

International Conference on Integrated Water Resources Management

Dresden, 12-13 October, 2011

Towards Adaptive and Integrated Management Paradigms to Meet the Challenges of Water Governance

by

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How to purposefully design and implement adaptive and integrated water management and governance systems?

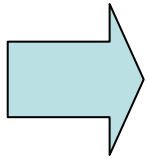
1 Theory and Concepts

2 Methodology

2.1 Participatory Model Building

2.2 Management and Transition Framework

3 Conclusions



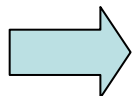
Management and Governance – What is the difference?

- Management refers to activities of **analysing, monitoring, developing, implementing measures** to keep the state of a resource within desirable bounds.
- Governance takes into account actors and networks that formulate and implement policy. The **governance system sets the rules under which management operates.**

Integrated Water Resources Management addresses the „**resource system**“, the „**management system**“ and the „**governance system**“.

Using management paradigms to analyze complex social-ecological systems

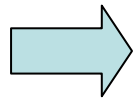
“A management paradigm refers to a set of basic assumptions about the **nature of the system** to be managed, the **goals** of managing the system and the **ways in which these goals can be achieved**” (Pahl-Wostl et al. 2011)

 Management Paradigms as an encompassing concept that arranges compatible system elements into a meaningful whole

Elements of Management Meta-Paradigms

	Prediction, control paradigm	Integrated, adaptive paradigm
Governance style	Centralized, hierarchical, narrow stakeholder participation	Balance between bottom-up and top-down processes, broad stakeholder participation
Information management	Understanding fragmented by gaps and lack of integration of proprietary information sources	Comprehensive understanding achieved by open, shared information sources
Infrastructure	Massive, centralized infrastructure	Appropriate combination centralized and decentralized

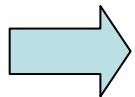
(Pahl-Wostl et al. 2011)



Differentiation between **Meta Paradigms** and **Sub-system Paradigms**

Sub-system Paradigms

- (1) ***System Perspective***: Related to specific sub-systems?
e.g., agriculture sector, environmental system, ...
- (2) ***Solution Strategies***: How are management problems solved? e.g., build dikes, allow for river-landscape flow, ...
- (3) ***Risk and uncertainty management approaches***: How are uncertainties and risks perceived and handled? Reduce uncertainties; accept uncertainties; uncertainty dialogue



Sub-system management paradigms as **cultural-cognitive institutions**

Sub-system specific management paradigms

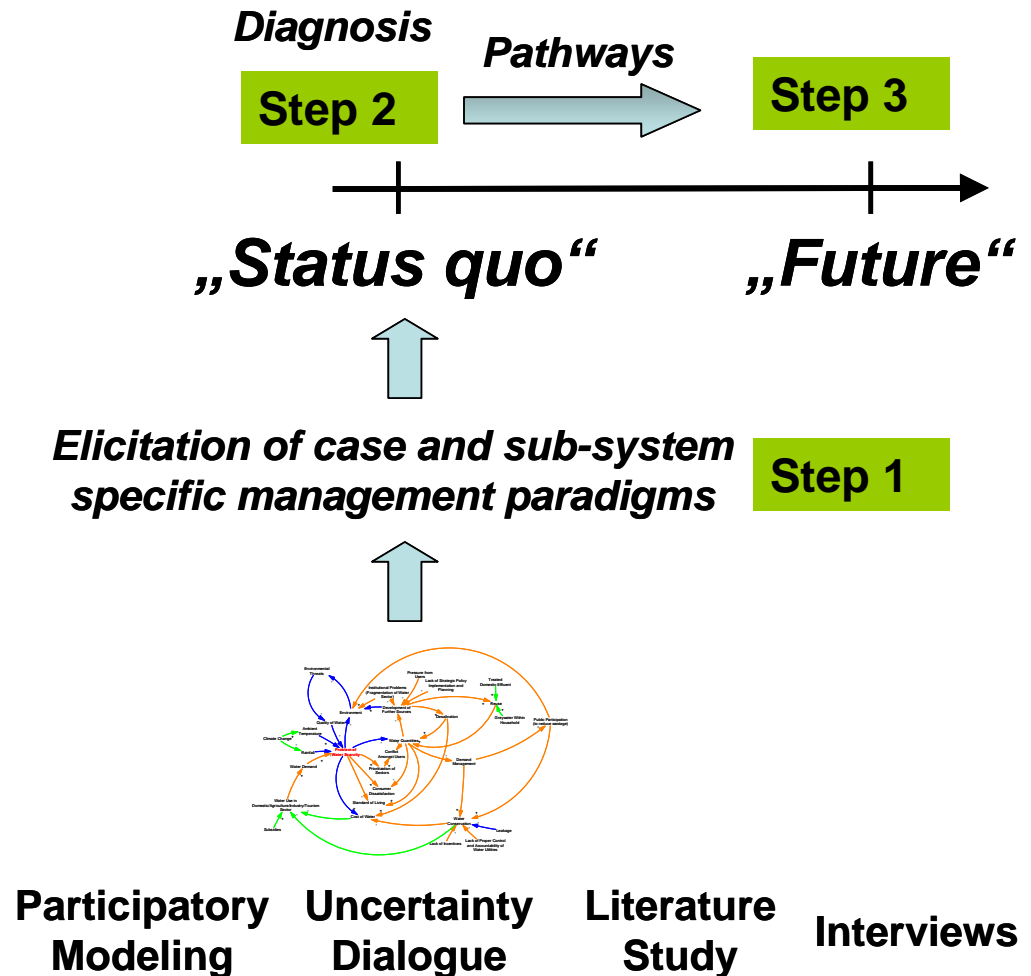
Name Dimension	"Control Floods" Paradigm	"Adapt to Floods" Paradigm	"Community Involvement" Paradigm	"Tradition" Paradigm	"Economies of Scale" Paradigm
System Perspective	River and protected values	Floodplain landscape	Flood prone communities	Small Farms	Big Farms
Solution Strategies	Build dikes	River-Landscape controlled flows	Community involvement	Traditional farming methods	Economies of scale; rationalization
Risk and Uncertainty Management	Reduction of uncertainty	Accept flood risk; Adaptive Management (through experimentation)	Uncertainty Dialogue	Build on the experience from the past	Reduce flooding risk and uncertainties

(Halbe et al., in prep.)

Methodology

MTF Analysis

- 1) **Elicitation of sub-system specific management paradigms** using participatory modelling
- 2) Analysis of management paradigms **embedded in the overall management and governance system**
- 3) **Visioning of pathways** towards adaptive and integrated water management



2) Analysis of management paradigms embedded in the overall management and governance system => Application of the MTF

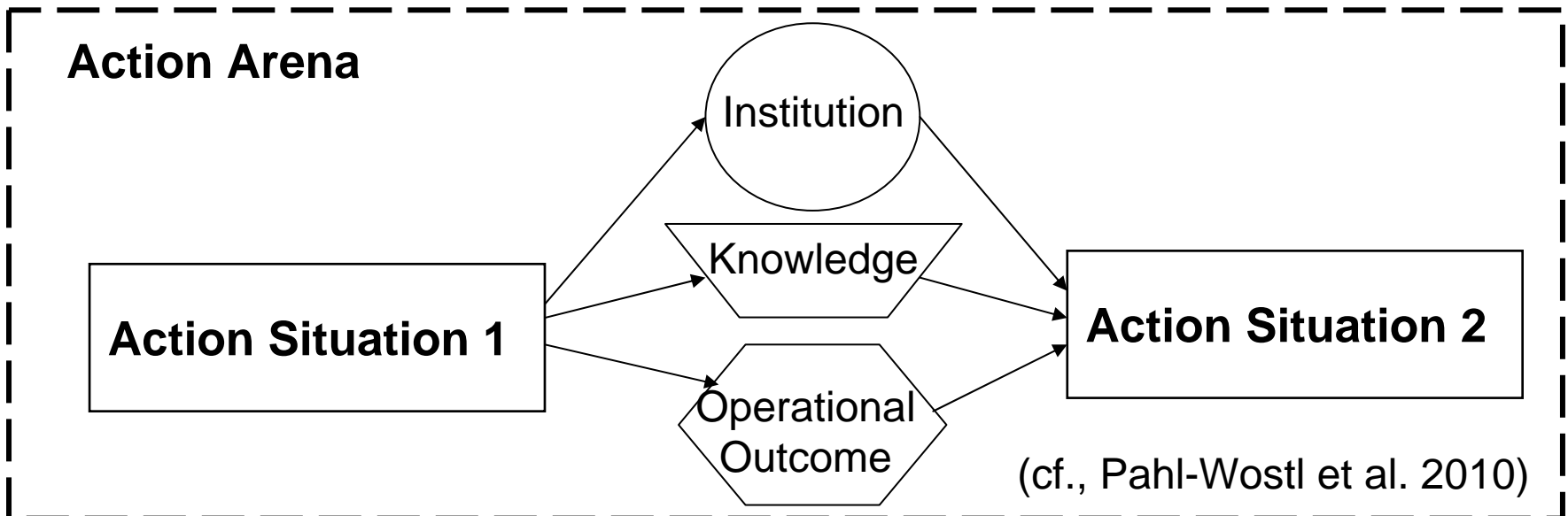
„**Action Situation**“: a **structured social interaction context** that leads to specific outcomes.

„**Operational Outcomes**“: e.g., direct **physical interventions** such as the implementation of infrastructure; **changes in societal characteristics** such as increased societal awareness for flood problems.

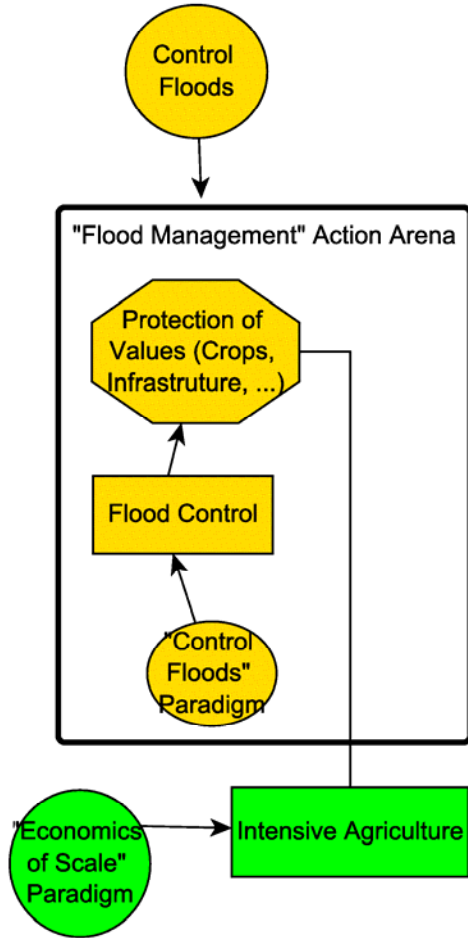
„**Institutions**“: **formal** (e.g. legislation) or **informal** (e.g. social norms; management paradigms) **rules** governing the behaviour of actors.

„**Knowledge**“: meaningful information and experience.

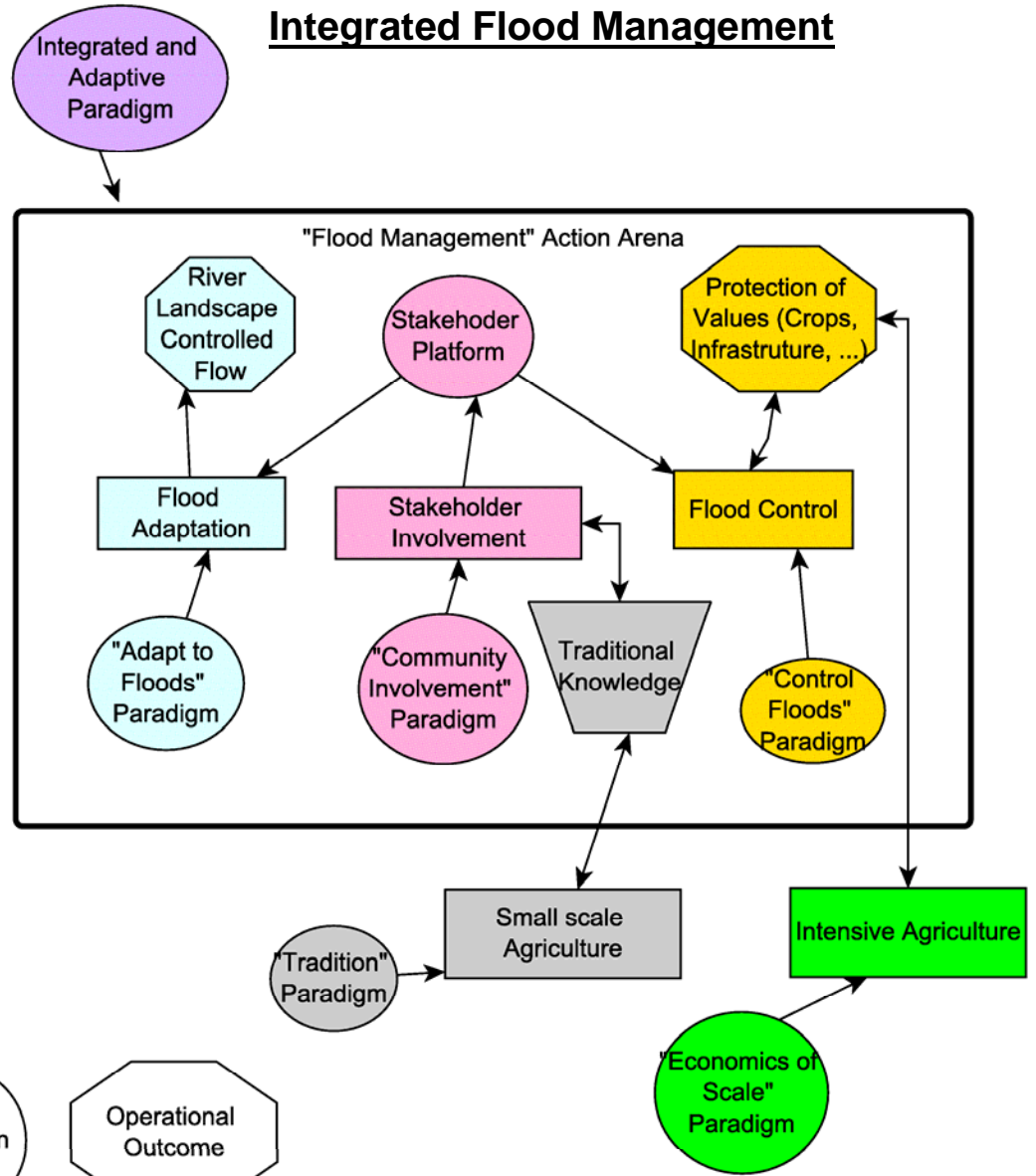
„**Action Arena**“: an **issue specific political arena** focused on a **societal function**, characterized by ‘actors’ and a number of ‘action situations.’



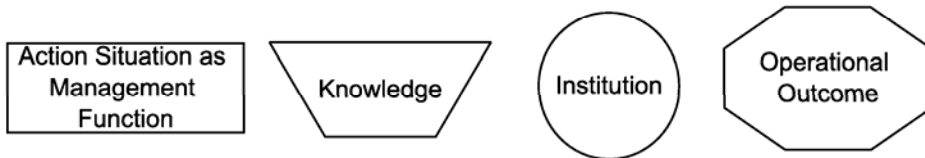
Hierarchical Management



Integrated Flood Management

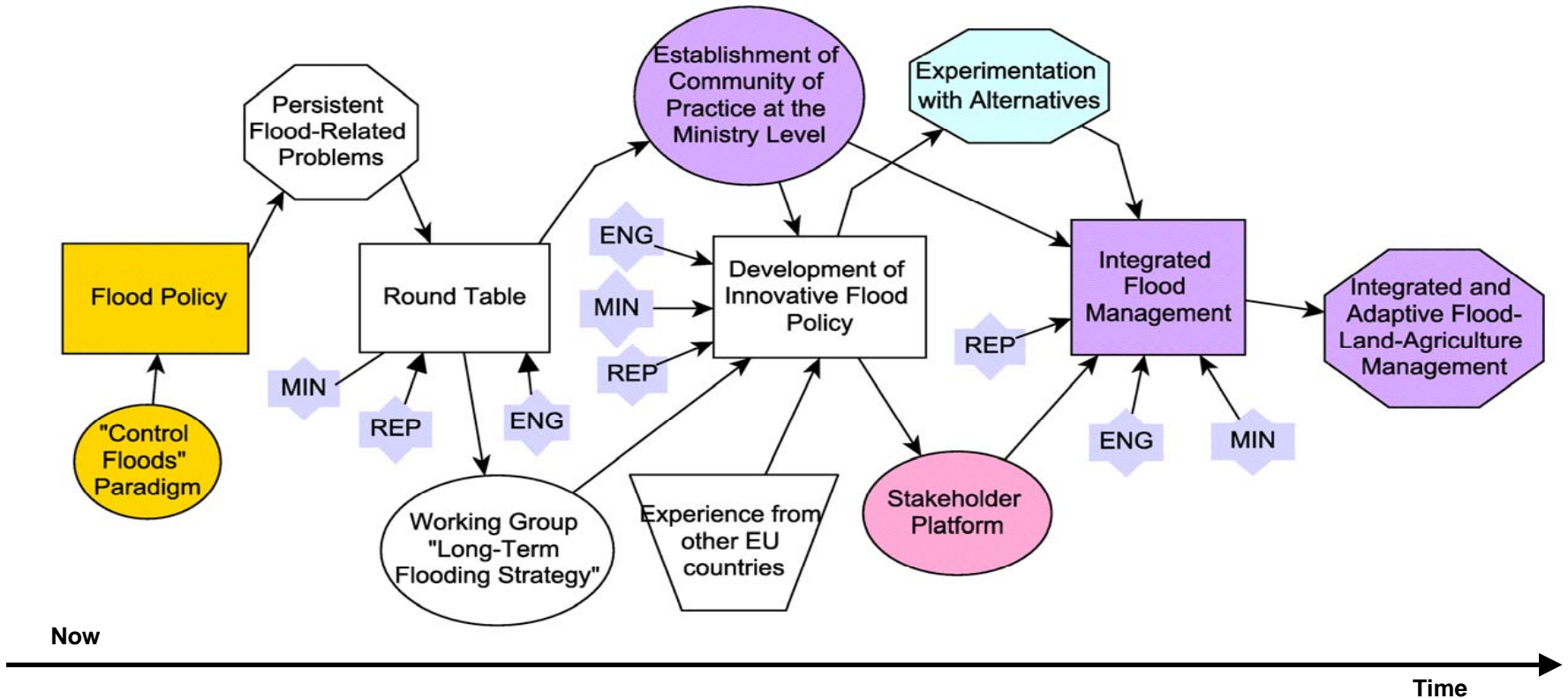


Legend:



(Halbe et al., in prep.)

3) Visioning of pathways



Legend:



(Halbe et al., in prep.)

Conclusions

Methodology linking analysis of the governance system and participatory model building for:

- a) Participatory analysis of **interlinkages of resource, management and governance system**
- b) **Visioning** of sustainable management and governance systems
- c) **Design of pathways** towards desired future system states

Future Research

Empirical research needed to evaluate the **applicability and effectiveness** of the proposed methodology in **different water management contexts**

Examination of **concrete sets of management paradigms** that support **integrated and adaptive water resources management**.

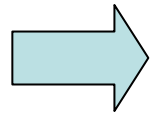
Thank you very much for your attention!

Cited Literature

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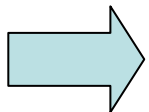
Conclusions

Methods and tools have to **deal with complexity** of water management and governance in order to avoid resorting to **simplistic solutions or panaceas**



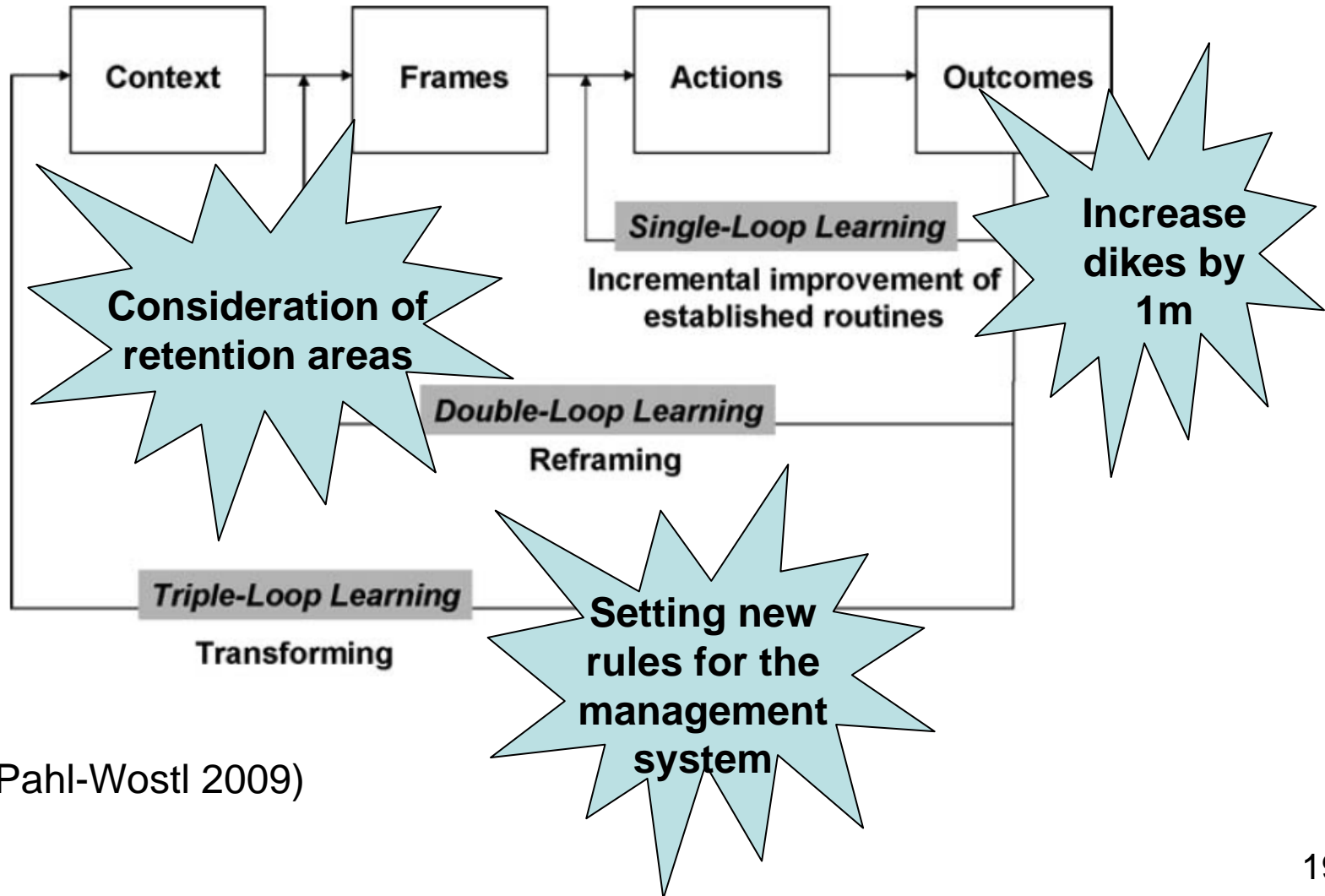
Diagnostic approach by using the Management and Transition Framework (MTF)

Effective **science-policy-community dialogues** are needed to **initiate learning processes** between science, policy-makers and local communities



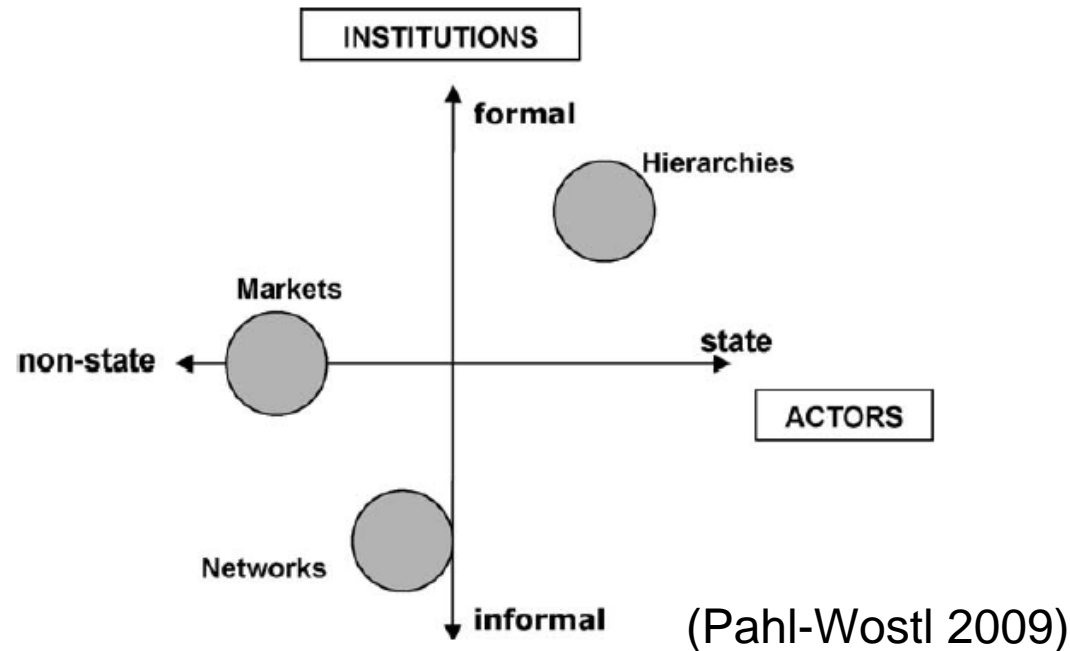
Action Research by using Participatory Model Building

Triple Loop Learning Concept



(Pahl-Wostl 2009)

What are the **properties** of sustainable governance and management systems?



Diagnostic approach needed that

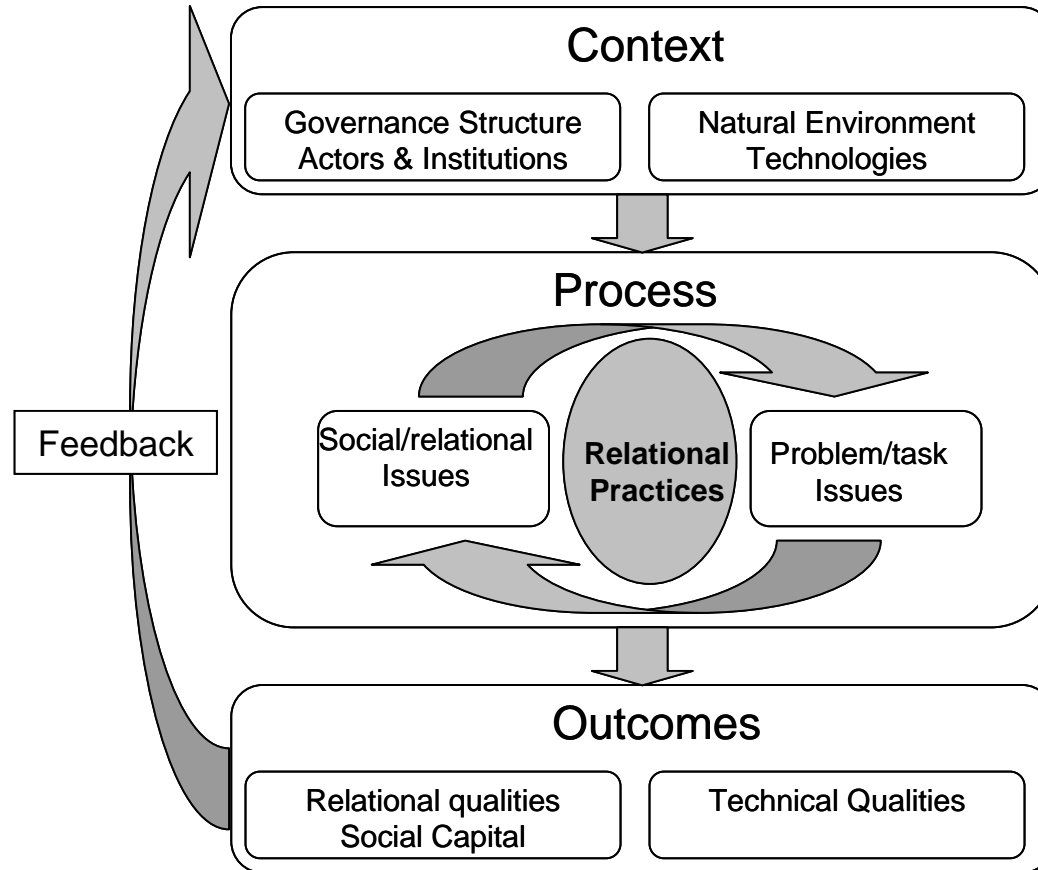
- (1) allows for systematic analysis of management and governance systems
- (2) takes uncertainties and complexity into account by including stakeholders

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(Halbe et al., in prep.)

Design and implementation of adaptive and integrated water management and governance require learning of actors and changes in institutions...

Processes of Social and Societal Learning



Conceptual framework for water resources management
(Pahl-Wostl et al., 2007)