Risk- Sensitive Land Management and Governance

UMTCC Short Course, IHS

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IHS
Making cities work

Key Propositions

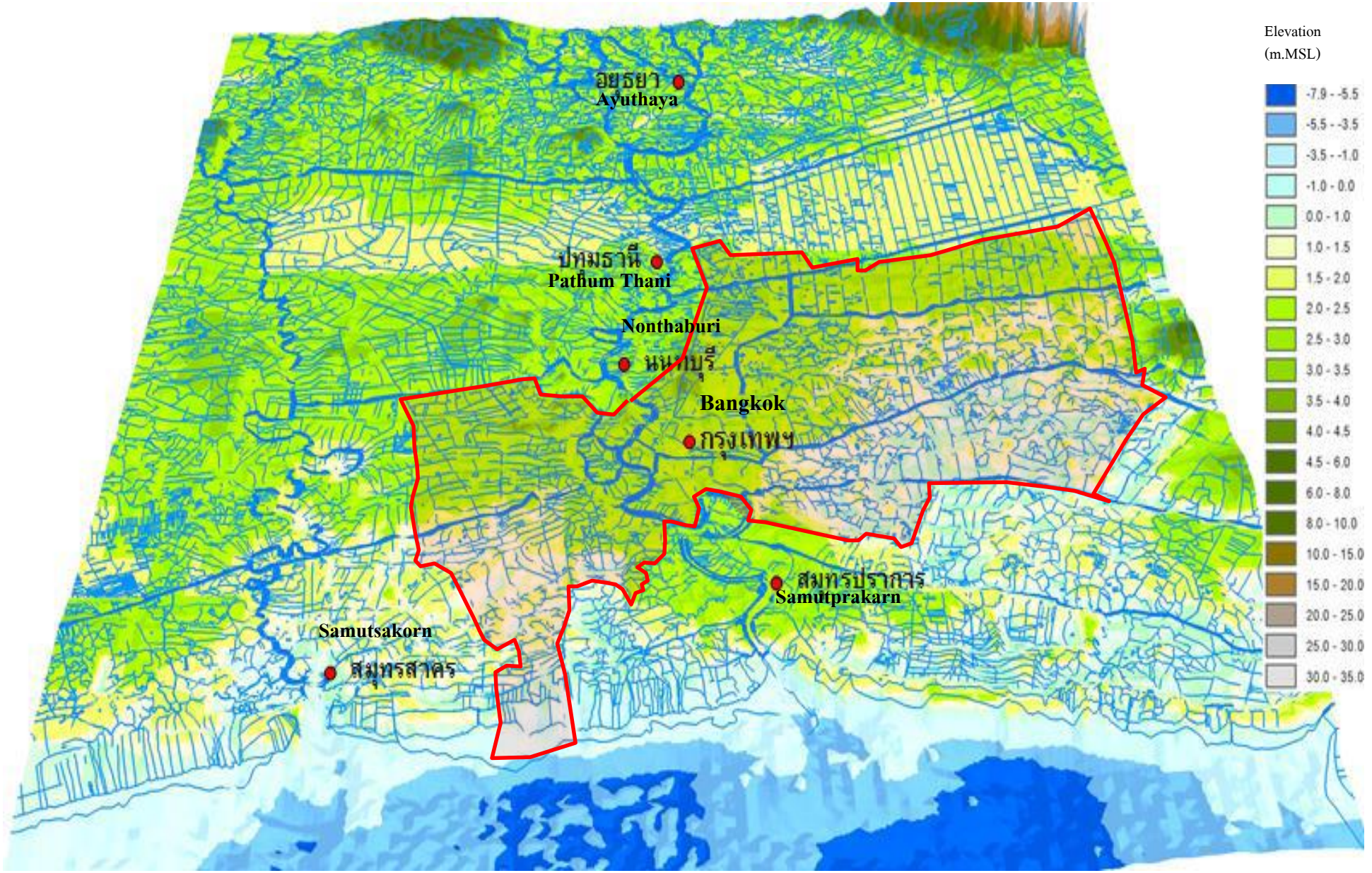
1. Land development is the **number 1 source of risk** – in both urban and rural areas
2. Climate change exacerbates this risk
3. Our collective knowledge and approaches to deal with these forms of risk have been insufficient – and slow to adapt
4. Key ingredients of a **new form of knowledge**:
   - Nature-based solutions
   - More broad-based governance
   - More progressive land governance for a more sustainable development

Focus of session: flood risk and the land-water nexus

Session outline:

1	Mapping the problem: examples from delta cities
2	Governance dimensions
3	Looking at solutions: Room for the River program (Netherlands)
4	Discussion focused on “learning”

Topic 1: Examples from delta cities and river systems



Bangkok, Thailand. Source: BMA

Source: *Unseen Siam*

Bangkok in the late 19th century: an example of traditional "resilience"?

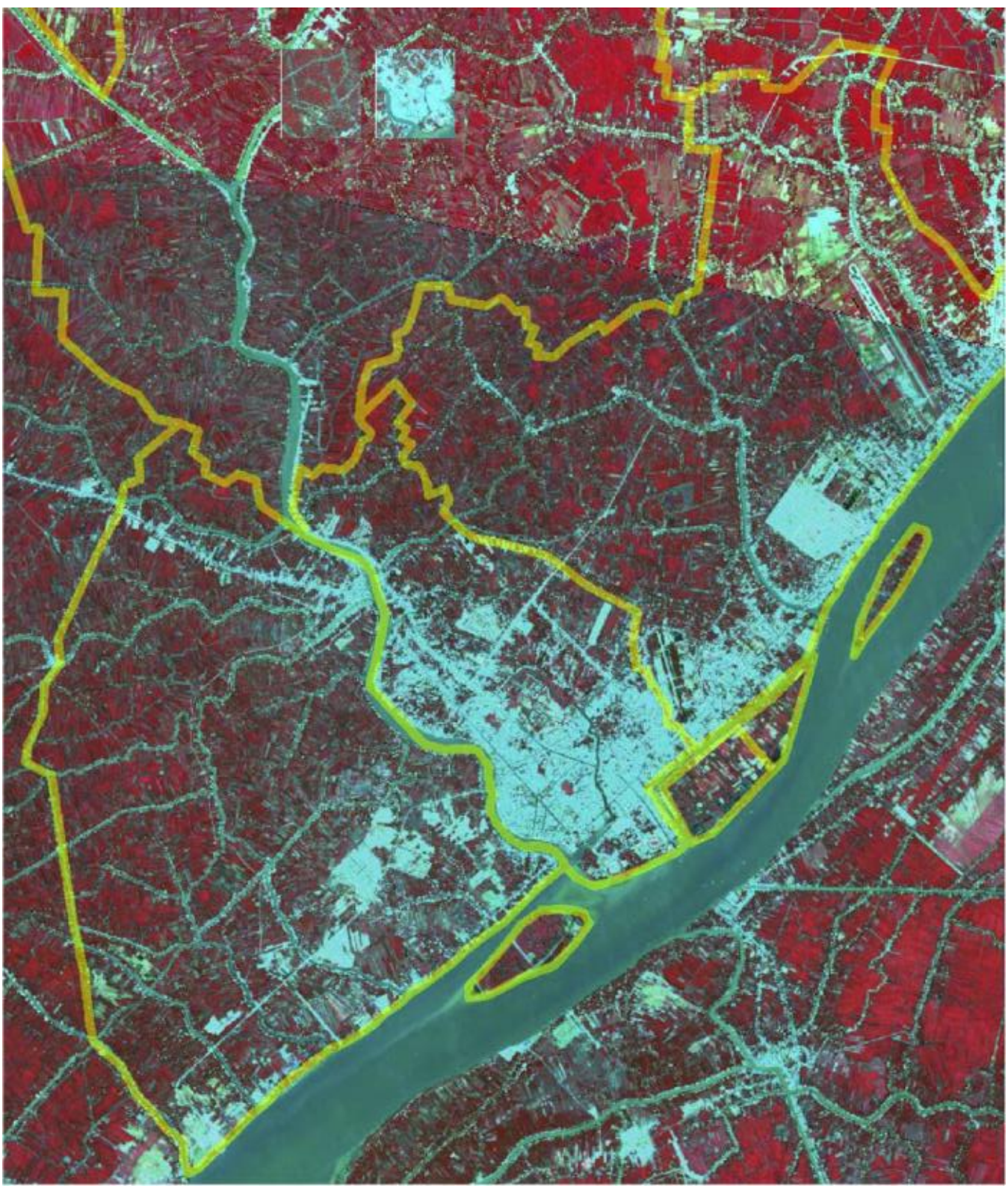
Photo: Chris Zevenbergen

Bangkok in the 21st century: conquering nature
Living with water vs mastering waterscapes

Still Shot from the film "EAST KOLKATA WETLAND: Ecologist's Perspective", directed by Mukulika Dattagupta and Tulika Bhattachaya.

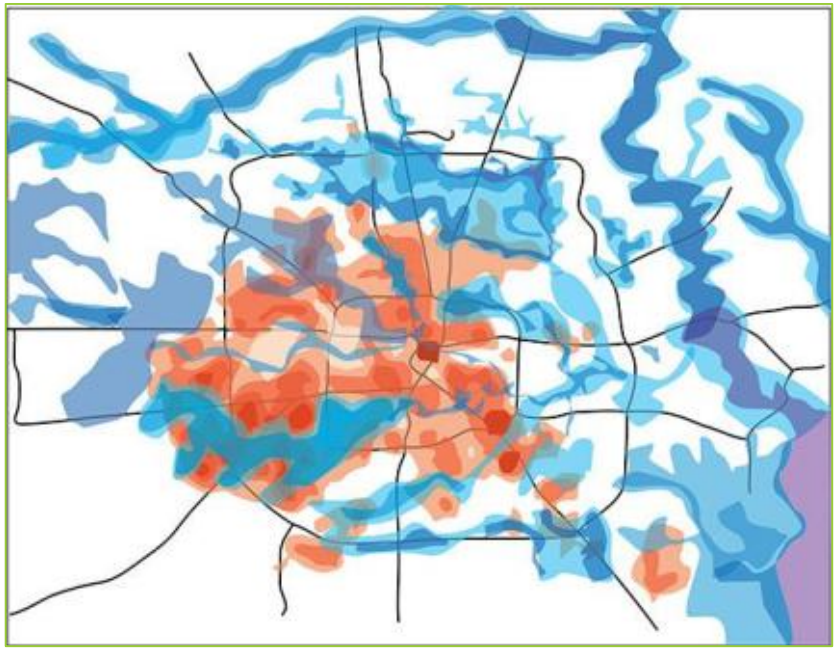
Can Tho, Cai Rang district, Vietnam

Source: Sudmeier-Rieux et al (2015)

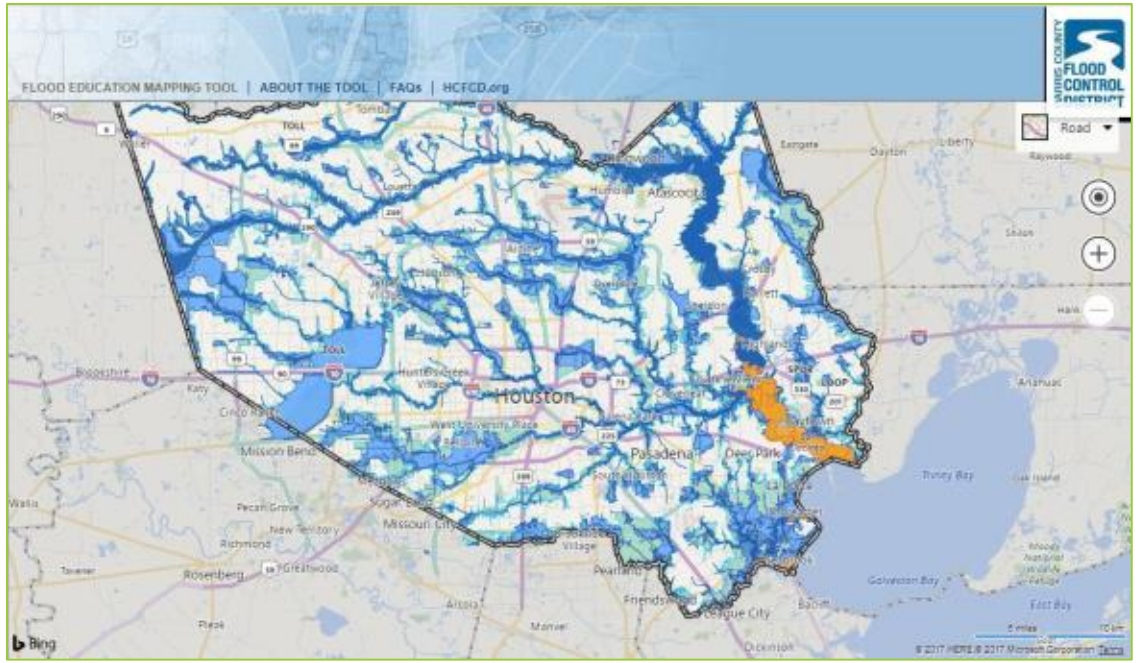


Downtown Houston after Hurricane Harvey

2017



Building on flood plains: taking a calculated risk



Risk assessment is made more unpredictable due to climate change

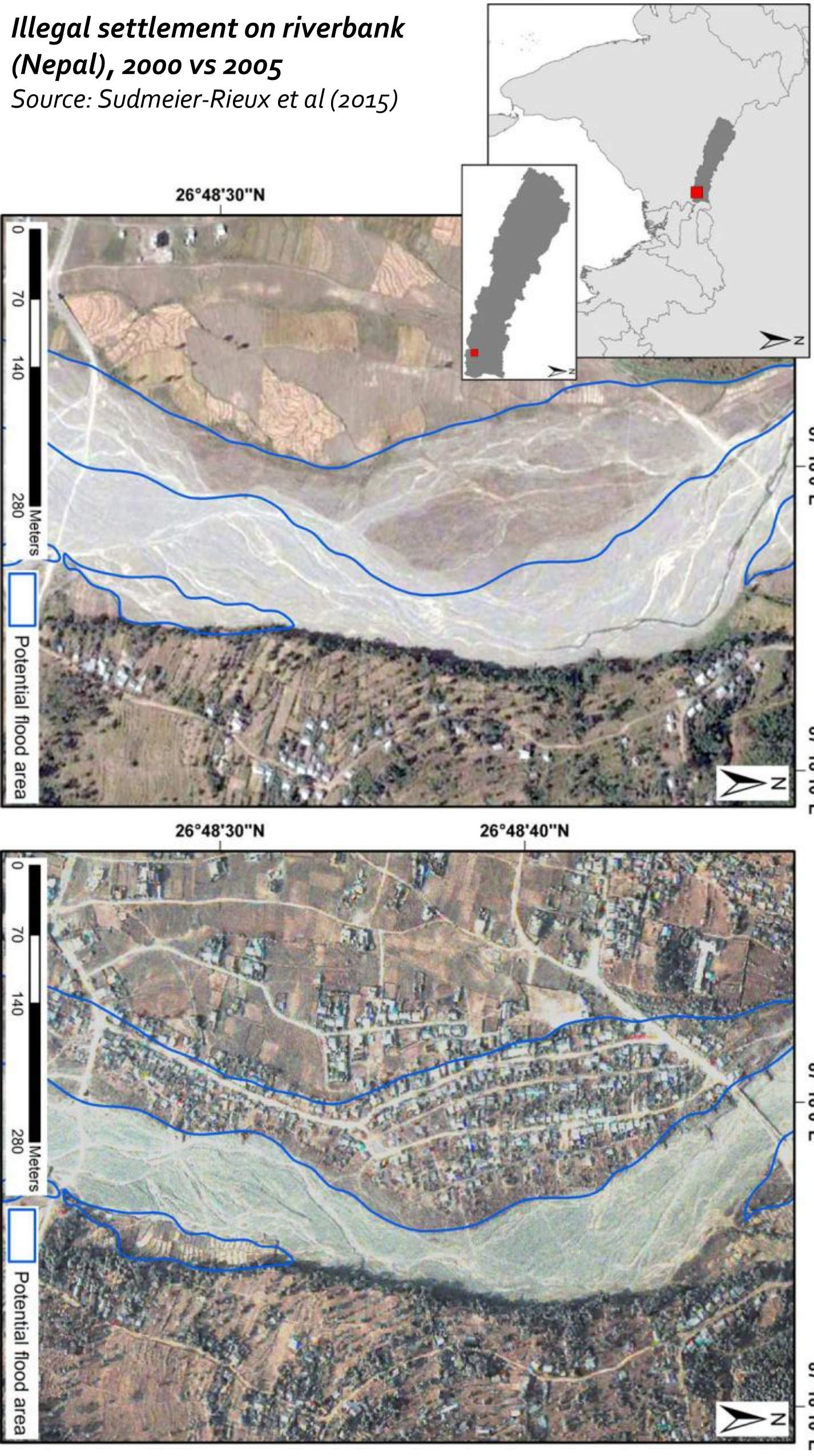
The extra dimension of *informal* settlement

Taking a calculated risk…by choice?

The critical role of tenure systems and the rule of law

Illegal settlement on riverbank (Nepal), 2000 vs 2005

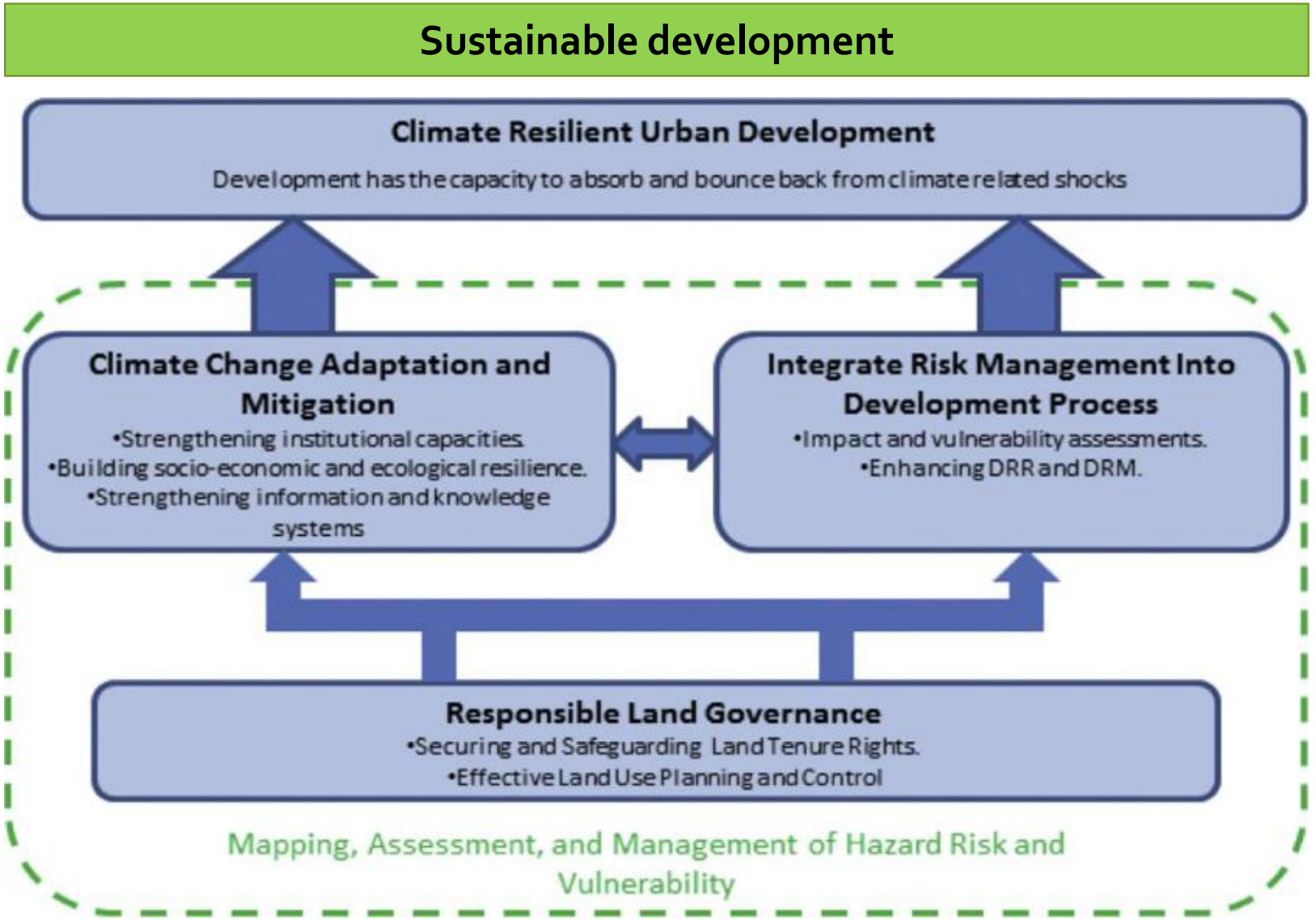
Source: Sudmeier-Rieux et al (2015)



Discussion questions

- What are the principal forces driving land development risk?
- What are the power dynamics involved?
- What can be done?

Overall objective: sustainable development



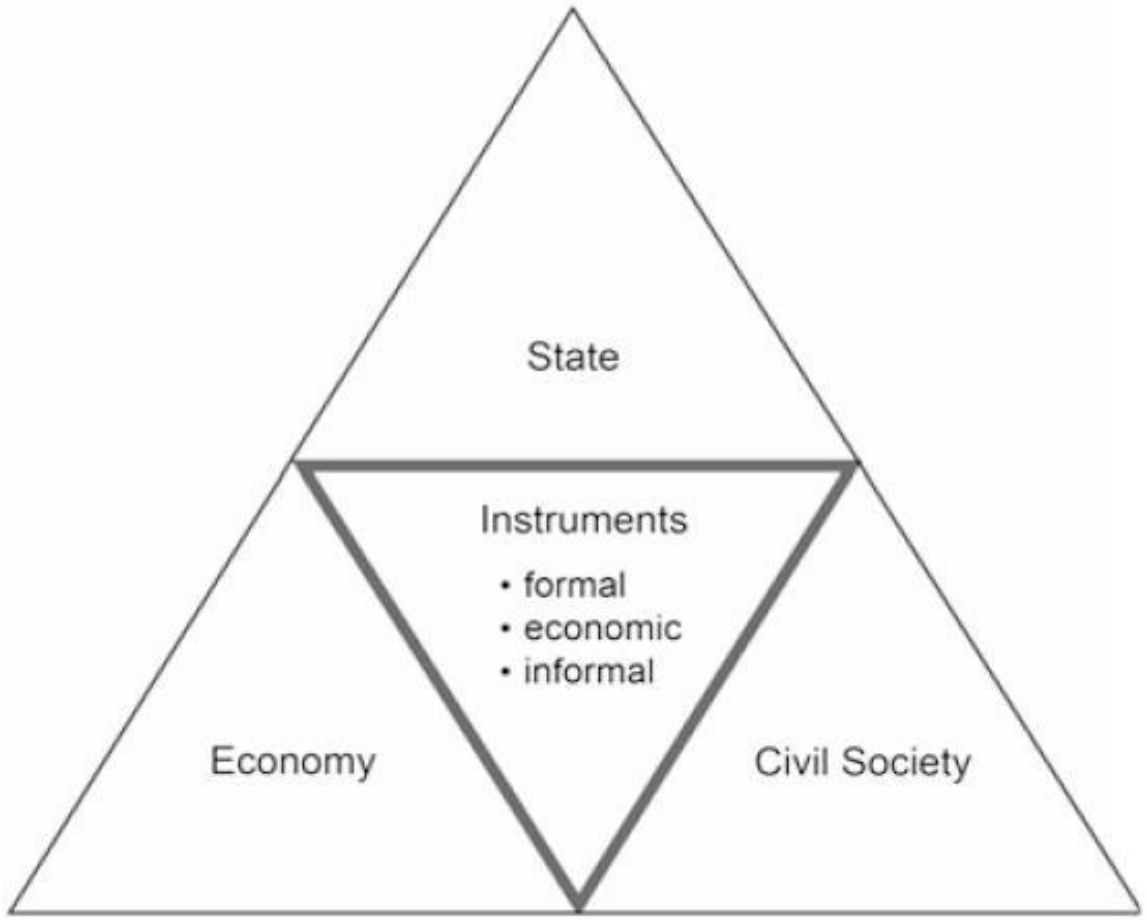
Source: Mitchell et al, 2015

Recommended readings

- Mitchell, D., Enemark, S., & van der Molen, P. (2015). Climate resilient urban development: Why responsible land governance is important. *Land Use Policy*, *48*, 190-198.
- Rijke, J. et al. (2012). Room for the River: delivering integrated river basin management in the Netherlands. *International Journal of River Basin Management*, *10:4*, 369-382
- Tropp, H., 2007. Water governance: trends and needs for new capacity development. *Water Policy*, *9*(S2), 19-30.

Topic 2: Land development—governance dimensions

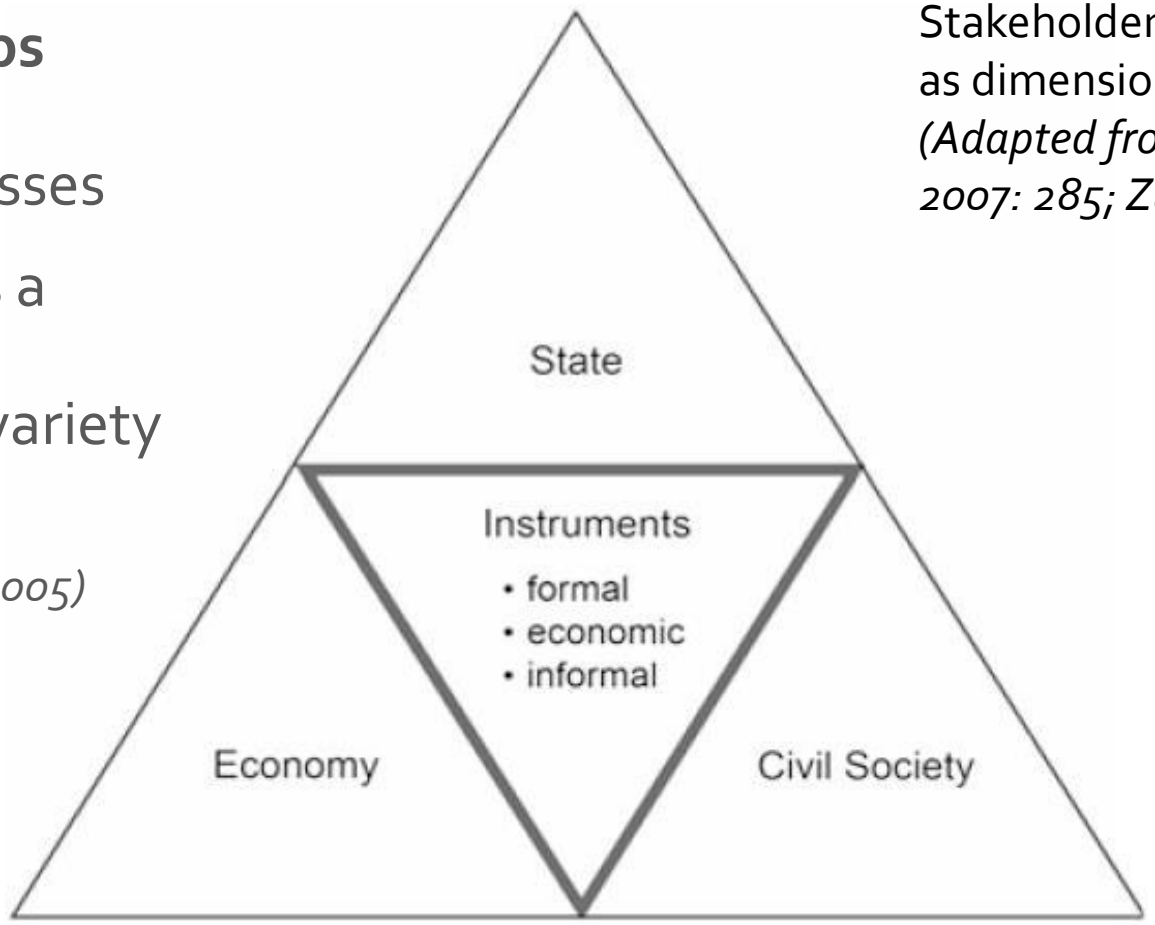
What is "governance"?



"Governance"

- Complex **inter-relationships** between stakeholders and societal coordination processes
- Governance… incorporates a multitude of structural and **regulatory forms** across a variety of different stakeholders

Froelich & Knieling (2013)/Benz (2004; 2005)



Stakeholders and instruments as dimensions of governance *(Adapted from Jordan et al. 2007: 285; Zürn 2008: 556)*

Governance aspects

- Regulations
- Enforcement
- Incentives
- Capacities
- Partnership
- etc

Governance: dimensions relevant to land

Land governance—a working definition:

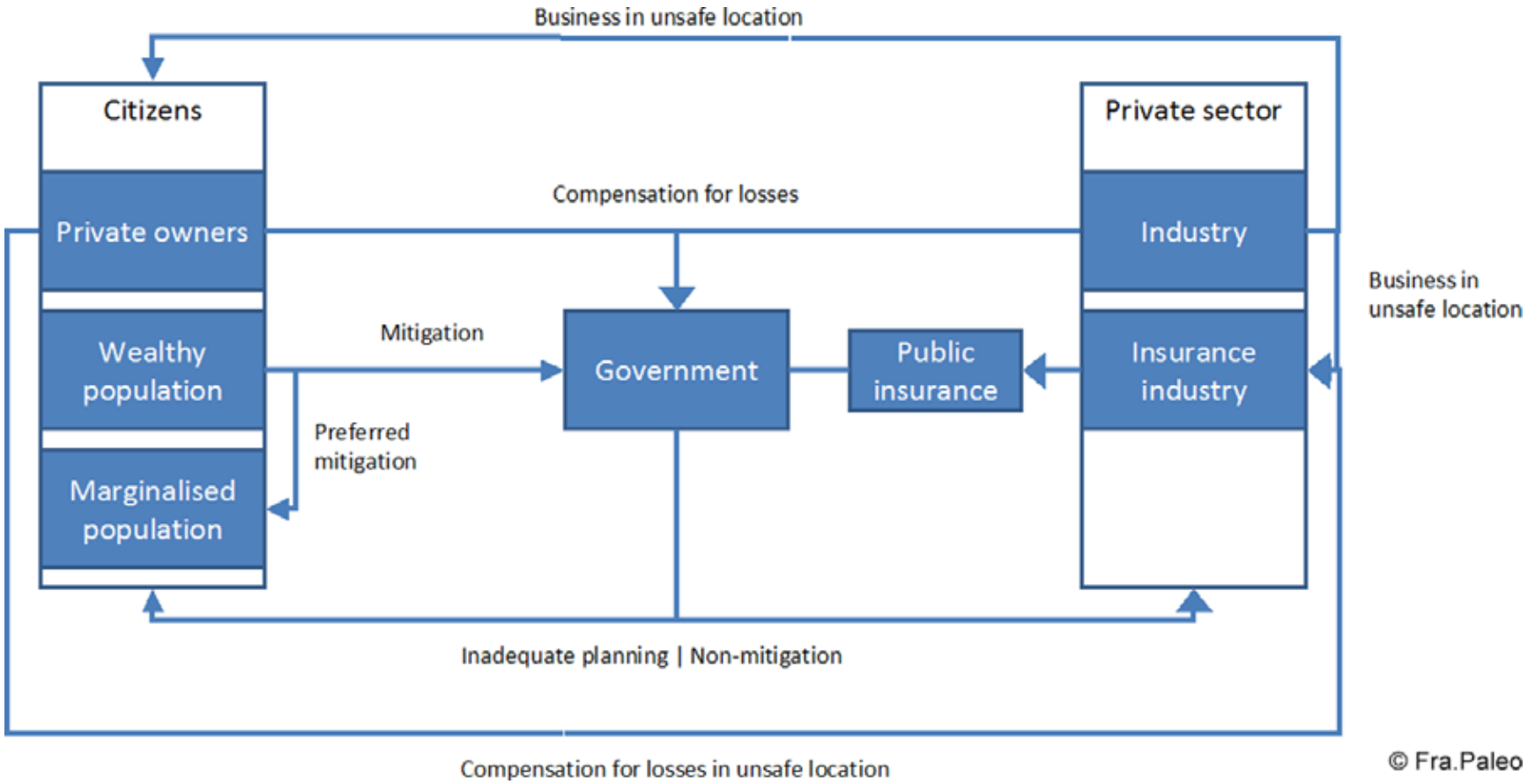
- "*The process by which decisions are made regarding the access to and* ***use of land****,* ***the manner in which those decisions are implemented****, and the* ***way that conflicting interests in land are reconciled****"* (GLTN/FAO/UN-Habitat)

"Governance"

Key elements (GLTN/FAO/UN-Habitat):

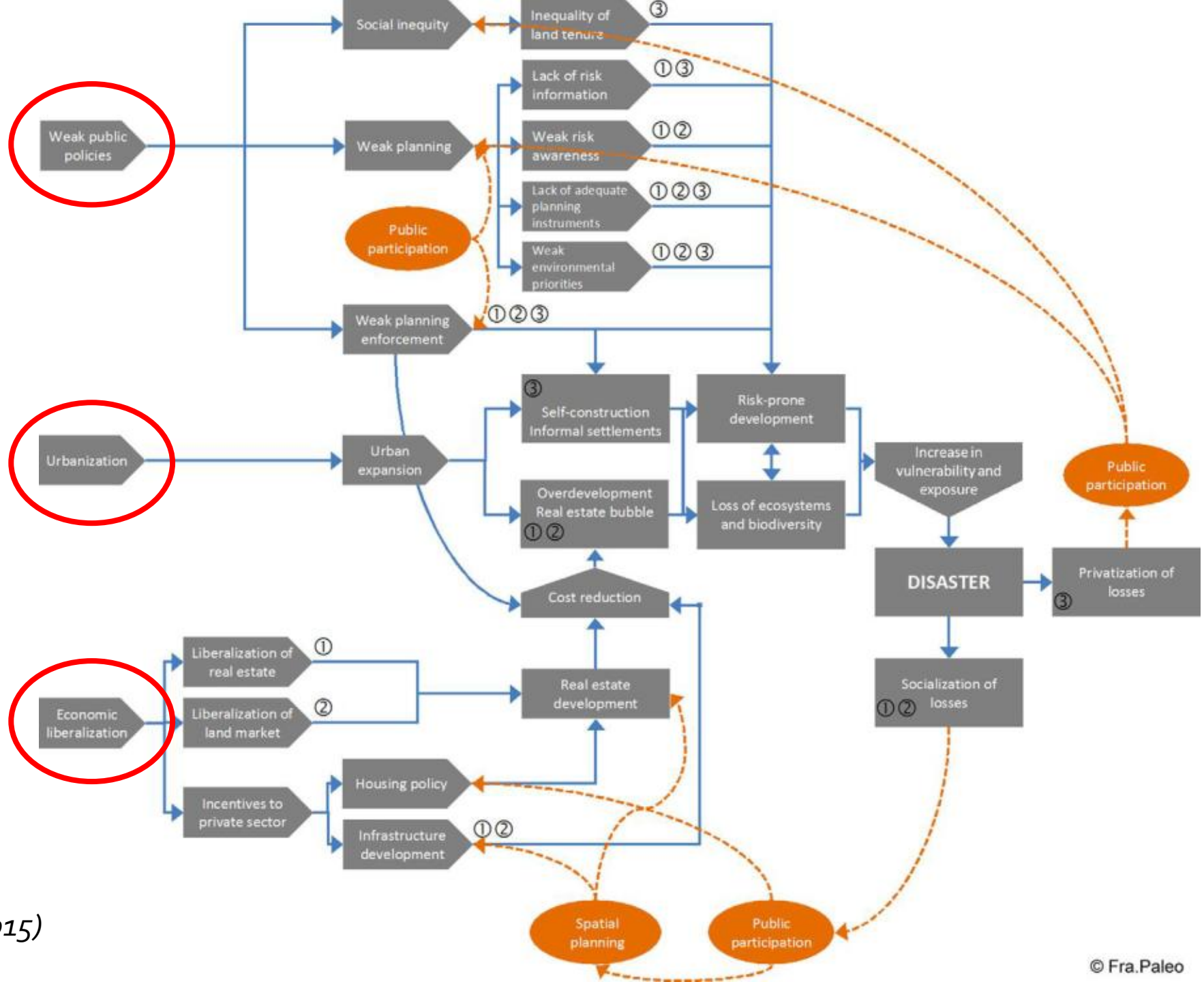
- Analysis of stakeholders, interests, incentives, and constraints
- Decision-making, implementation and conflict resolution
- Emphasis on both process and outcomes
- Need to understand both institutions (rules) and organisations (entities)
- Recognize statutory as well as customary informal/extra-legal institutions and organisation

Diagram of actors and interactions



Source: Sudmeier-Rieux et al (2015)

Key factors leading to risk-prone development and their interplay in different risk scenarios



Source: Sudmeier-Rieux et al (2015)

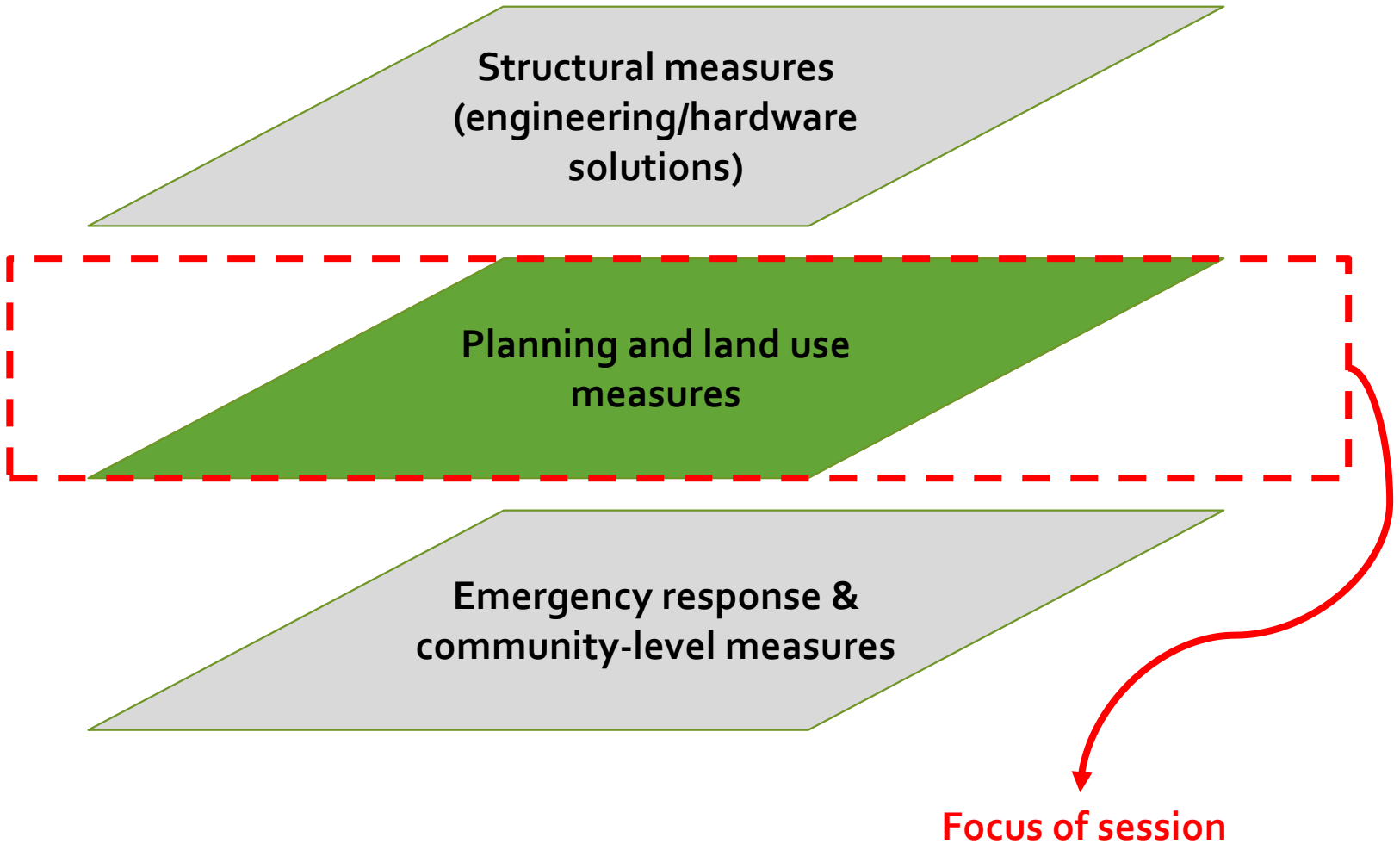
Complex problems

- The water problem is a so-called **"persistent" problem**: "new types of societal problems that are characterized by significant complexity, structural uncertainty, high stakes for a diversity of stakeholders involved, and governance problems" (Dirven et al. 2002).
- **"Wicked problems"** (Rittel and Webber, 1973): "ill-structured problems in which complex societal interactions, highly uncertain physical processes and management dilemmas are present".

Source: van der Brugge, Rotmans and Loorbach, 2005

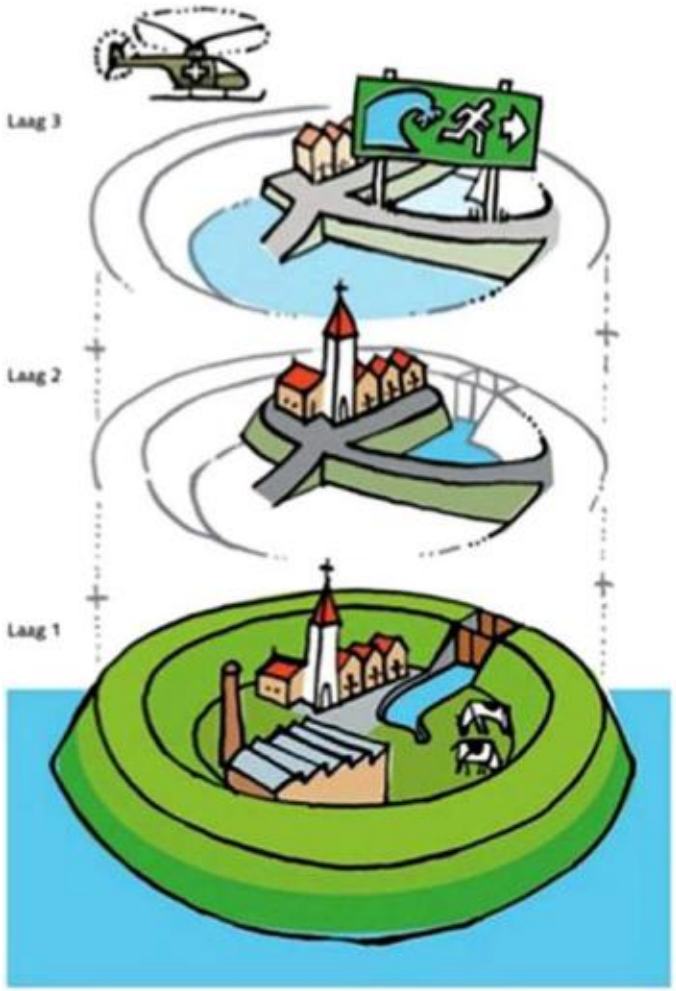
Topic 3:
The Dutch context and "Room for the River"

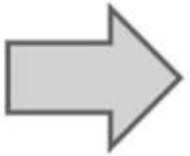
Three levels of risk reduction

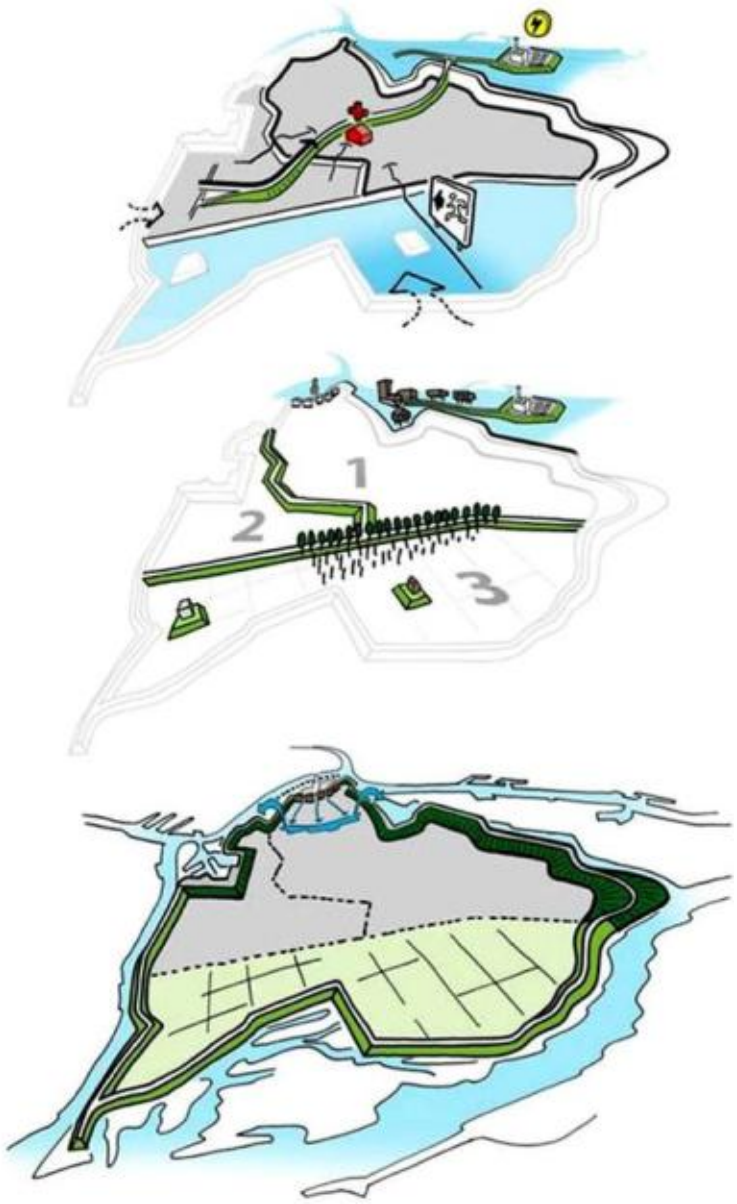


Based on "multi-layer system of protection" in Dordrecht (Netherlands)

Multi-layer safety system in Dordrecht (NL)

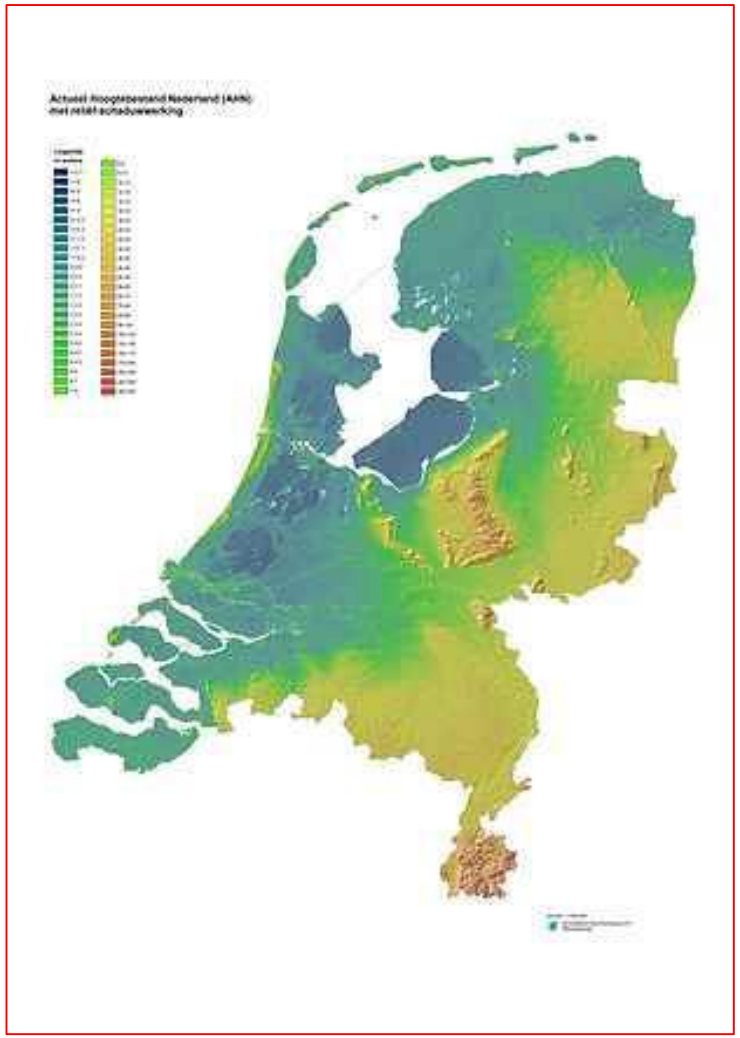






Source: Gersonius, Rijke, et al (2015)

The Netherlands: Land from water



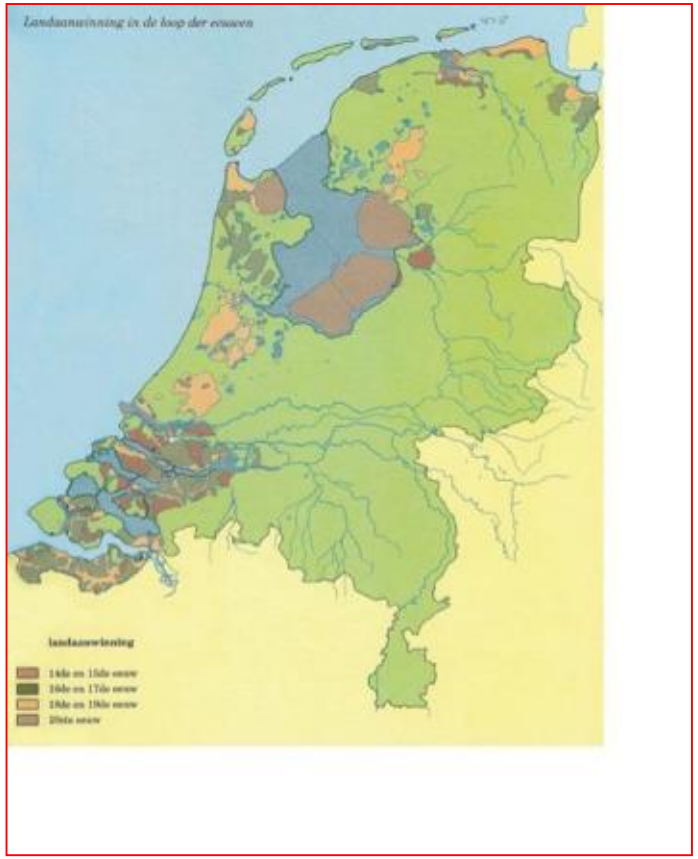
Source: Kennislink.nl

Centuries of filling in and reclaiming land: in the Netherlands, water management is an integral part of land management and planning

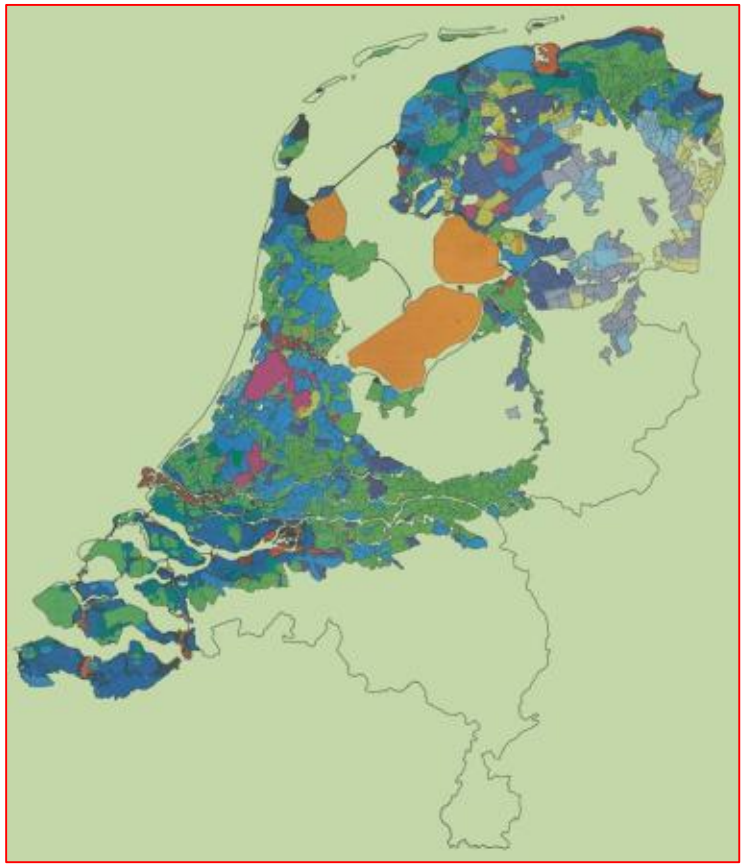
Unidentified map (1785)

The Netherlands: Land from water (2)

Illustration of polders and dike building over the centuries: basis of an engineering (structural) approach to water management



Source: Bosatlas (1948)



Source: Bosatlas (1948)

Historical Context

- Originally, water management was the responsibility of individual land owners and local communities.
- From 1100 onwards:
  - Swamps were drained, resulting in soil subsidence and necessitating supra-local flood protection and drainage works, supervised by regional water boards.
- From 1400 onwards:
  - Polder boards were established to drain small polders by means of wind mills.
  - These polder boards were the forerunners of the water boards.
  - Water boards were the first democratic structures in the Netherlands

Based on Mostert, 2006 (Integrated Water Resource Management in the Netherlands)

Water Governance in the Netherlands

Source: Trouw

- National level (Ministry & Rijkswaterstaat):
  - National policy and regulatory function
- Provinces:
  - Supervise water boards and municipalities
  - Regional planning function
  - Groundwater quality
- Water boards:
  - Manage surface water and sewage in their regions
- Municipalities:
  - Responsible for sewers

Based on Rijksoverheid.nl (2015)

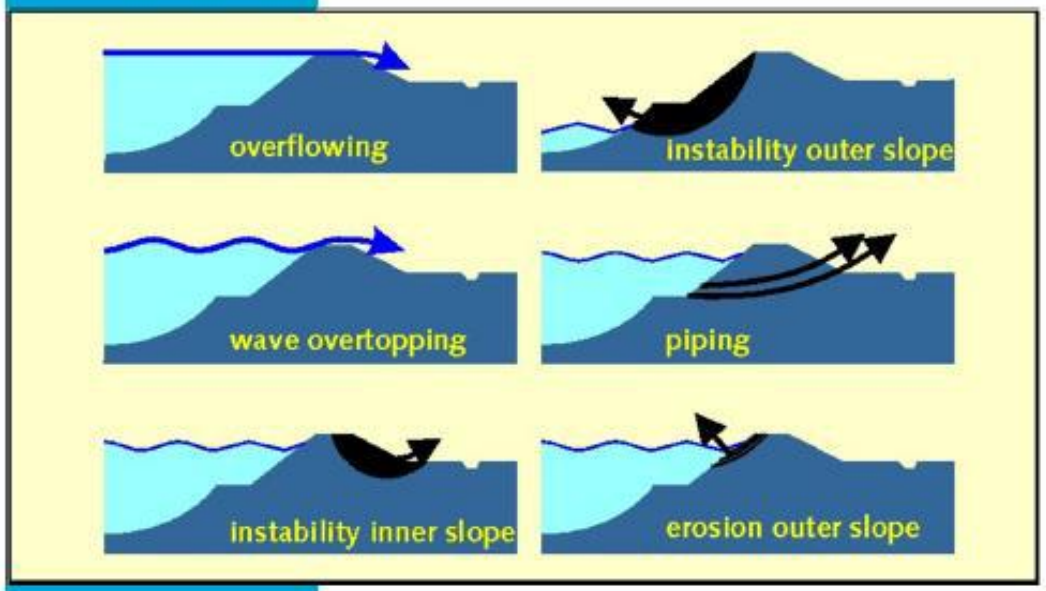
Transition in Water Management (2)

A transition is underway in planning for water in the Netherlands

- From an overly technical/engineering approach to a more nature-based approach
- "The 'pumping-drainage-dike raising' strategy has not resulted in a sustainable water system"
  - Natural disasters (flooding in 1993, 1995, early 2000s)
  - Unprepared for climate change effects

From: *van der Brugge, Rotmans & Loorbach, 2005: "Transition in Dutch Water Management"*

Failure mechanisms of levees



Source: Chris Zevenbergen, Unesco-IHE

"Room for the River"
(The Netherlands)

Source: Ruimte voor de Rivier

A risk-reduction program created in response to flooding emergencies in the Netherlands in the early 1990s ➔ learning from the mistakes of a traditional water defense system that was too dominated by structural (engineering) measures

Flooding in early 1990s: river water emergency due to heavy rainfall

Source: ANP & NOS (top left)

Evacuation of 250,000 people (1995)

"Room for the River"

> Program summary

The "Room for the River" (RvR) program makes more space available for rivers and surrounding land to manage high water levels

Multiple benefits:

- Safety: creating more room for water to flow or evacuate
- Planning: creating more attractive urban and rural landscapes in the process

"Room for the River"

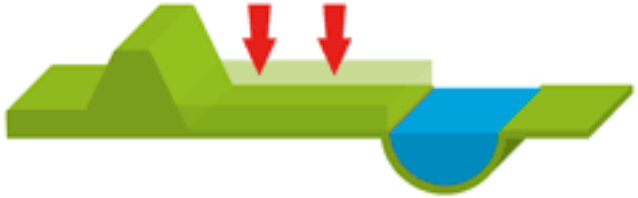
> Projects in the Nether-lands

Source: https://www.ruimtevoorderivier.nl/projecten/

"Room for the River"

> Range of measures to create more space for river water

Lowering the floodplain



De-poldering

Dyke relocation

New high water channels

Removing obstacles to water flow

Strengthening dykes

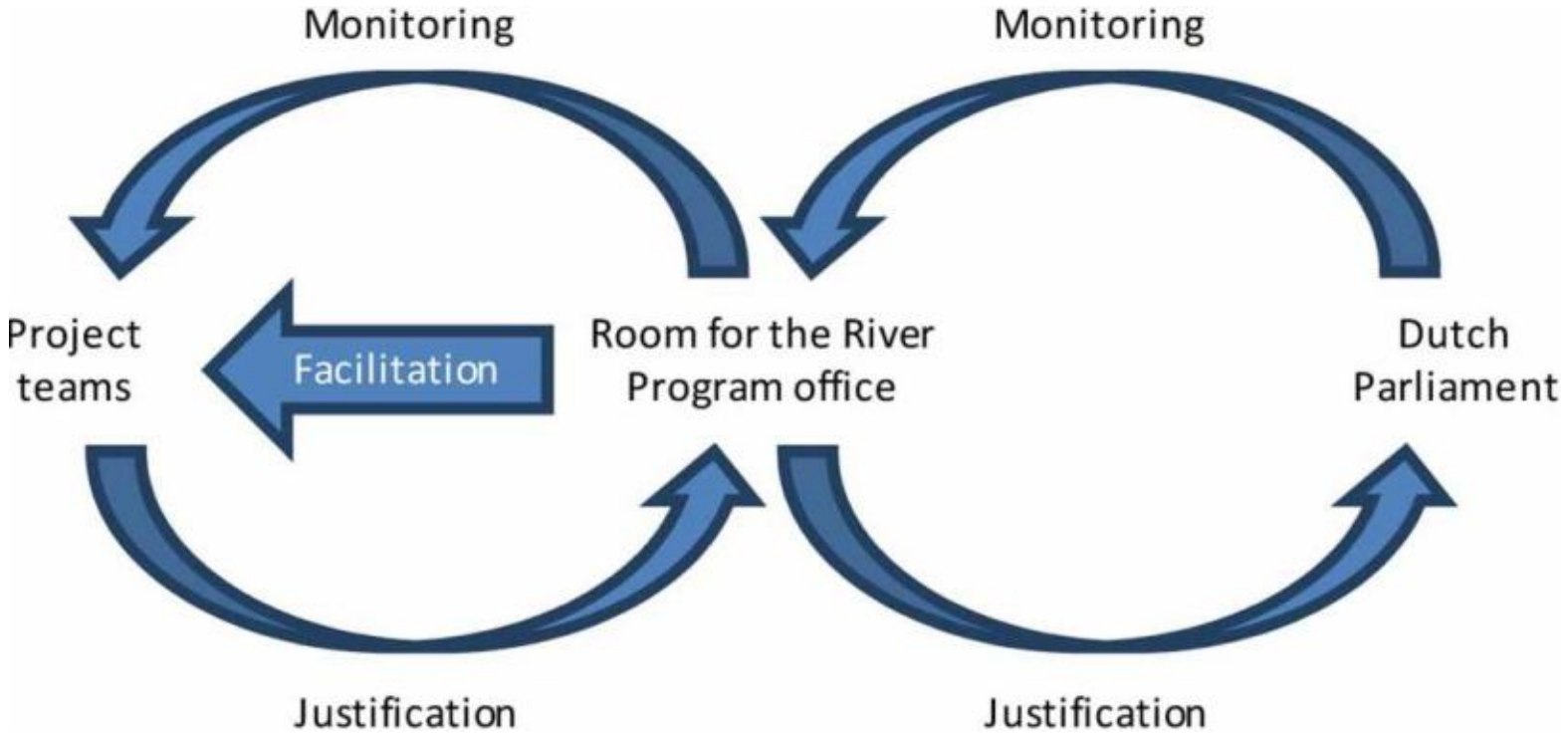
Deepening the riverbed

Temporary water storage areas

RvR: Financial and institutional components

- Total program budget: 2.2 billion euro (2007 to 2017)
- Central government-funded (Ministry of Infrastructure and the Environment)
- Key partners: central government (Ministry; Rijkswaterstaat); provinces; water boards and municipalities
- Heavy investment in community outreach (information and participation)

Governance principles of Room for Rivers program



- "Collective" leadership
- Implementation agreements involving principal stakeholders
- National government as client
- Local project teams design and implement the projects

Source: Rijke et al, 2012

The Case of Nijmegen

> Summary

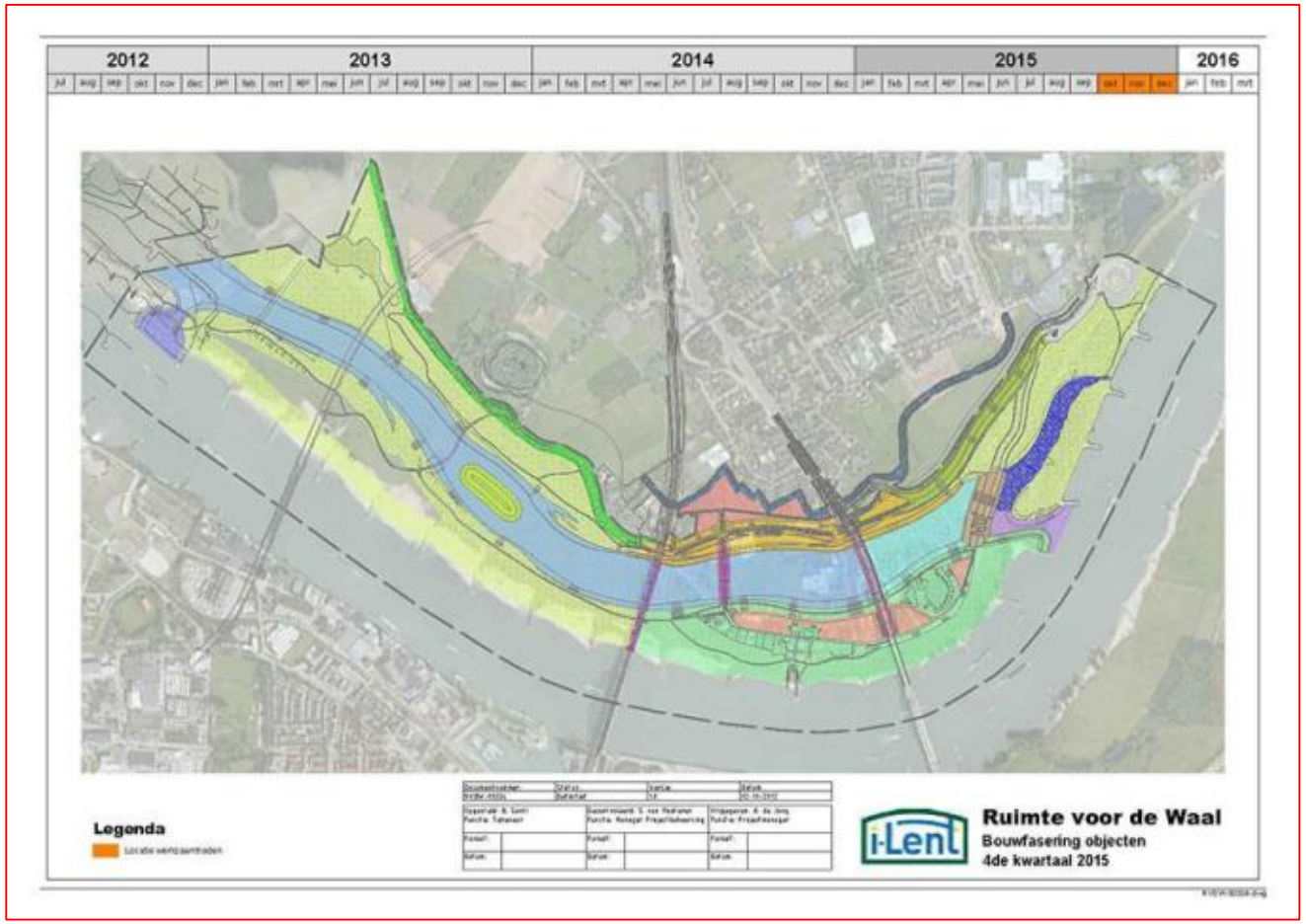
Source: Ruimte voor de Waal (Nijmegen) project website

- In Nijmegen, the river Waal not only has a sharp bend near the city, it also forms a bottleneck, which leads to high water and floods.
- To prevent flooding, the government moved the Waal dike in the town of Lent and constructed an ancillary channel in the flood plains.
- This created an island in the Waal and a unique urban river park with lots of possibilities for recreation, culture, water and nature.
- The solution is billed as “far-reaching, yet sustainable and safe”.

The Case of Nijmegen

> 5 sets of measures

http://www.ruimtevoordewaal.nl/en/room-for-the-river-waal/



Source: Ruimte voor de Waal (Nijmegen) project website

Topic 4: Discussion of key themes

Key themes and questions

Two main overlapping themes:

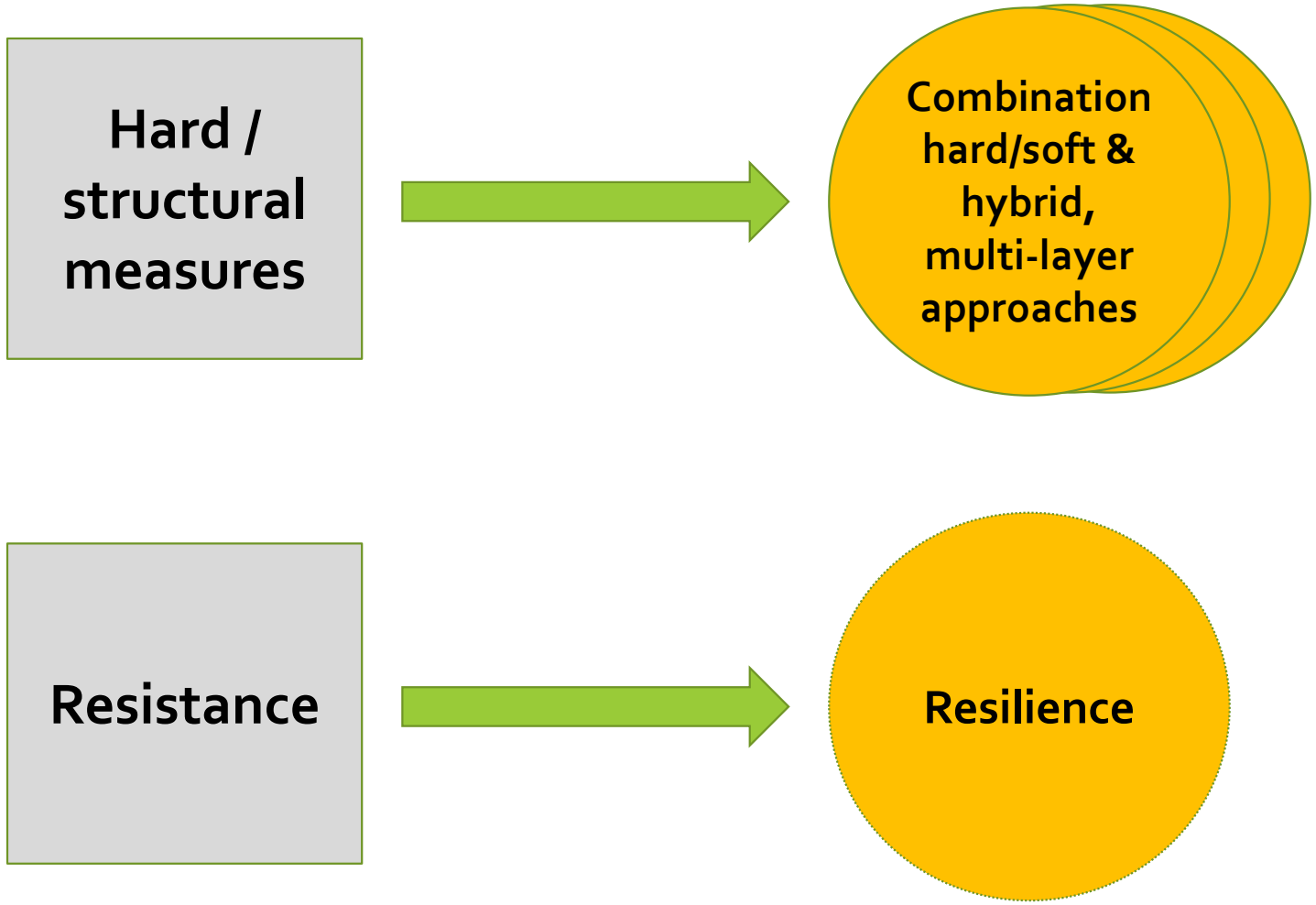
"Learning": an evolution of approaches

- Are we witnessing a real shift towards more integrated land and water management?
- Are we witnessing a transition towards more nature-based solutions and away from purely structural measures (ecology approach)?

Governance

- Are we witnessing a transition towards multi-actor, decentralized governance – and away from purely top-down models?

Transition in water management



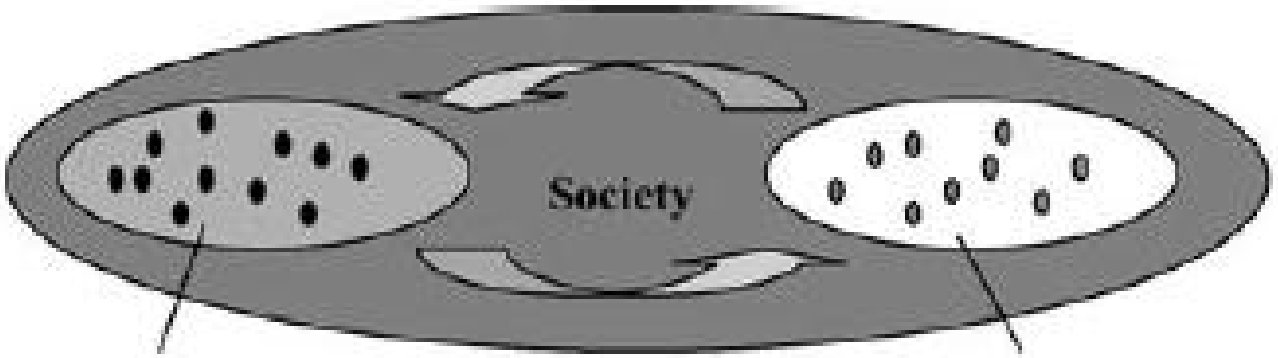
Transition in Water Management

Elements of a new water management approach:

- More integrated and participatory water management
- Integration of social, ecological and physical components of the water system
- "Water is a guiding principle in spatial planning"
  - "Ecological functions and values of water have been prioritized over agricultural functions and economic value of water"
  - Example: "Room for the Rivers" program

From: *van der Brugge, Rotmans & Loorbach, 2003: "Transition in Dutch Water Management"*

A transition in water management



Current policy arena
- *Short-term*
- *Peloton*
- *Incremental improvements*
- *Problem-and goal oriented*

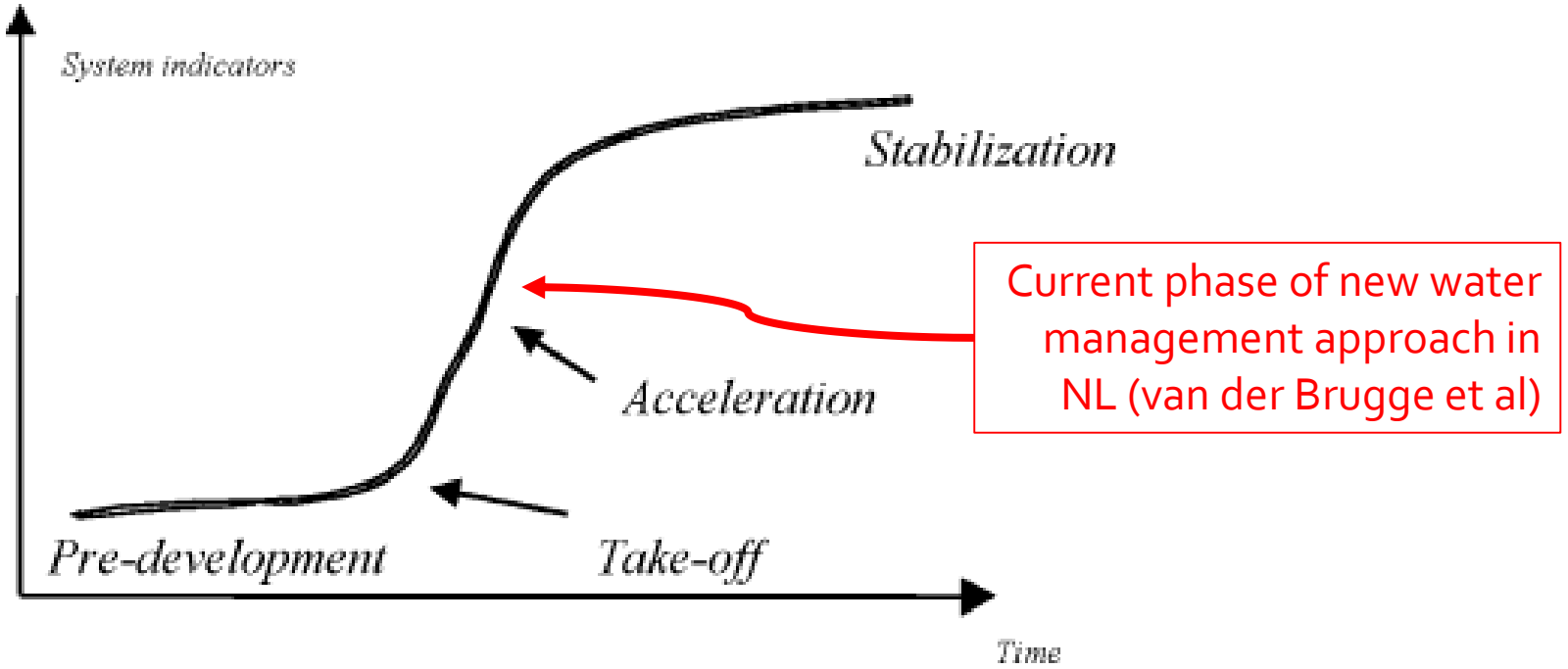
Transition arena
- *Long-term*
- *Frontrunners*
- *System innovation*
- *Problem- and goal seeking*

- "A transition is a structural change in the way a societal system operates".
- RvR appears to represent a systemic transition in water management on many fronts

Source: van der Brugge, Rotmans and Loorbach, 2005

Concept of transition

A transition can be described as a "co-evolution of markets, networks, institutions, technologies, policies, individual behavior and autonomous trends from one relatively stable system state to another".



Source: van der Brugge, Rotmans and Loorbach, 2005

A transition in water management

Old water management style (twentieth century)	New water management style (twenty-first century)
Command and control	Prevention and anticipation
Focus on solutions	Focus on design
Monistic	Pluralistic
Planning-approach	Process-approach
Technocratic	Societal
Reactive	Anticipative and adaptive
Sectoral water policy	Integral spatial policy
Pumping, dikes, drainage	Retention, natural storage
Rapid outflow of water	Retaining location-specific water
Hierarchical and closed	Participatory and interactive

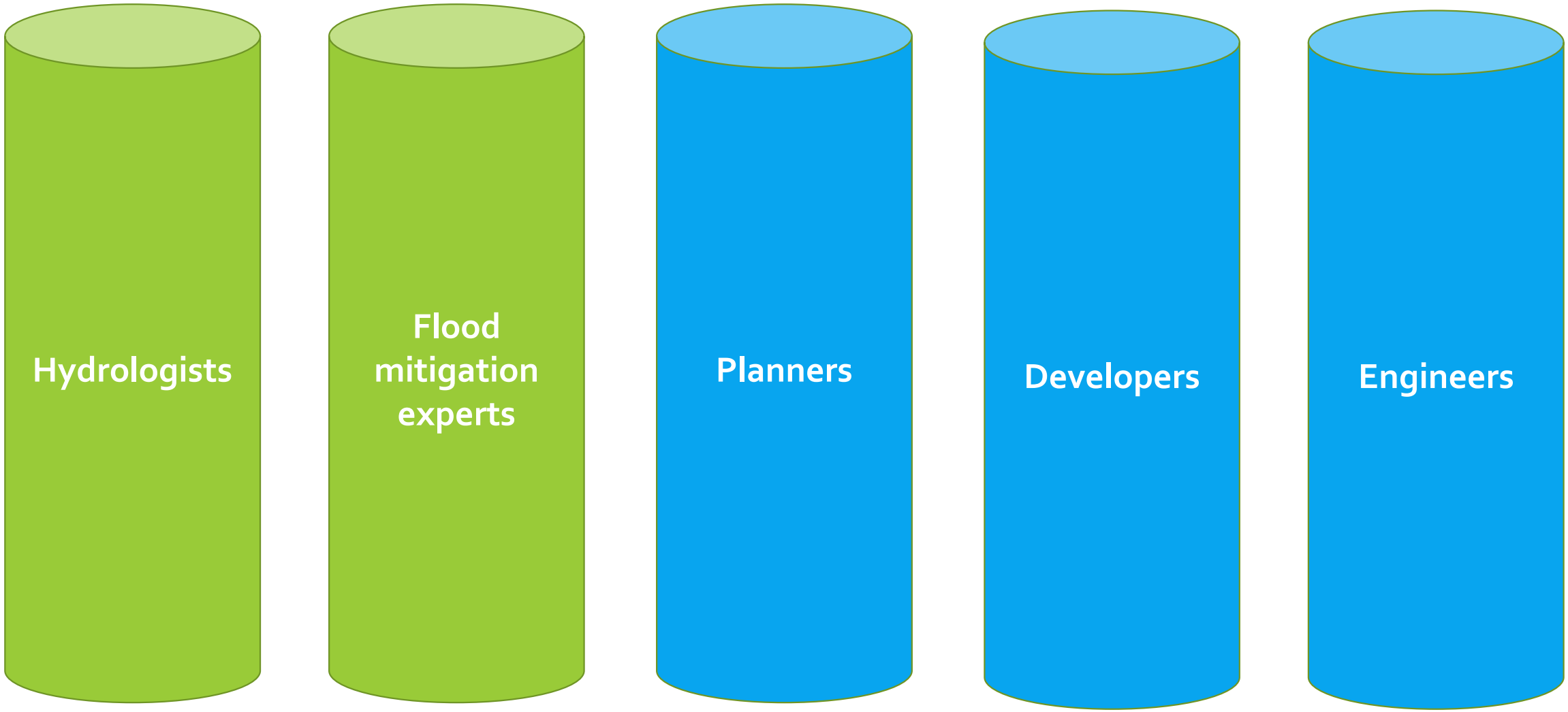
Source: van der Brugge, Rotmans and Loorbach, 2005

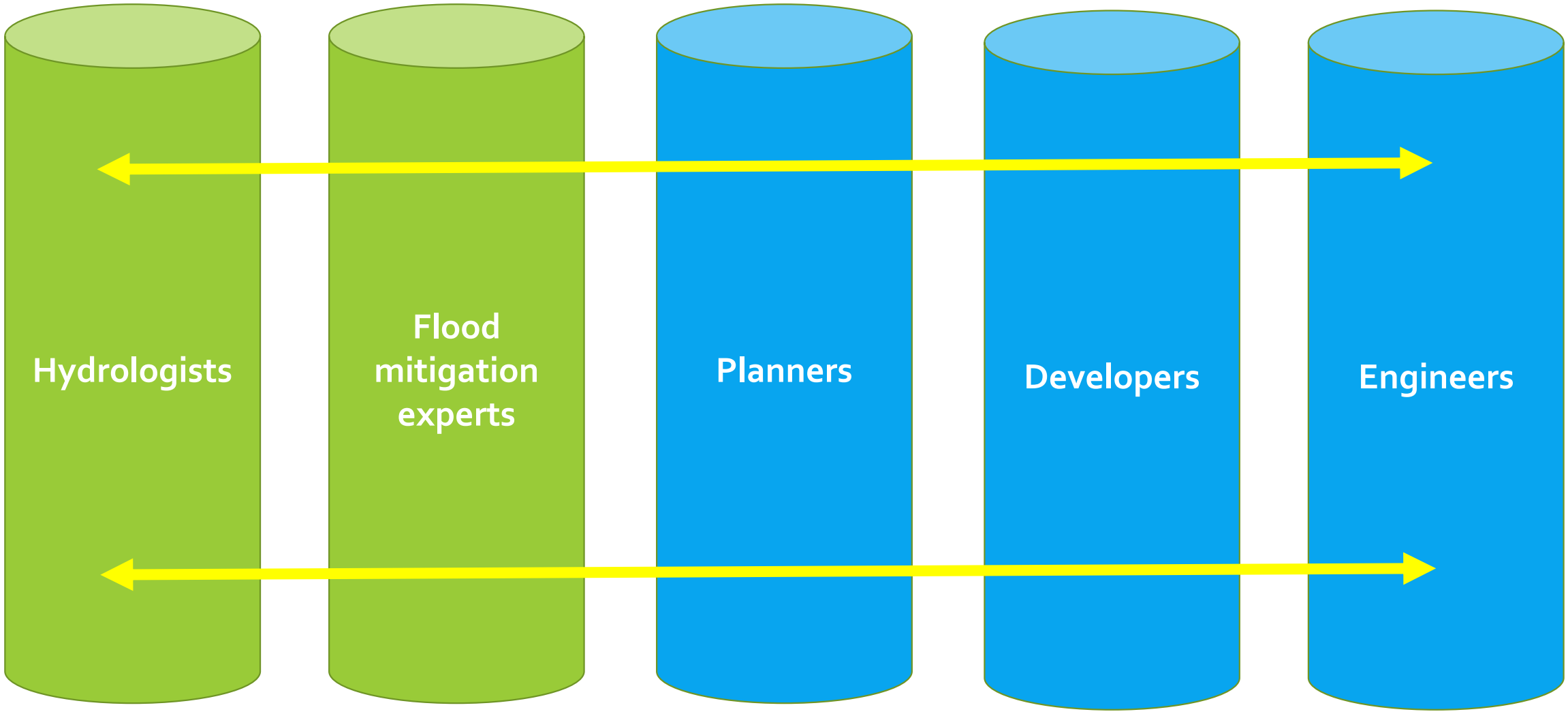
Water governance transformation *(Tropp, 2007)*

New and old forms of (water) governance

Old governance emphasises	New governance emphasises
Emphasises the government and bureaucracy	Civil society and markets. The government and bureaucracy are still important entities but with reduced authority
Political power monopoly	Co-steering
Steering	Diversity of actors and power diffusion
Hierarchical control	Horizontally shared control
Enforcement of rules and regulations	Inter-organisational relations and coordination Decentralisation/bottom-up management
Control	Formal and informal institutions
Top-down management	Co-governing (distributed governance)
Formal institutions	Network governance
Inter-governmental relations	Process orientation
	Expansion of voluntary exchange, self-governance and market mechanisms
	Dialogue and partnership
	Participation and negotiation

Tropp, 2007


Hydrologists
Flood mitigation experts
Planners
Developers
Engineers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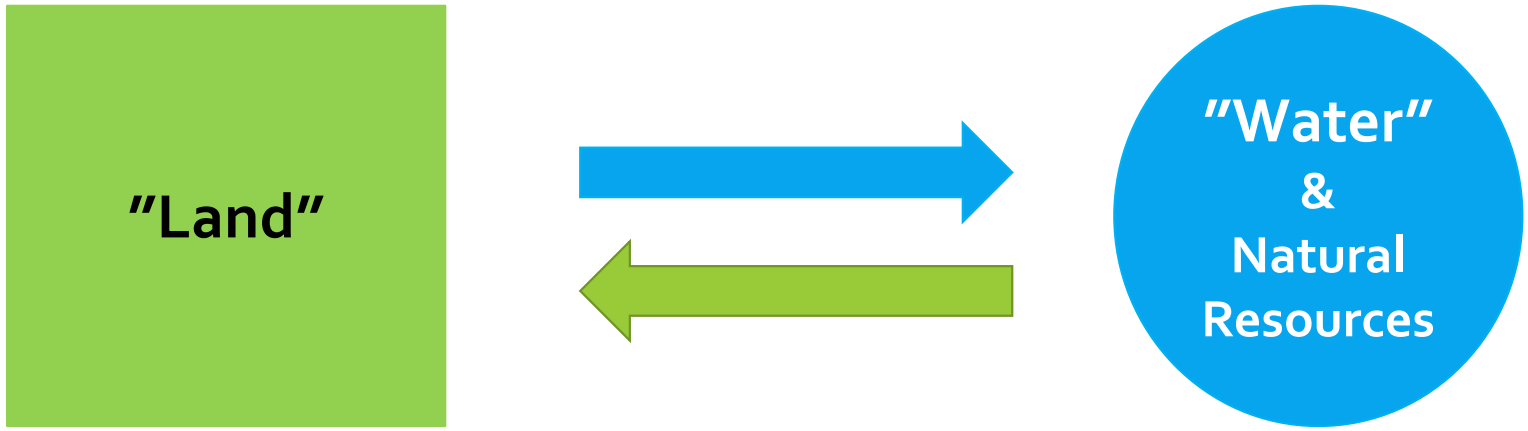
Water and cities: a "love-hate relationship" (Feldman, 2017)



Land and land based activities and water are an integrated whole (an "ecology")
We can no longer look at land and water in isolation
What happens on one side has implications for the other


Towards a new
Urban ecology?