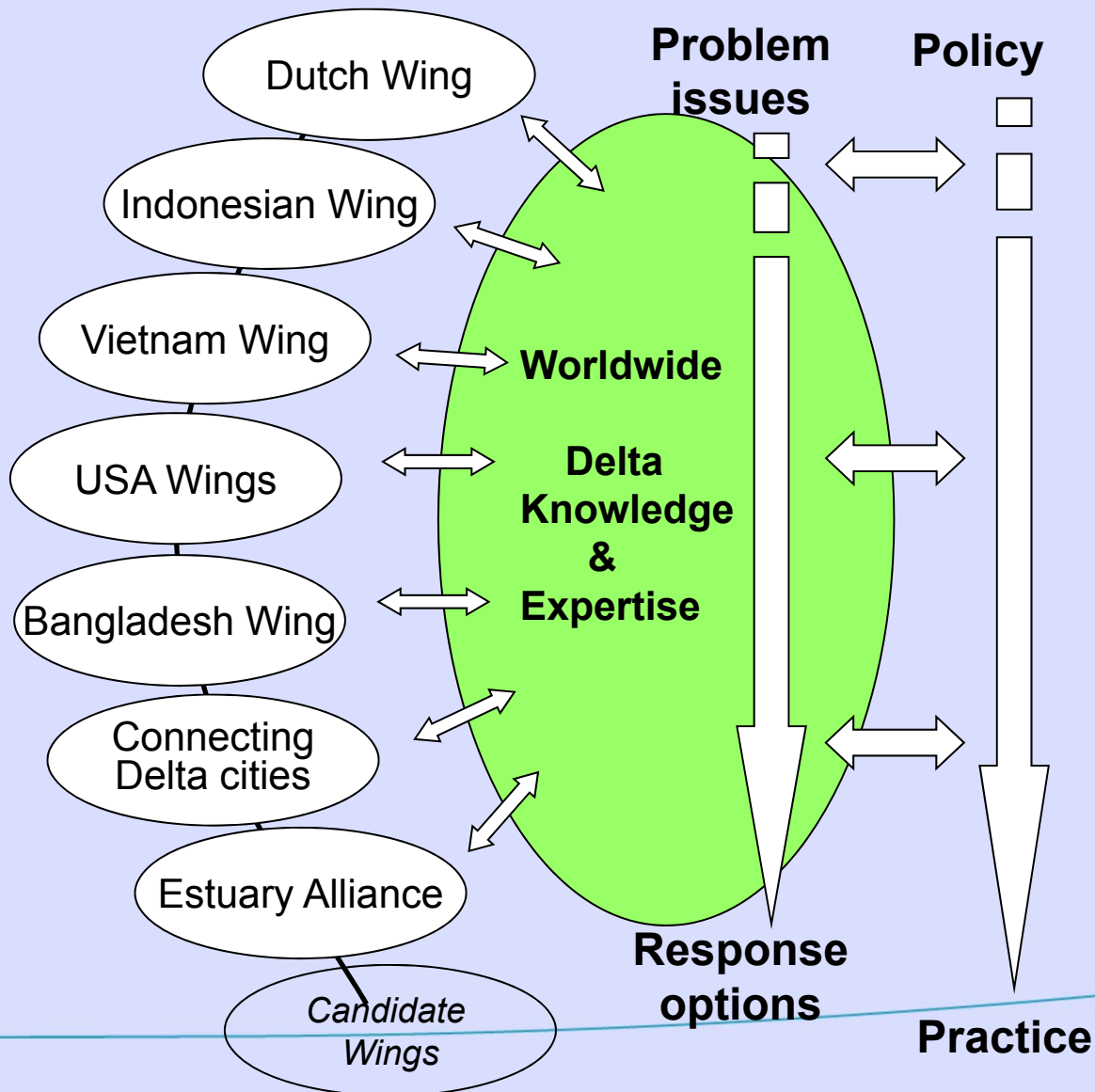
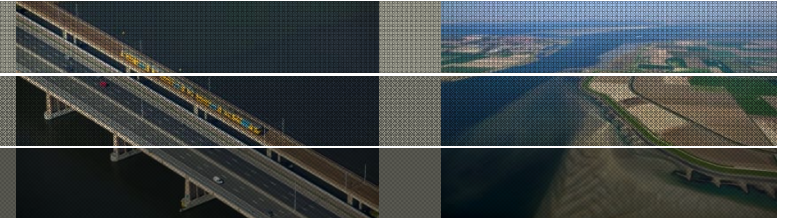


Vulnerable deltas



Figure C3.1. Relative vulnerability of coastal deltas as shown by the indicative population potentially displaced by current sea-level trends to 2050 (Extreme = >1 million; High = 1 million to 50,000; Medium = 50,000 to 5,000; following Ericson et al., 2006).

Delta Alliance Global Network

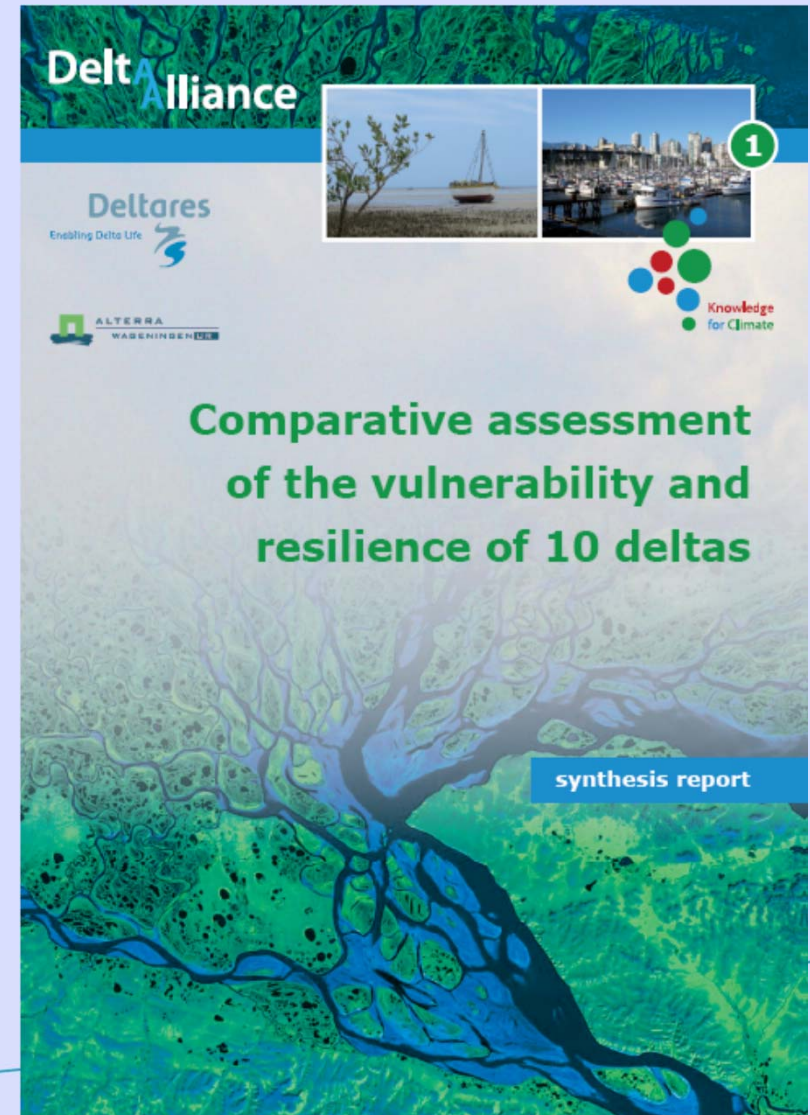


Delta Alliance Activities

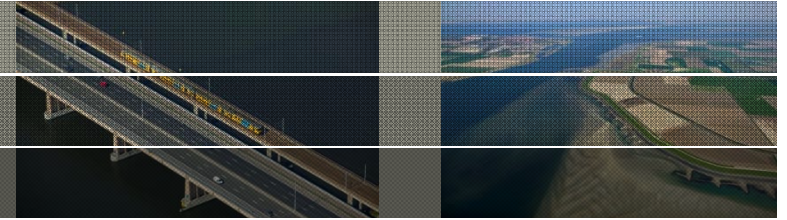
1. Stimulate collaborative projects
 - Joint projects at national level
 - Joint projects at international level
 - Demonstration projects
2. Events
 - International conferences
 - Workshops, seminars
 - Study tours, courses
3. Web based Information services
 - Profile of deltas
 - Overview of Delta projects
 - Overview of research + gaps
 - Network member info

Comparative assessment of the vulnerability and resilience of 10 deltas

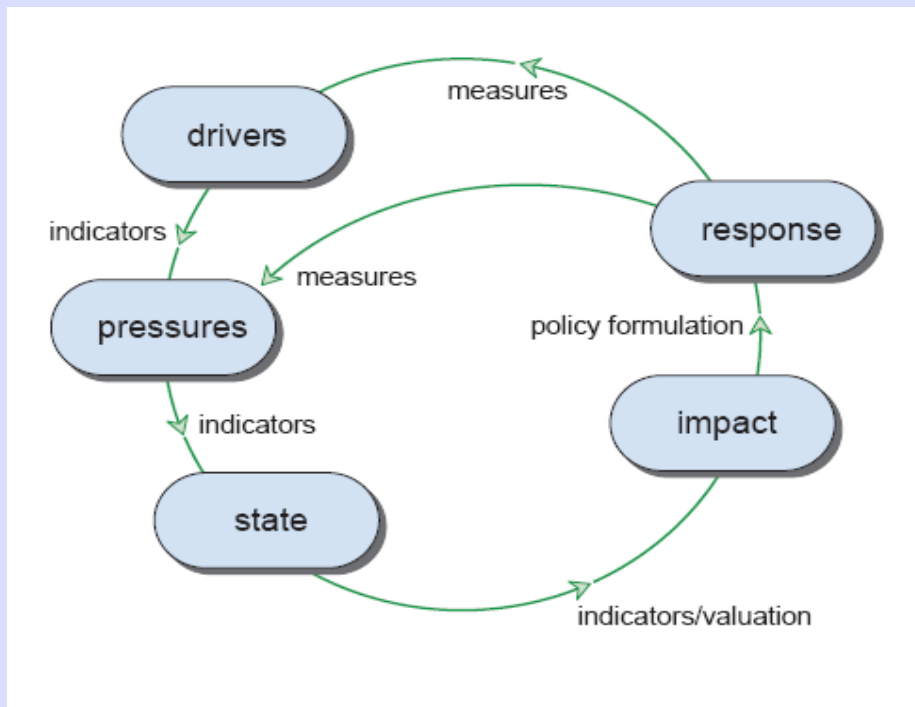
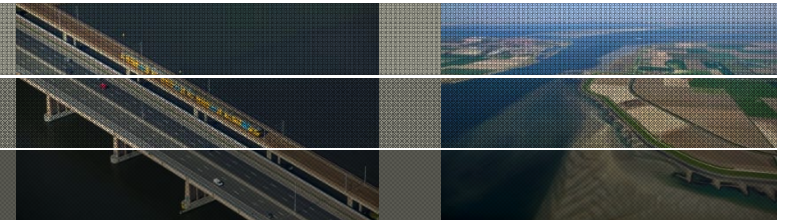
- Provide a first step towards a comprehensive overview of the current and future state of deltas
- Integrate scientific, social and management knowledge
- Provide framework for future data collection



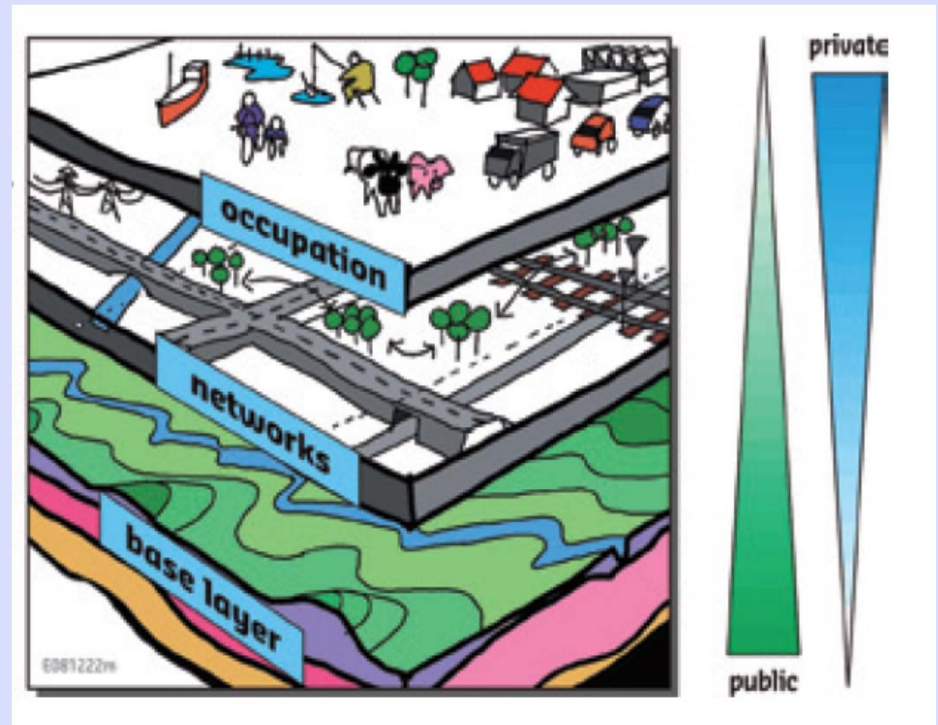
Deltas studied



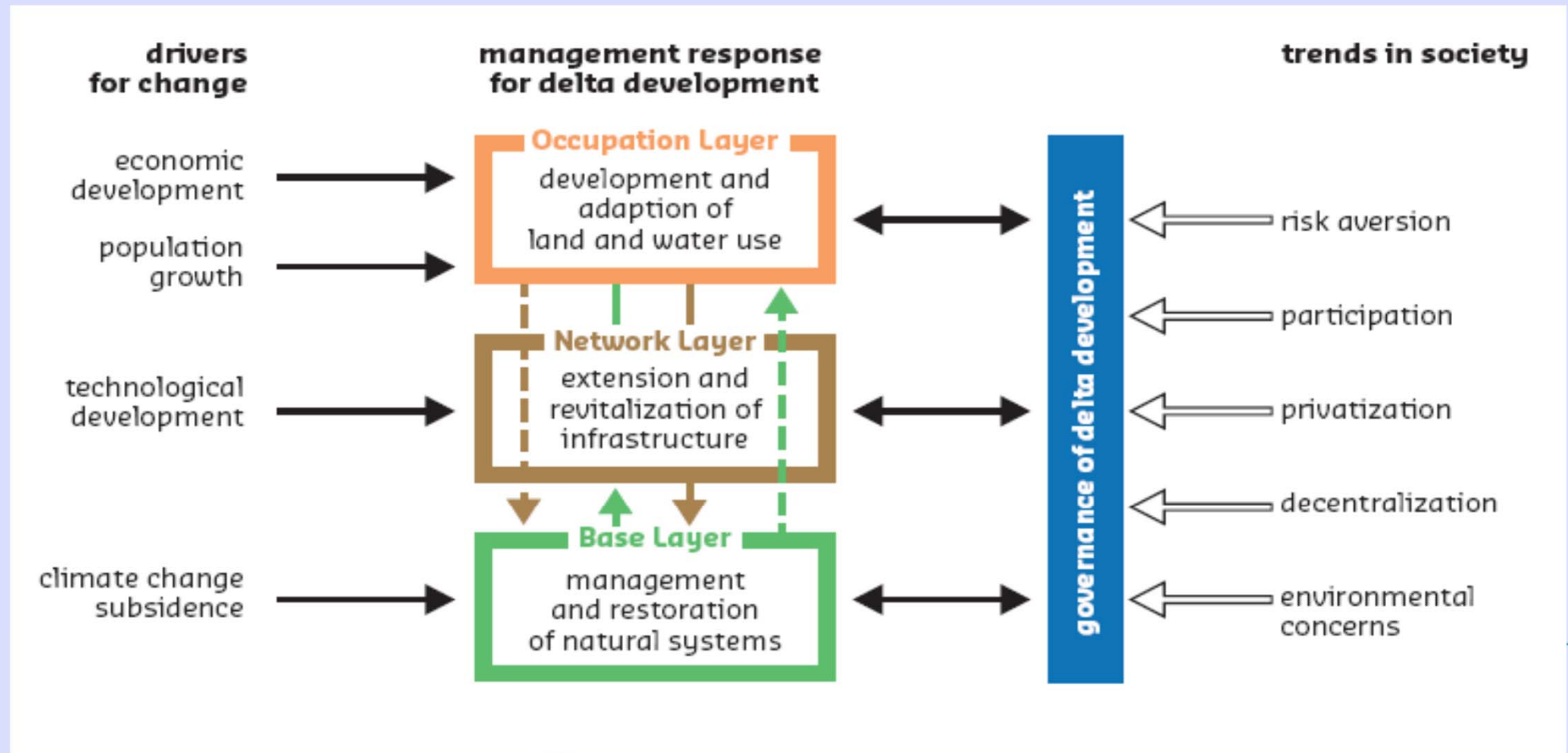
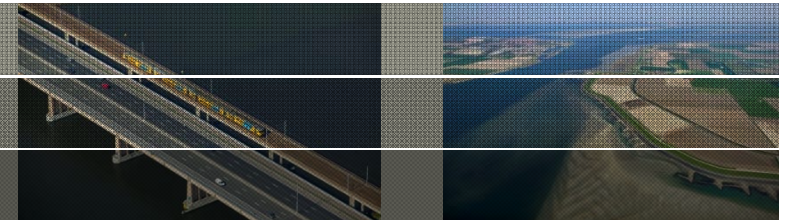
DPSIR + Spatial layers approach



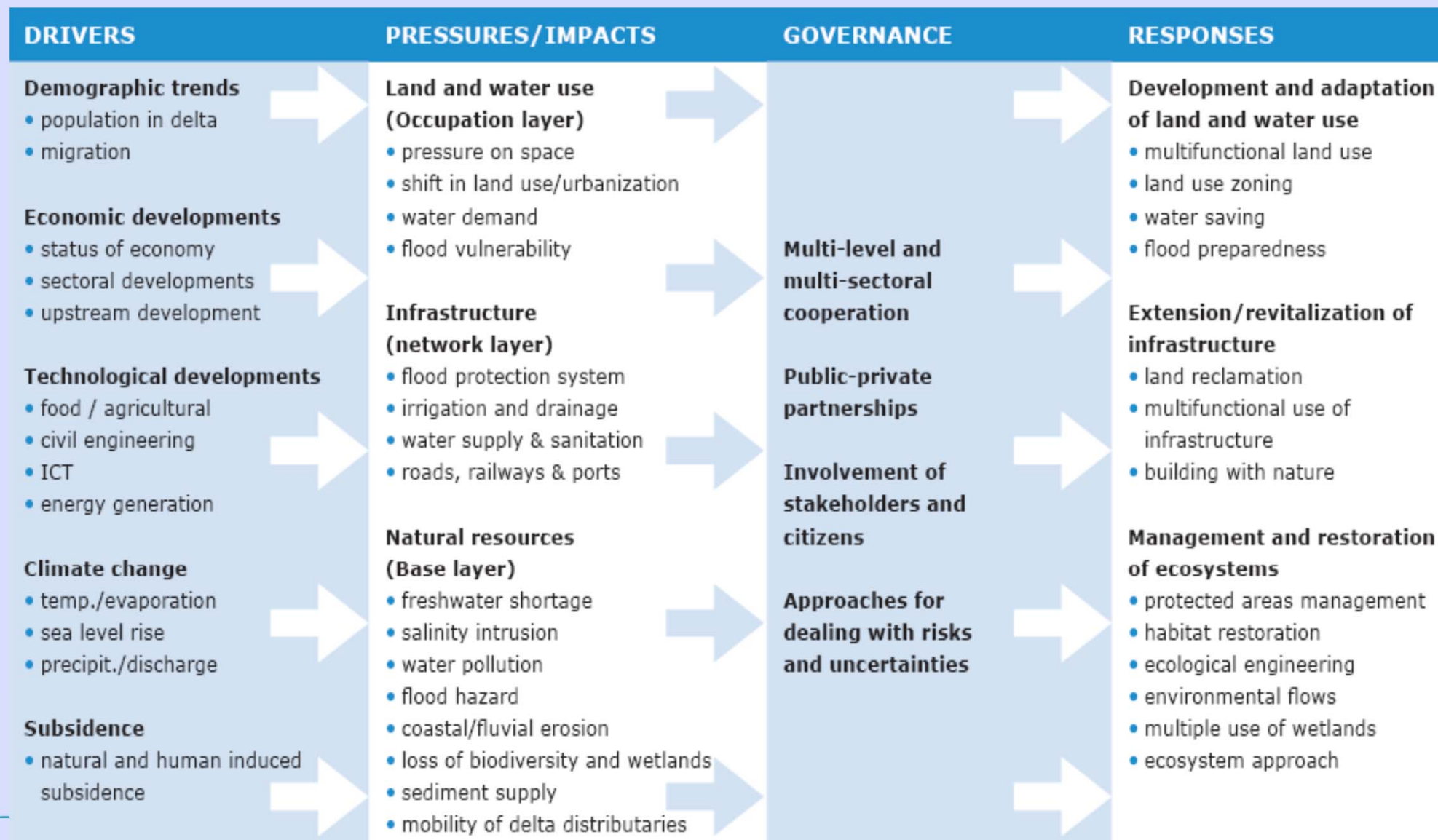
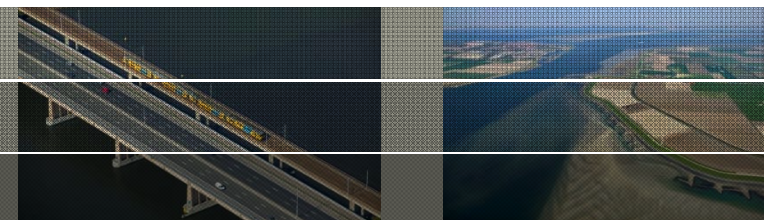
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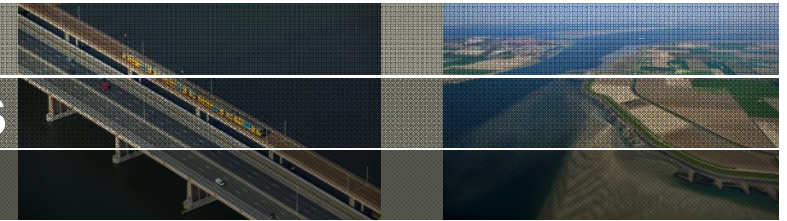
Framework for assessment



Towards indicators of change



Scorecard and related indicators



Land and water use (occupation layer)	Infra-structure (network layer)	Natural Resources (base layer)	Governance	Resilience & Sustainability Indicator		
				Current	Moderate Scenario	Extreme scenario
+	++	0	+	+	0	-

Performance criteria (Occupation Layer)

Pressure on space

Water demand

Flood vulnerability

••

•

••

Main indicators: Pressures

Land and water use (occupation layer)

- Population density
- Urbanization

- 500/km²
- High

Comparative overview of delta score cards

	Land and water use (occupation layer)	Infra-structure (network layer)	Natural Resources (base layer)	Governance	Resilience & Sustainability Indicator		
					Current	Moderate Scenario	Extreme scenario
Nile delta	--	0	-	0	-	-	--
Incomati delta	0	-	-	-	-	-	--
Ganges-Brahmaputra-Meghna delta	--	--	--	0	--	-	--
Yangtze delta	-	+	-	0	0	0	--
Ciliwung delta	--	--	--	-	--	--	-
Mekong delta	0	0	-	0	0	+	0
Rhine-Meuse delta	+	++	0	+	+	0	-
Danube delta	+	+	+	0	+	0	0
California Bay-Delta	0	-	-	0	-	0	-
Mississippi River Delta	0	0	-	0	-	0	-

Resilience / sustainability: ++ (very good), + (good), 0 (medium), - (low), -- (very low)

Comparative overview of delta score cards - Conclusions



For most of the deltas current resilience and sustainability is not satisfactory

Reasons differ per delta but some general mechanisms:

- **Imbalance between demands and supply with regard to land and water use;**
- **Inadequate or ageing infrastructure in the delta;**
- **Disruption of the natural delta processes;**
- **Inadequate governance to address problems and implement solutions.**

For a number of deltas the challenge is

to define a comprehensive (multi-sectoral) delta plan

The combined DPSIR-layer approach has proven to be useful



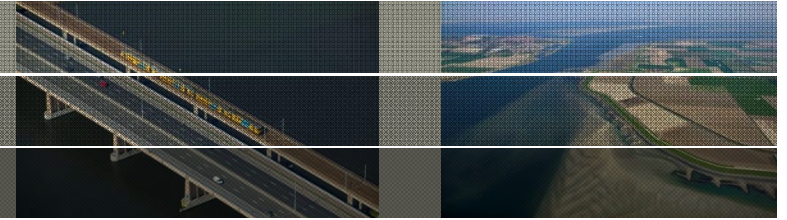
Potential for collaboration across deltas

deltas	issues					
	pressure on space	flood vulnerability	freshwater shortage	ageing or inadequate infrastructure	coastal erosion	loss of environmental quality and biodiversity
Yellow River Delta (China)	••	•	••	•	•••	•••
Mekong River Delta (Vietnam)	••	••••	••••	••	•	•••
Ganges–Brahmaputra Delta (Bangladesh)	••••	••••	••	••	••••	••••
Ciliwung River Delta (Indonesia)	••••	••••	••	••	•	••••
Nile River Delta (Egypt)	••••	•	••••	••••	••	••
Rhine River Delta (The Netherlands)	•••	••	••	•••	••	•
Mississippi River Delta (USA)	•	••••	•	••••	••••	••••
California Bay (USA)	••	••••	••••	•••	•	•••

Legend:

- relatively minor problem, now and in the near future
- currently a minor problem, but is likely to increase in the near future
- currently already a big problem, future trend uncertain
- currently already a big problem, likely to increase in the near future

Vulnerability and Resilience of 10 Deltas



THANK YOU

➤ www.delta-alliance.org

- Background information
- Research gaps identified per delta
- Adaptive measures identified

Documents to download:

- Synthesis report
- Working document
(with full delta descriptions)

