

# Governance of Large Infrastructures

Jill Slinger and Leon Hermans  
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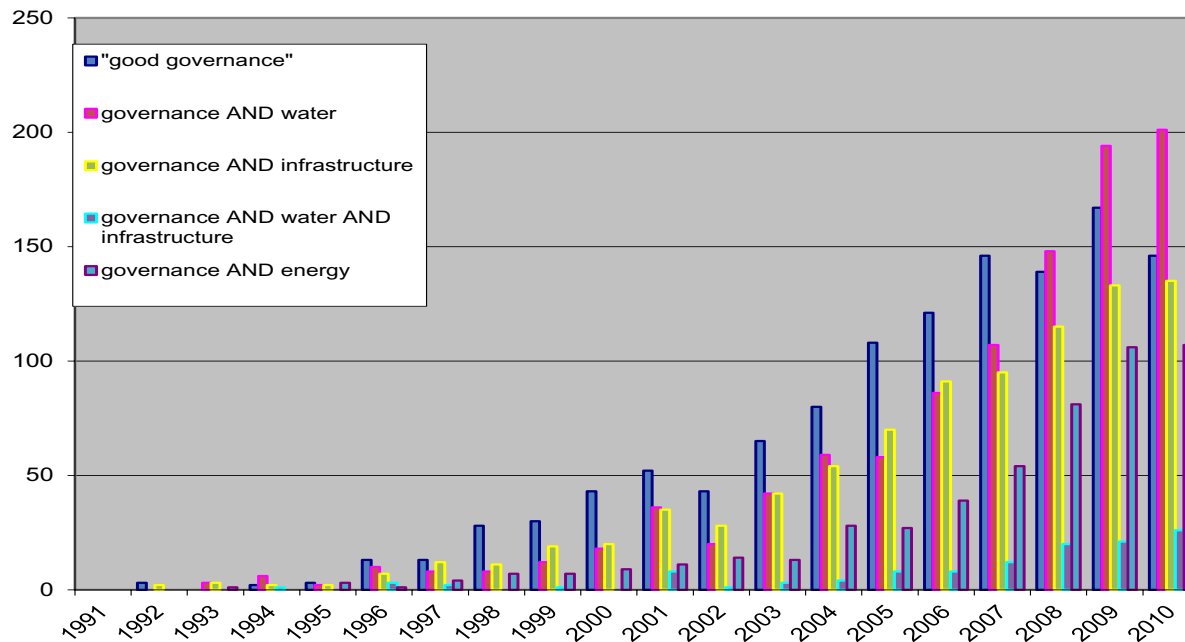
based on discussions with  
Joyeeta Gupta, Rhodante Ahler, Pieter van der Zaag and Erik Mostert,  
amongst others

# Why governance?

- Growing attention for governance
- e.g. "Recognising that the water crisis is largely a crisis of governance" World Water Development Report 2006, p1

□

Publications in Scopus on Governance, 1991 - 2010



# Why governance?

- No one stable or consistent set of institutional principles to manage our water resources
- If the increasing emphasis on governance is to yield more than cosmetic change we need to have clarity on its meaning, the contributions that we can expect and the limitations

Ability of people to share, access, compete for power and to enjoy the collective benefits and services of the state. Broader than exercising political, economic and administrative authority

# Why large infrastructures?

- Large infrastructures have large environmental impacts
- Large infrastructures have large economic effects
- Large (technical) infrastructures configure societies just as they are configured by societies
- Changing environmental context e.g. climate change, increasing acknowledgement of uncertainty
- Large infrastructures are once again on the upsurge, particularly large dams



# Why large infrastructures?

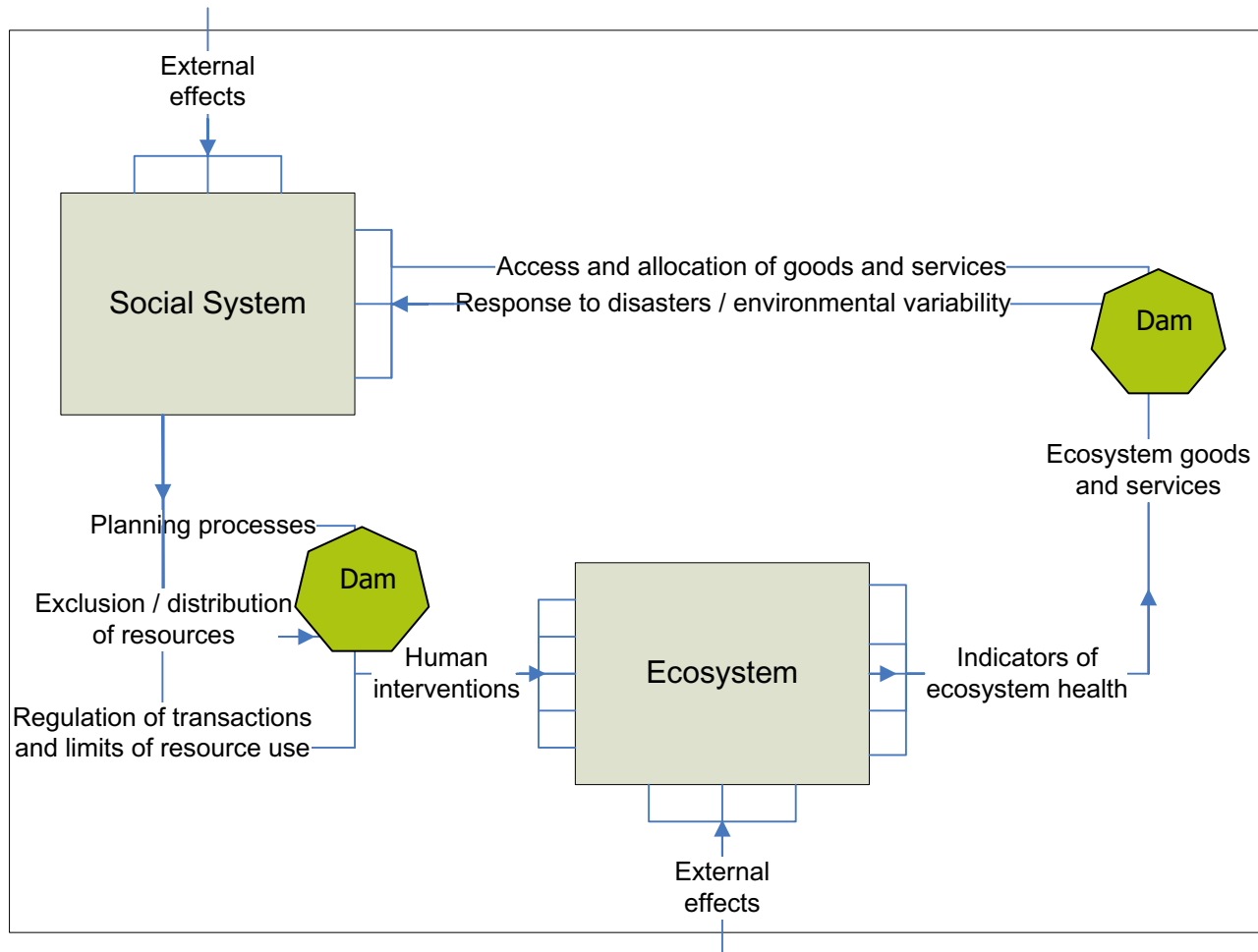
- Large infrastructures are out of sync with policy processes
  - Long lifetimes
  - Spatial extent of their influence commonly exceeds administrative authority's jurisdiction
  - Accidents or extreme events throw new light on institutional design



# Dams as governance object

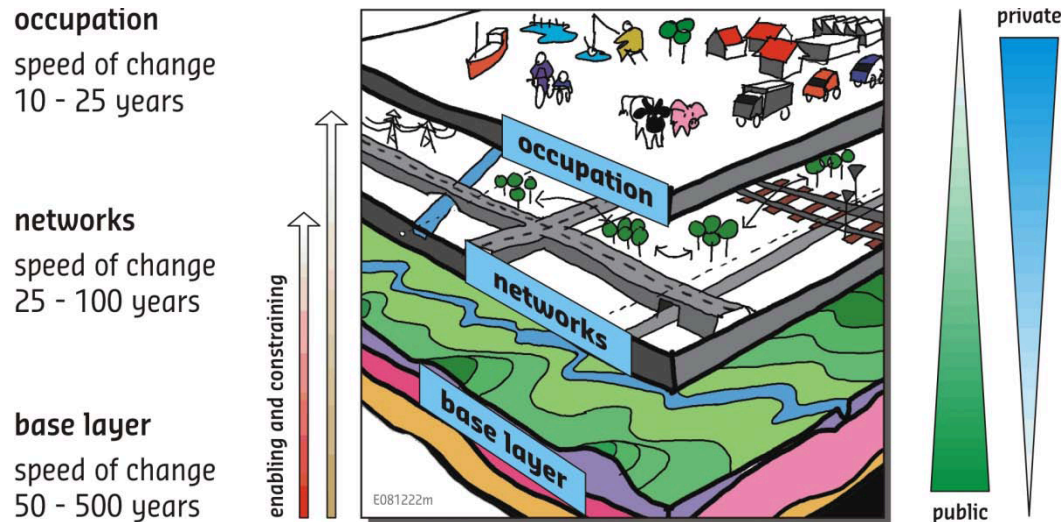
- Dams are water governance instruments in the sense that they can be used to determine “the access to and control over water resources and their benefits” (SWI 2006)
- Dams require multi-scale governance and large scale government effort (e.g. standardization, operational routines) focused on the physical character of the infrastructure
- Much disciplinary research, little collaborative research by social and natural scientist on the interconnectedness between the social and physical infrastructural and environmental systems

# Infrastructure in a Social-ecological system



# The three layer model

## Network or infrastructural intervening layer



Layer model of spatial planning (VROM 2001)

# 1. Key distinguishing features

## Environmental resource to be governed

Take resource limits and ecosystem services into account

No direct link to the environmental resource

## 2. Key distinguishing features

### Unit to be governed

Physical infrastructure:

- High upfront costs, maintenance costs
- Sunk costs, irreversibility
- Discrete decisions to construct
- Path dependency
- Separation of costs and benefits
- High prestige, high security projects
- Become symbolic, social identity

Not specified up-front, may be social, physical or both

### 3. Key distinguishing features

#### Institutions

Shapes and is shaped by governance processes and by the infrastructure itself. Governance initially shapes norms, rules and procedures relating to infrastructure, later infrastructure reshapes these. Procedures change over time, diffuse responsibilities

Shapes and is shaped by governance processes

## 4. Key distinguishing features

### Scale

Large:

- Spatial
- Temporal
- Administrative (multi-level governance)

Often mismatch in administrative and influence scales

Any

# 5. Key distinguishing features

## Knowledge

Prioritizes technical / engineering knowledge  
Uncertainty and extremes  
Whose knowledge counts?  
Methods

Contained in mental models of actors

## 6. Key distinguishing features

### Actors

Many actors at:

- Multiple levels of governance
- Varying in importance over time
- Diversity in power
- Special role for actors who understand the infrastructure and its operation

Many

# The way forward

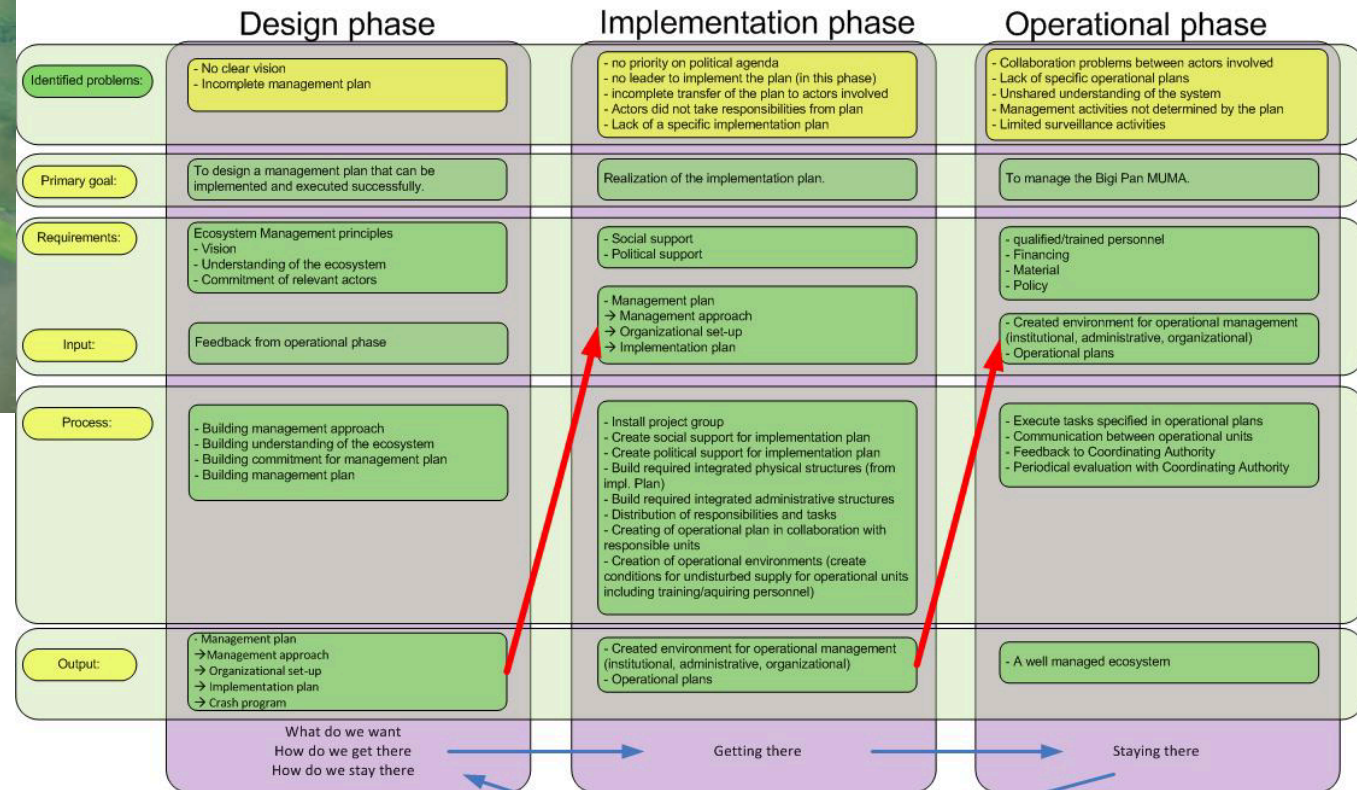
- Elaboration of special features in the **governance** of large water infrastructures
- Similar elaboration is required from the point of view of the **physical infrastructure and environment**
- **Some illustrative examples....**



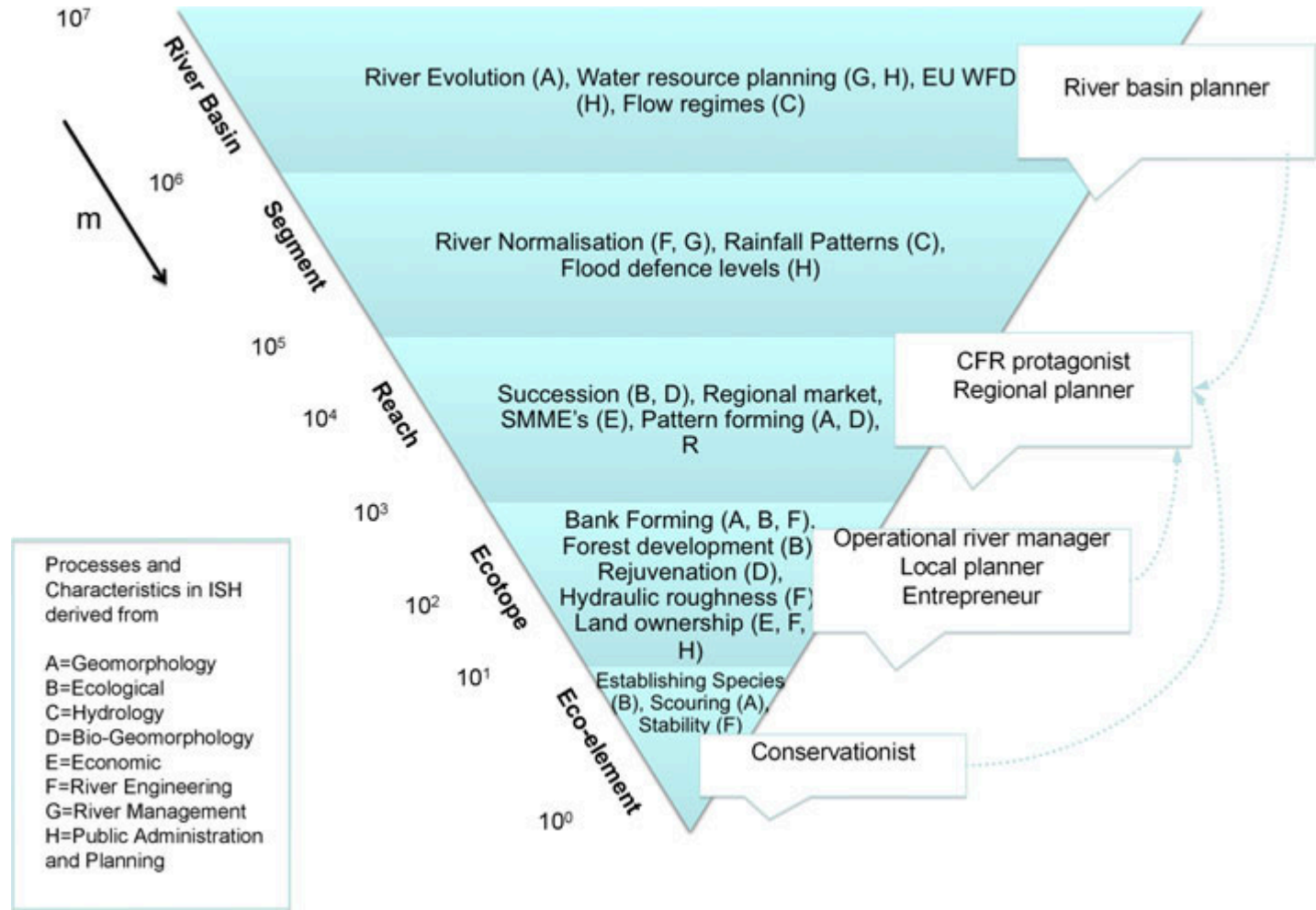
Wolwedans Dam. 3 Aug 2006 DWAF Hydro - Western Cape

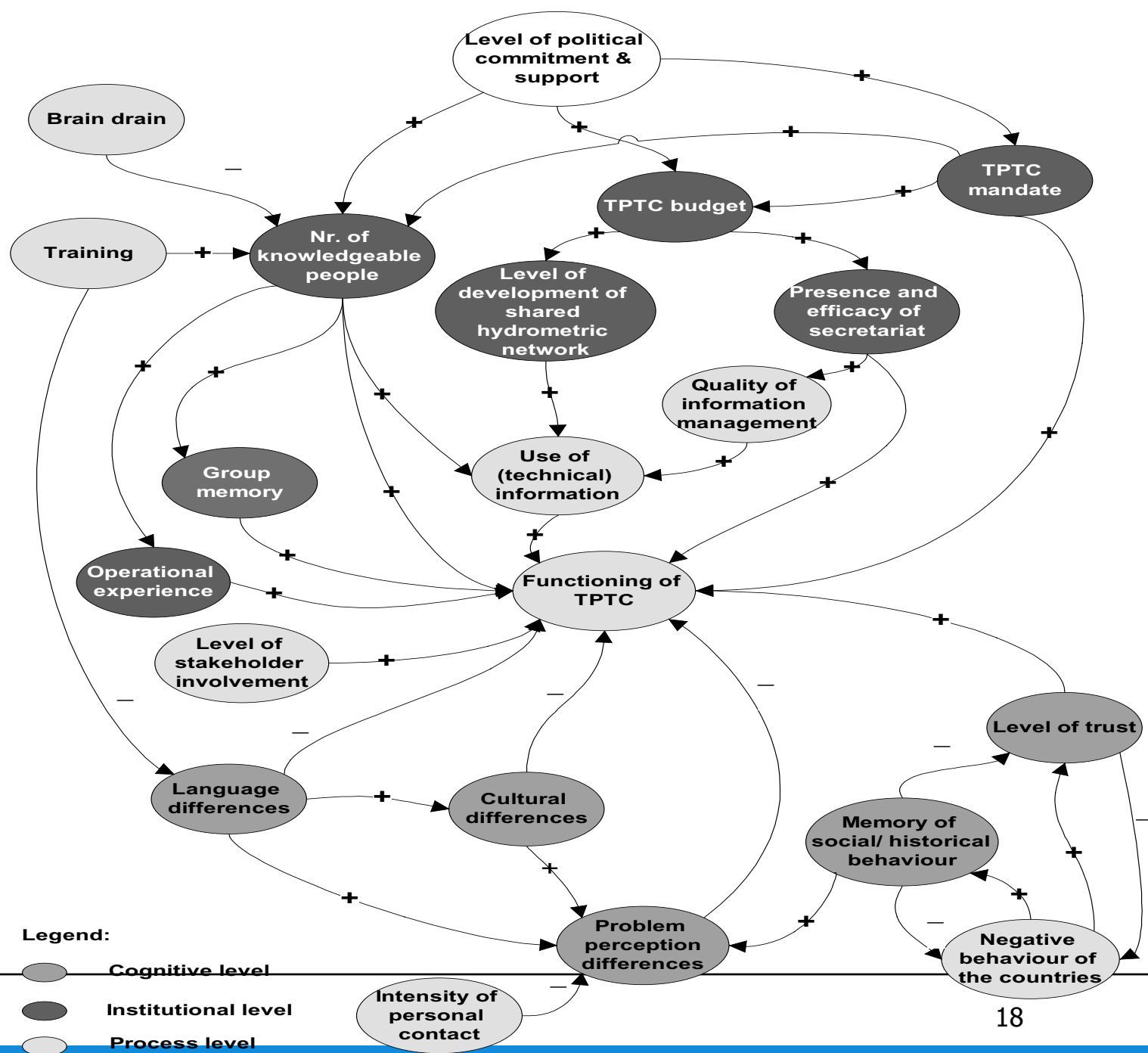
# Connecting governance, infrastructure and resource management over time

## Bigi Pan Multiple Use Management Area, Suriname



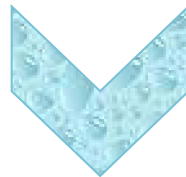
# Scale aspects in water governance





# Concluding...

- Governance of infrastructures is poorly researched so far
- Governance of infrastructures is different from governance per se
- Governance of infrastructures is different from infrastructure management/engineering
- Governance of infrastructures must take cognizance of environmental variability
- Governance of infrastructures can be understood more fully by building on existing theories and approaches and developing an appropriate analytical framework



**Governance of infrastructures needs research**