Enhancing water security to the benefits of humans and nature – a multi-level governance challenge

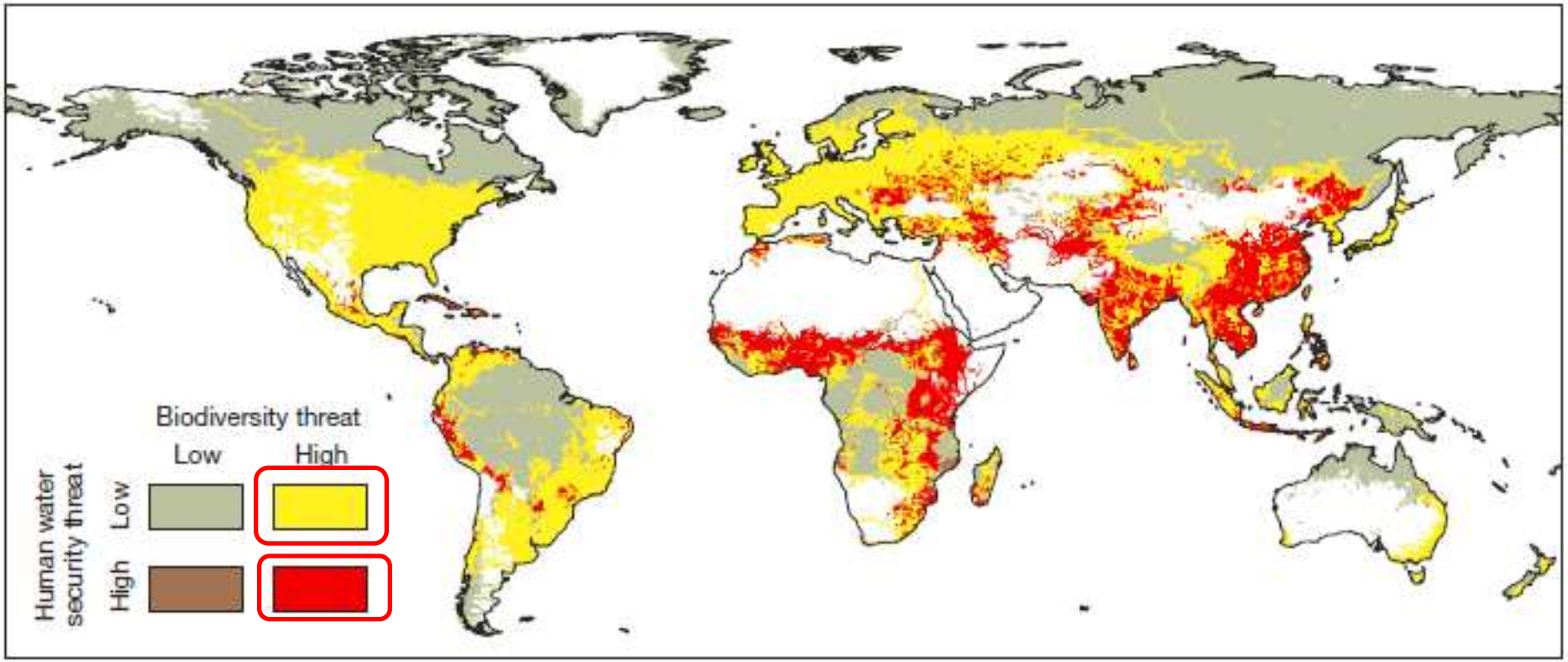
Claudia Pahl-Wostl

Professor for Resource Management

University of Osnabrück, Germany

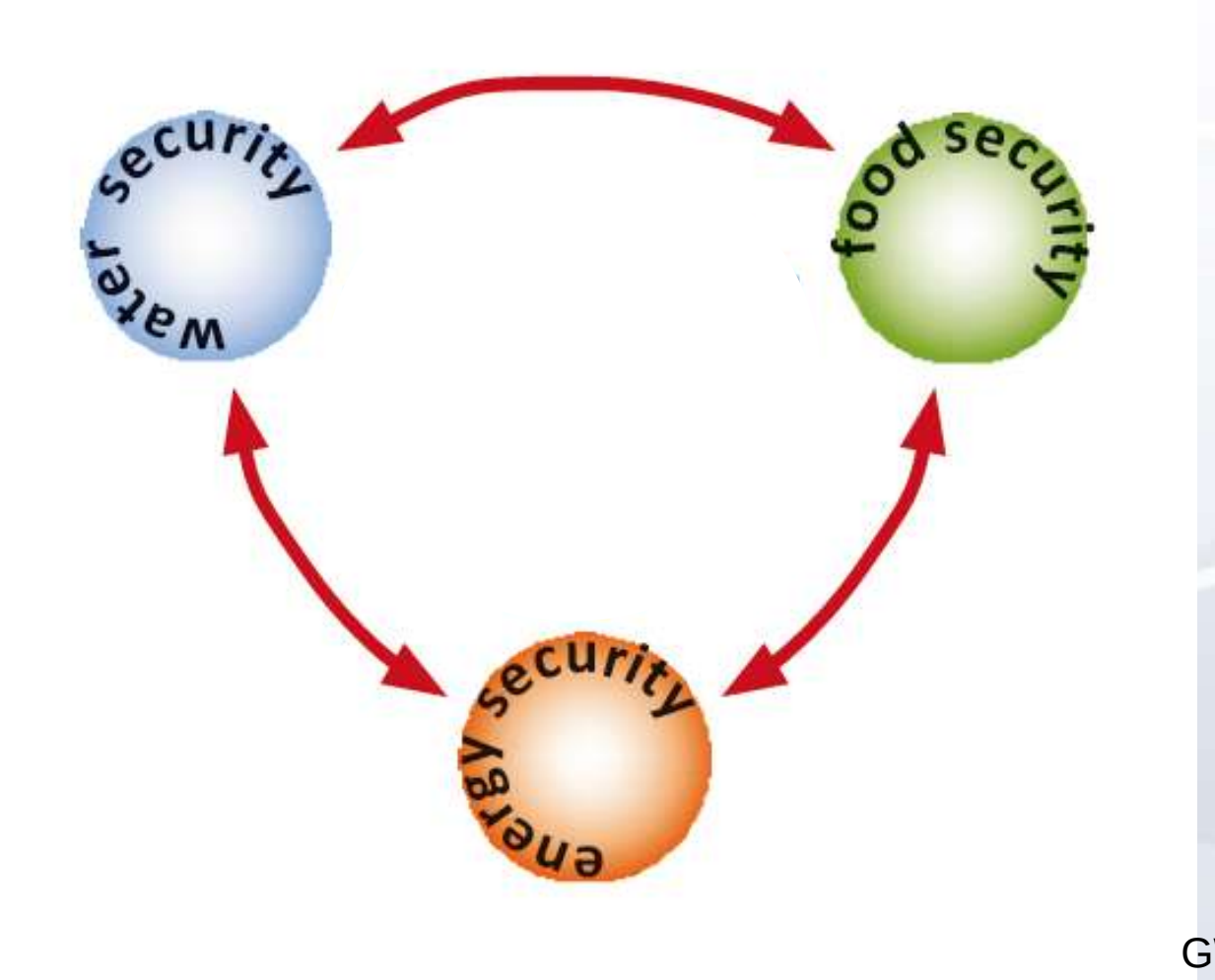
Co-Chair Global Water System Project

Prevailing patterns of threat to human water security and biodiversity



Vörösmarty et al, 2010, Nature

Water-Food-Energy-Nexus more attention to environment!



Some guiding statements

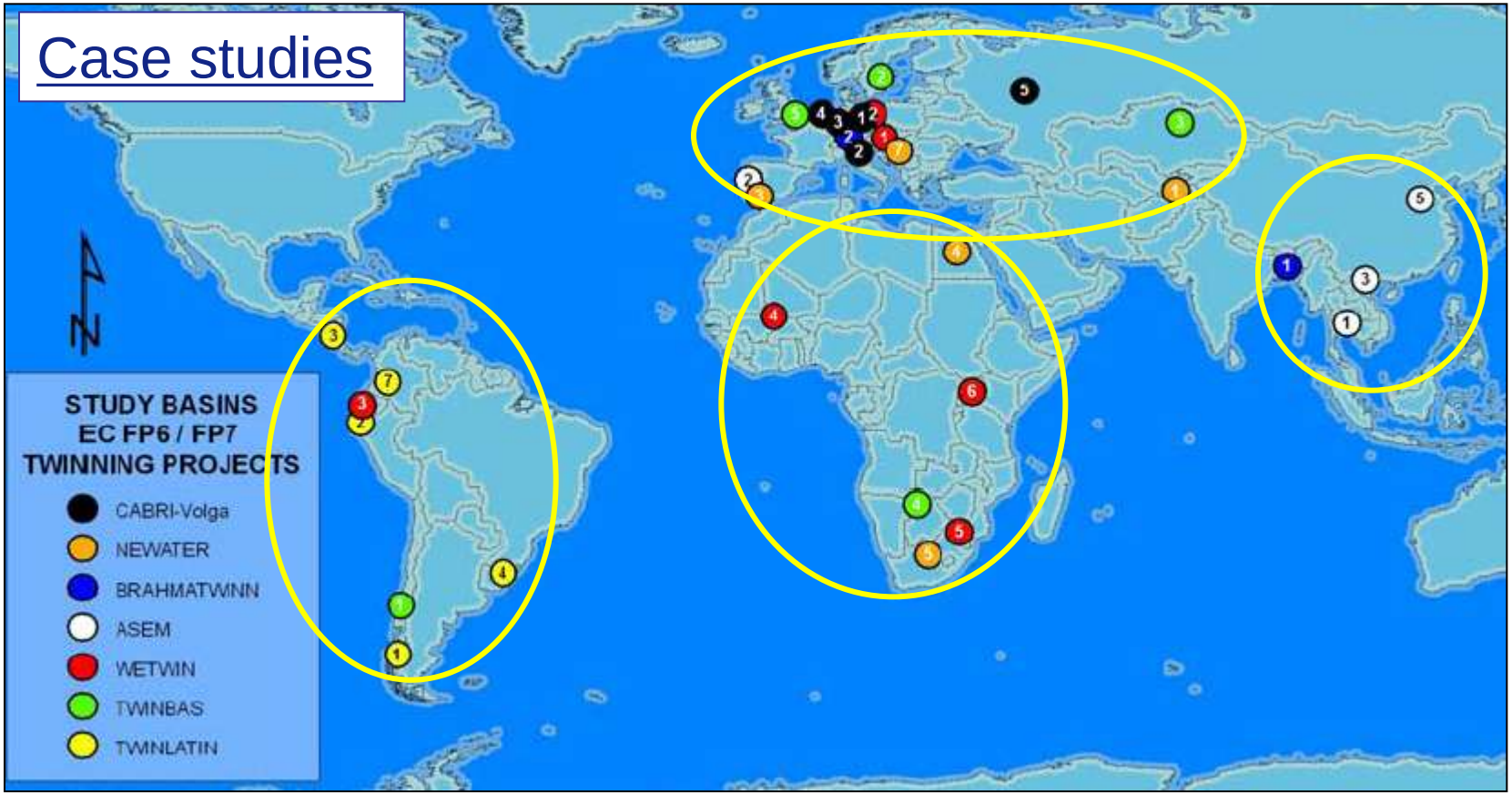
- ***Human water security has often been achieved to the detriment of the environment***
- ***and with negative, sometimes irreversible impacts on the resilience of social-ecological systems as a whole***
- ***Good governance essential to enhance water security without jeopardizing sustainability***
- ***Need to move from discourse to effective structural change***

From applying panaceas to mastering complexity: Comparative analyses of water governance systems

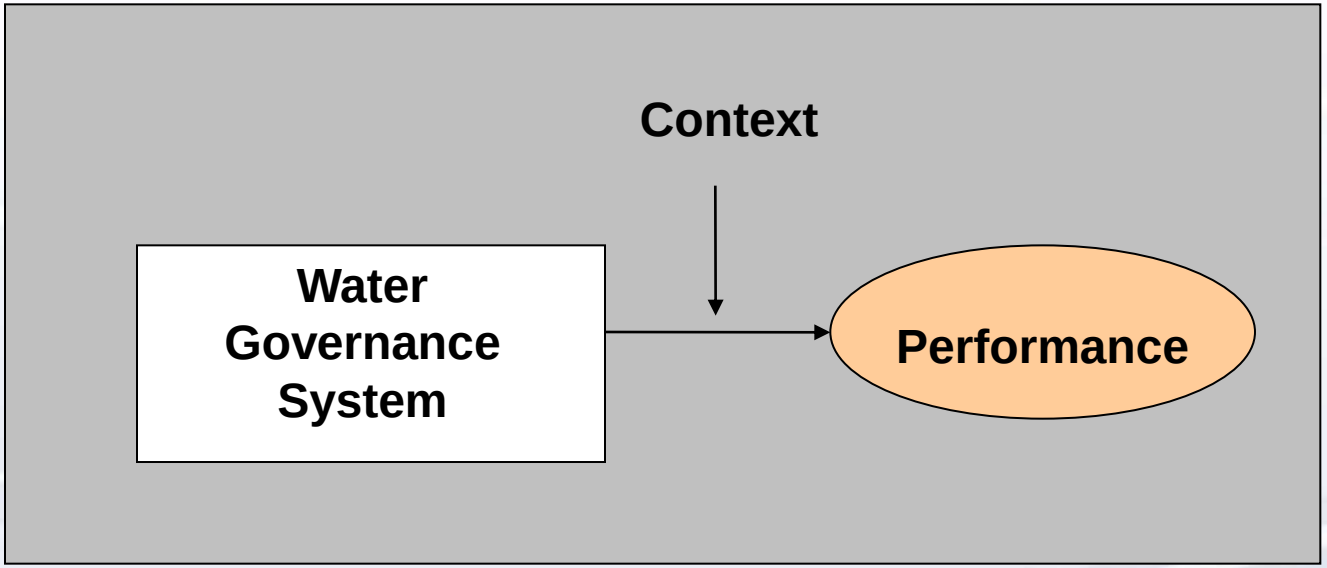
Earth System Science Partnership

Projects & Case Studies

GWSP Global Water System Project

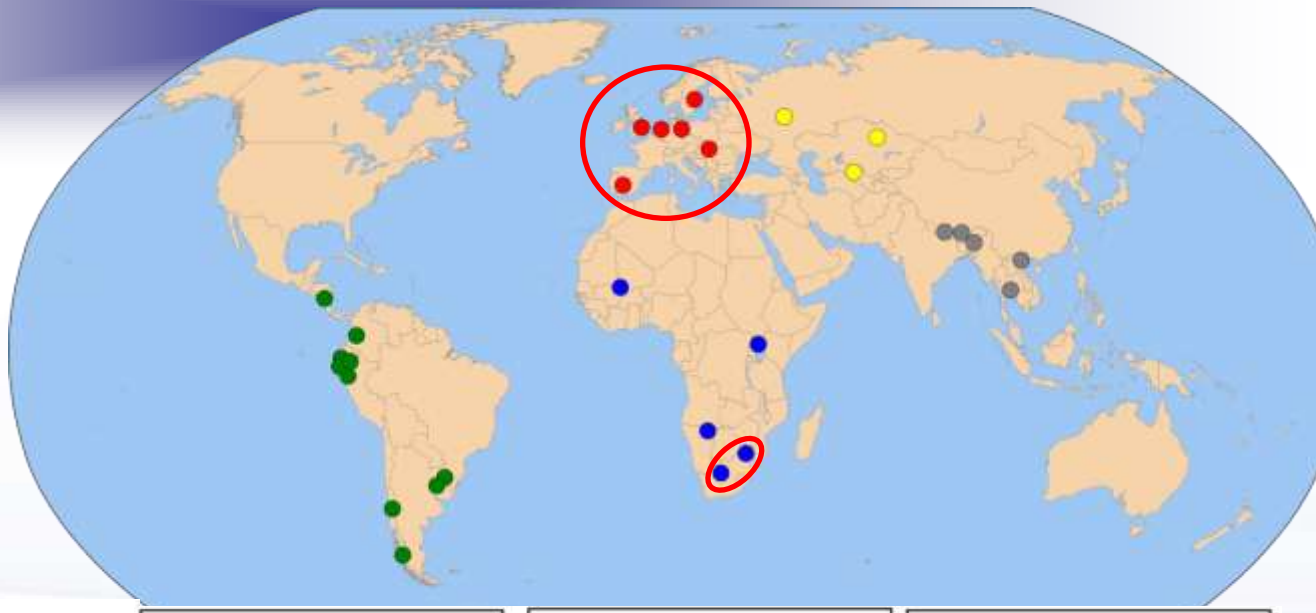


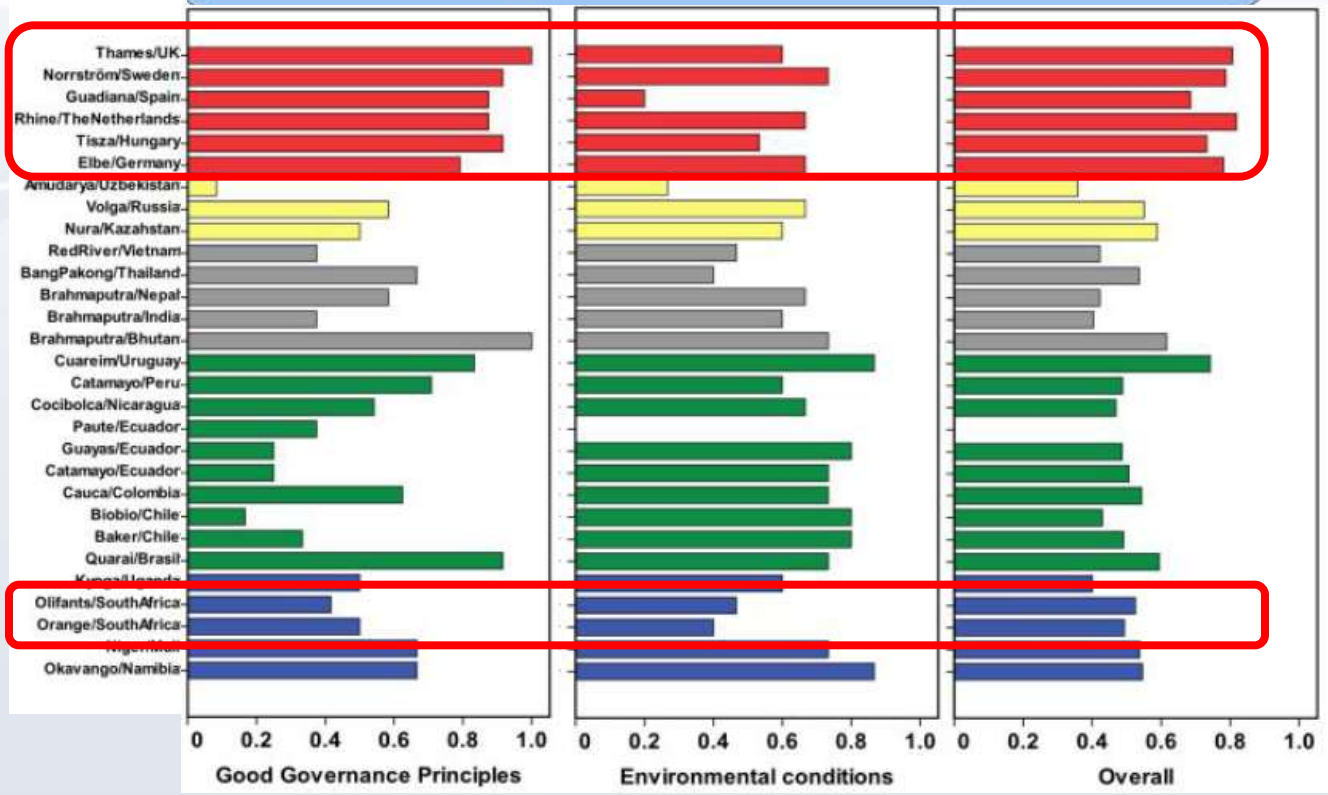
Framework of analysis for diagnostic approach



…. analyse how certain characteristics of a water governance system influence its performance and how this is affected by the context in which the system is embedded

Performance in geographic regions





Insights Twin2Go
Governance System -> Performance

- *No support for simple recipes (panaceas)*
- *Regulatory frameworks necessary but not sufficient*
- *Direction of relationship rarely entirely changed by context – but context important to explain variation*

  -> Transfer of guiding principles that can be tailored to context
- *Adaptive capacity (CC adaptation) strongly related to polycentric governance, knowledge management and innovative ways for dealing with uncertainty*
- *Economic development leads to fulfilling needs of human population but to a much lesser extent of the environment*
- *Cases where rivers are (still) in good condition have often poor governance and management systems*

From applying panaceas to mastering complexity: Toward adaptive water governance in river basins

Claudia Pahl-Wostl[a,*], Louis Lebel[b], Christian Knieper[a], Elena Nikitina[c]

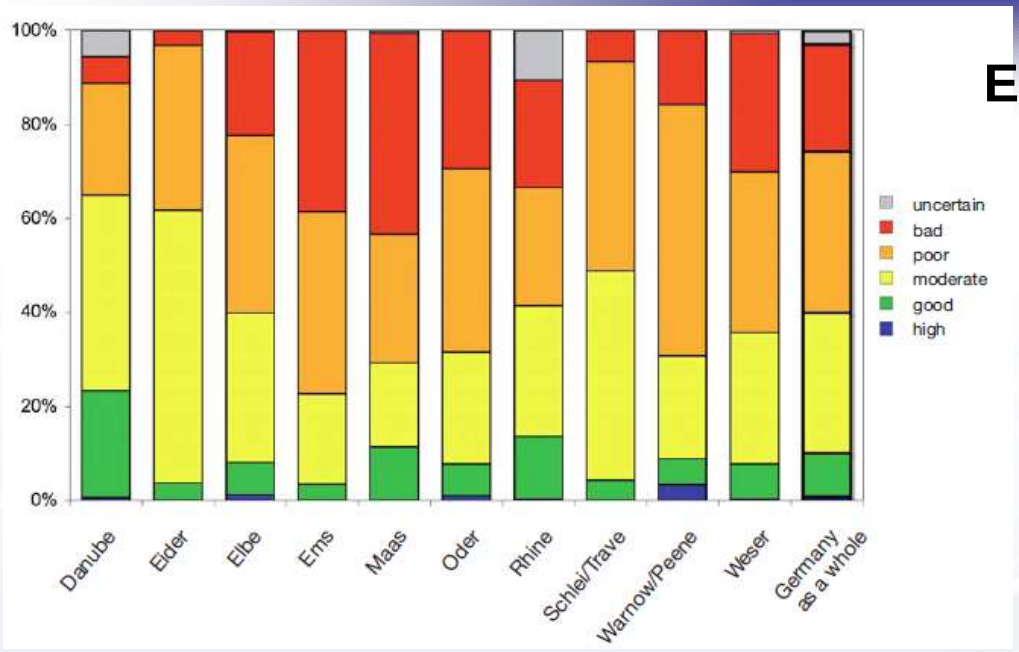
ENVIRONMENTAL SCIENCE & POLICY 23 (2012) 24–34

Importance of societal learning:

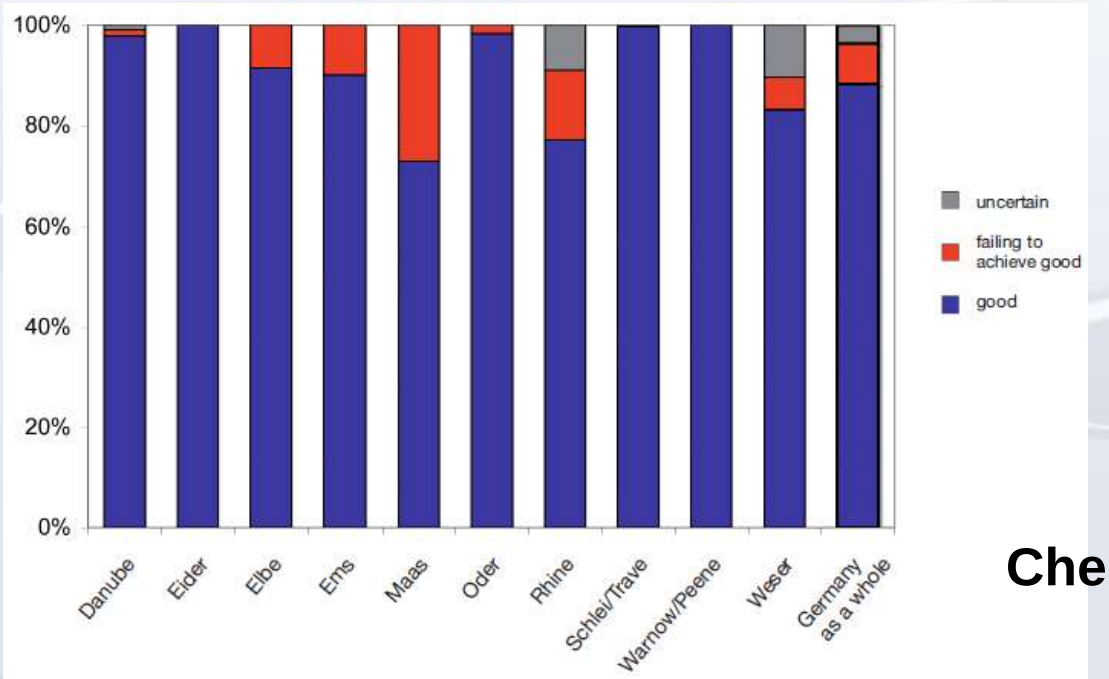
Paradigm shift towards integrated flood management in Europe

WFD - Classification of Surface Waters in Germany

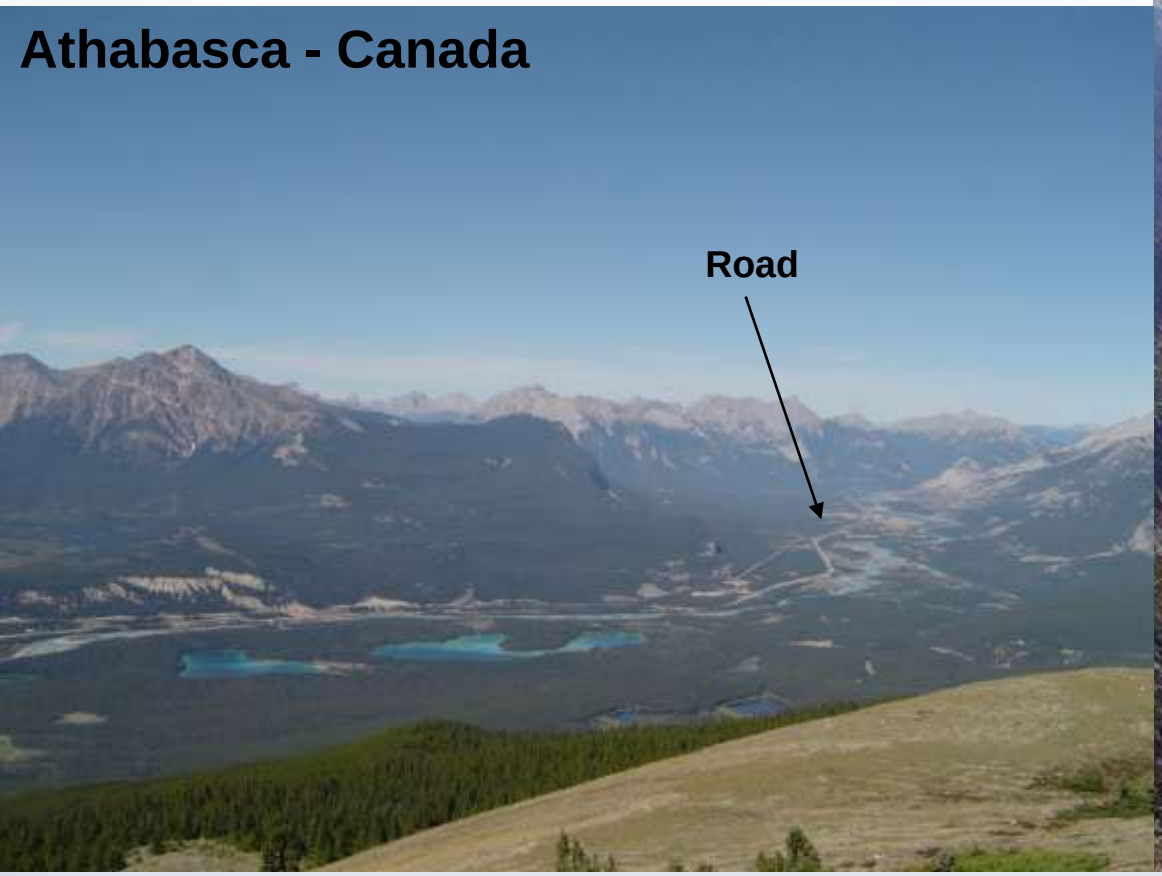
Ecological Status



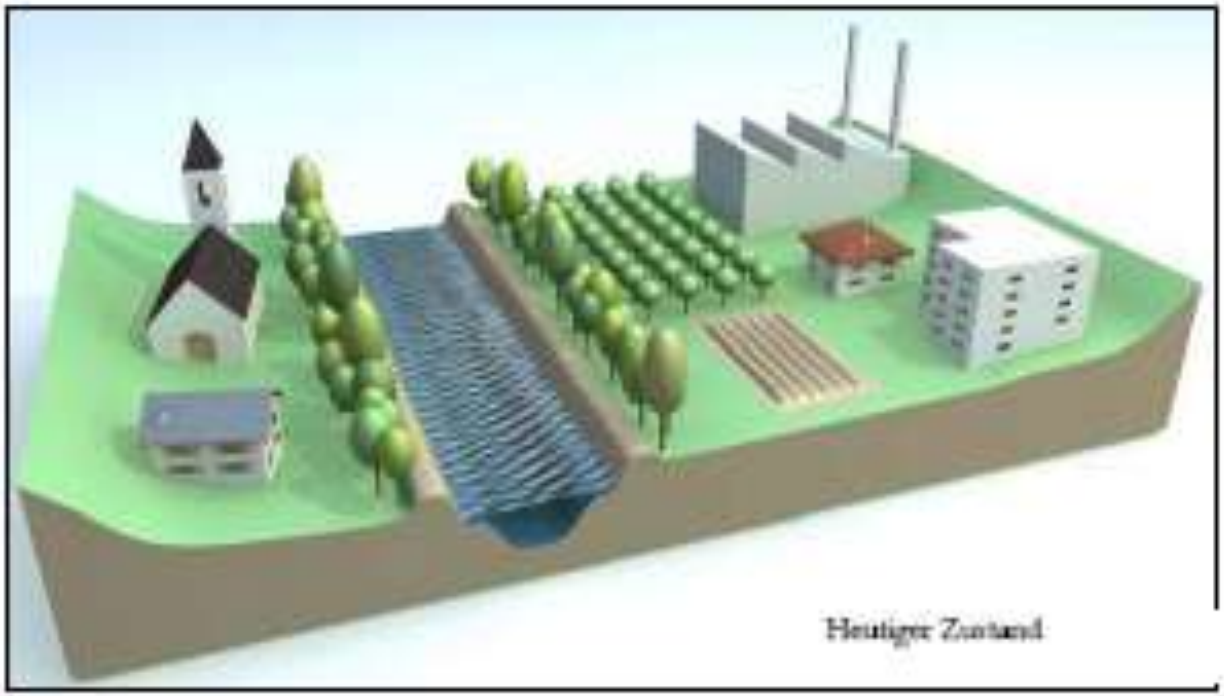
Chemical Status

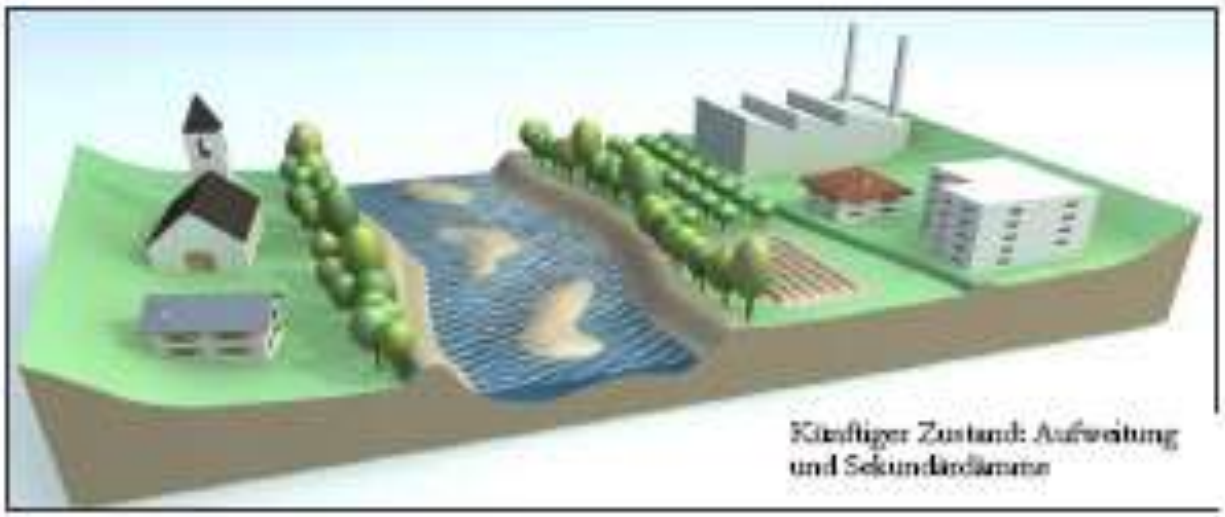


Rivers as water highways…..



Competition for space – use conflicts





2005 – Public Consultation Planning Document 3rd Correction Rhone Switzerland

From Flood Protection to Integrated Flood Management: A multi-level societal learning process towards sustainability

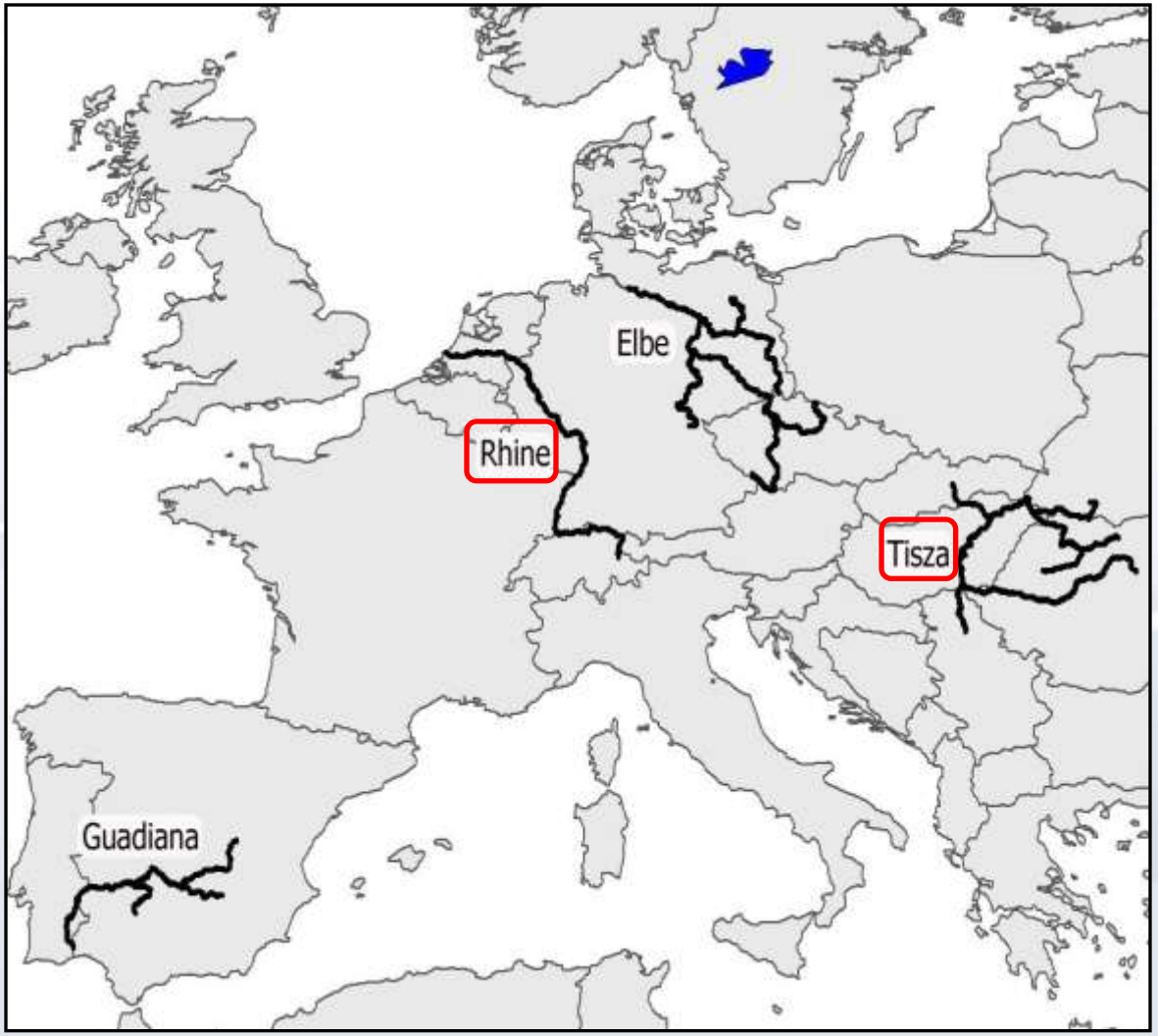
Pahl-Wostl, Becker, Knieper and Sendzimir,

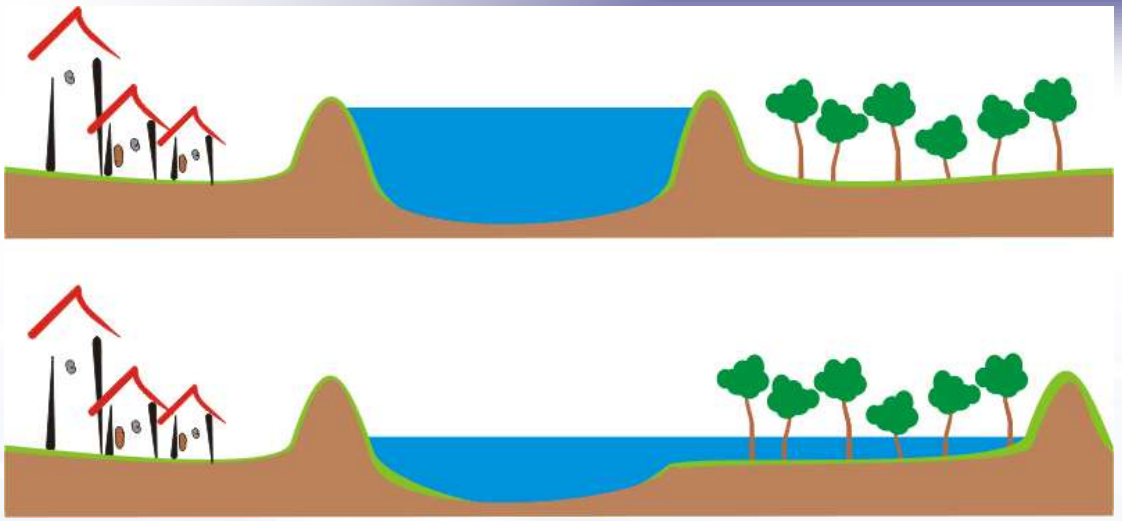
in review

Transformation of flood management paradigm

Currently dominating „Controlling water"	New approach „Living with water"
Risiks are quantified and optimal technical solutions are implemented	Participatory risk evaluation and negotiation about integrated solutions
Large-scale technical infrastructure (reservoirs, dams)	Multi-functional landscape with flooding areas combining ecosystem services approach and technical infrastructure

Three National Basins





Space for water - climate adaptation as opportunity for innovation

Dutch National Research Programme on Climate and Climate Related Knowledge Infrastructure (2004-2011)

The Integrated Rhine Programme

Flood control and restoration of former floodplains along the Upper Rhine

Baden-Württemberg

UMWELTMINISTERIUM

The Upper Rhine retention areas down to Mannheim

Comprehensive studies conducted over a period of several years have revealed that each of the proposed retention areas is suitable for the purposes of flood retention and the restoration of semi-natural floodplain conditions. However, not all sites will enjoy an optimum achievement of both objectives.

A mathematical flood discharge model was used for the purpose of verifying whether the measures laid down in the Framework Concept of the Integrated Rhine Programme – in conjunction with the measures taken in France and Rhineland-Palatinate – would actually entail the required level of efficiency.
The relevant findings speak for themselves and underline the importance of achieving the set targets.
For this purpose, all sites embracing an overall volume of 167.3 m m³ which are proposed in the Framework Concept for the Integrated Rhine Programme, will be required.

Mannheim
Waldsee
Kollerinsel
Rhineland-Palatinate
Neckar
Flotzgrün
Mechtersheim
Rheinschanzinsel
Elisabethenwört
Wörth/Jockgrim (Neupotz)
Karlsruhe
Daxlander Au
Bellenkopf/Rappenwört
Rastatt
Moder
France
Söllingen/Greffern
Strasbourg
Freistett
Kehl/Straßburg weir
Altenheim
Erstein
Offenburg
Baden-Württemberg
Ichenheim/Meißenheim
Emergency operation of the power stations on the Rhine (loops)
Elzmündung
Wyhl/Weisweil
N
Breisach/Burkheim
Freiburg
Breisach weir
Weil – Breisach
Rhine
Basle

Integrated Rhine Programme Baden-Württemberg

- retention facilities (Baden-Württemberg)
- retention facilities (France and Rhineland-Palatinate)
- dam relocations proposed from an ecological point of view
- present alluvial floodplains (including areas of the emergency operation of the power stations south of Straßburg)

0 10 20 30 km

Polder Elzmündung: Begründungen werden abgelehnt

Das Landratsamt (LRA) weist die Einwände gegen den Bau des Polders Elzmündung zurück.

2009

Das Schild am Ortseingang von Allmannsweier verblasst allmählich, aber das Thema ist weiterhin aktuell. Foto: Ulrike Derndinger

Der Kampf für eine verträgliche Retention Breisach-Burkheim geht weiter

Bei einem gemeinsamen Ortstermin in den Rheinauen zwischen Breisach und Burkheim erläuterten Gemeindevertreter, Gewässerexperten und Mitglieder der gleichnamigen Bürgerinitiative, wie sie sich eine für Mensch und Natur verträgliche Retention vorstellen.

Auch im Burkheimer Quelltopf hat sich bereits viel Schlamm abgesetzt.

Vor dem Wasser kommt die Klageflut

Wie ökologisch verträglich lässt sich ein Polder fluten? Die Antwort wird auch über das Schicksal des Integrierten Rheinprogramms entscheiden.

Protestschild in Schwanau Foto: dpa

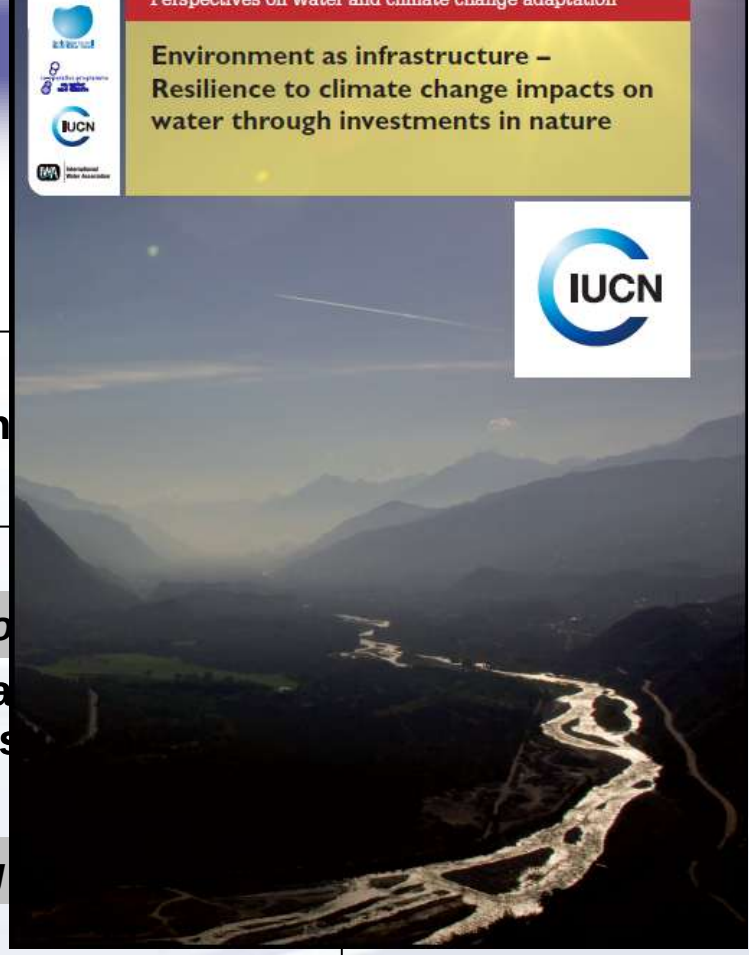
2010

Was bleibt von der Natur übrig?

Das Verwaltungsgericht Freiburg befasst sich mit den mehr als 100 Klagen gegen den Überschwemmungspolder Elzmündung.

Umgeben von Aktenbergen verhandelt die zweite Kammer des Verwaltungsgerichts mit dem Vorsitzenden Jens Michaelis (Zweiter von links) über den Polder Elzmündung.

An evolutionary perspective



Context → Frames → Action

Single-Lo

Incrementa
establis

Which laws need to be changed?
Change in practices, entrenched beliefs - paradigm shift in education?

Double-Loop Learning

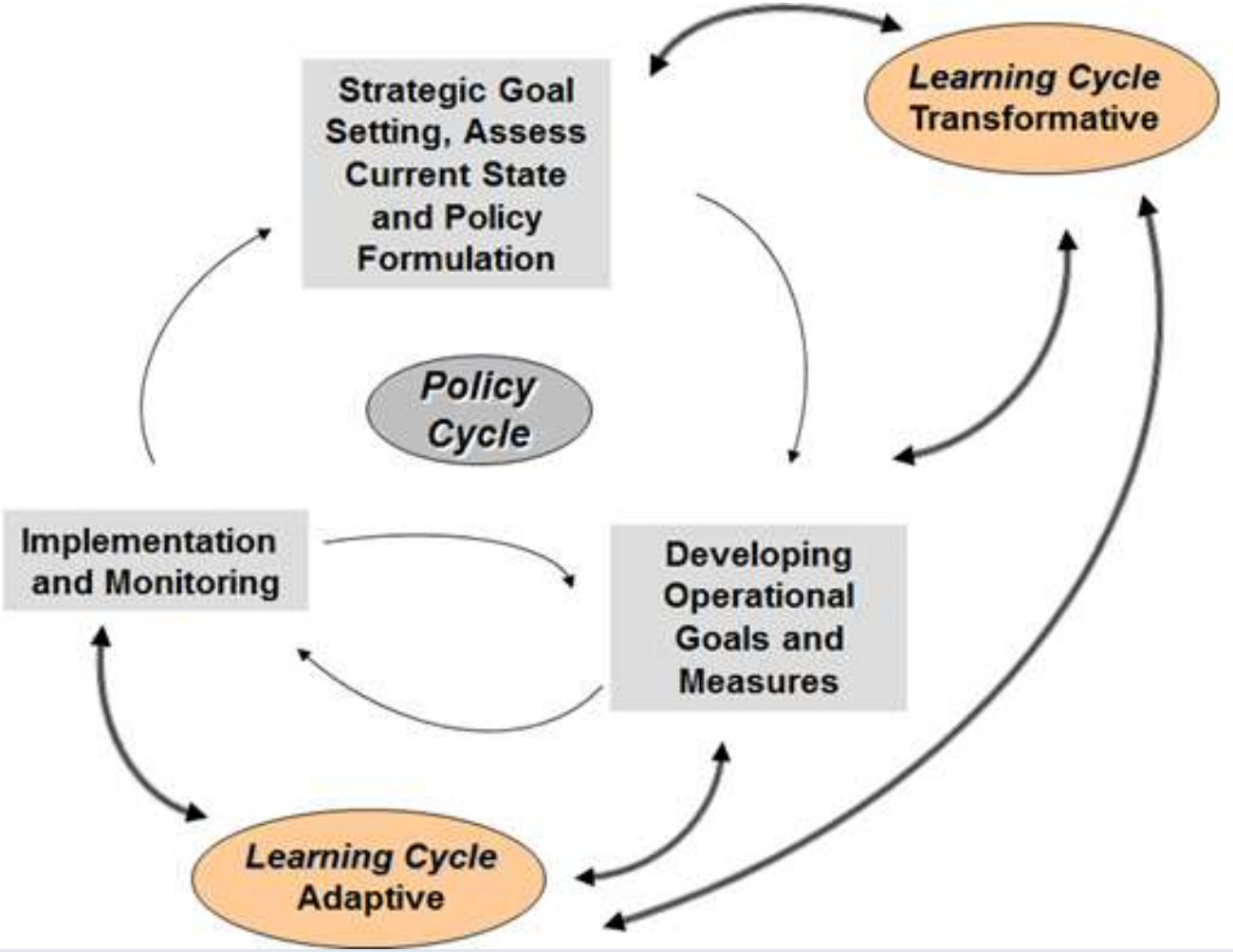
Reframing

Triple-Loop Learning

Transforming

Is present flood protection practice sustainable?
How can one increase the resilience of landscapes / regions?

Different levels of learning and policy cycle



Some elements of the case comparison

	Tisza HU	Rhine NL	Rhine D
Informal learning process	Driven by informal bottom-up process, shadow network.	Expert communities - actors from government, science, business develop alternative approaches. Local ad hoc advocacy coalitions oppose implementation projects. .	Expert communities - actors from science and government develop alternative approaches. Local ad hoc advocacy coalitions oppose implementation projects.
Multi-level structure	National dominance. Shadow network effective in bridging levels	National dominance. Key governmental organization (RWS) links levels.	Federal system with autonomy at state level. National level comparatively weak.
Learning process outcome – change in paradigm	Discourse advanced and coordinated by shadow network. Partly implementation in formal policy process but weak implementation in management practice.	Discourse advanced, long-term strategic planning. Increasing implementation in formal policy and management practice.	Discourse emerging but hardly coordinated across levels or groups. Partly implementation in policy and weak coordination in management practice.

Major insights

- **Results confirm importance of informal learning and actor networks and their connection to formal policy processes.**
- **Enhancing society's capacity to adapt is a long-term process evolving over decades, punctuated by disastrous flood events that promote (or facilitate) windows of opportunity for change.**

Enhancing water security to the benefits of humans and nature – a multi-level governance challenge

Governance at different levels

- **Global**
  - *management paradigms, norms – epistemic communities*
  - *Global UN conventions*
  - *Global market developments*
- ***Supra-national legislation - e.g. EU – Framework Directives***
- ***National/province***
  - *Harmonization with higher level legislation, harmonization between (sectoral) policy fields*
  - *Discourse on norms and paradigms*
- **Regional - local**
  - *operational implementation, collaborative and cross-sectoral plannig*
  - *citizen initiatives, pilote experiments*

Interaction of different governance modes

- **Governmental regulation – formal regulations, subsidies**
- **Market based approaches - pricing, PES schemes**
- **Discourse, social learning in informal networks, norm diffusion**

The way forward

- *Comparative analyses of water governance and management systems to identify requirements for (transformation towards) adaptive and sustainable water management*
- *Development of context-sensitive policy advice to support sustainable transformations towards enhanced water security*
- *Build global learning network of transition basins*