

The water transition

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- The nature of the water problem
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The water problem

- Floods 1993 & 1995, 1998
 - Drought 2002, 2003
 - Financial damage
 - Ecological degradation
- Increasing pressure from land on water
- Increasing pressure from water on land

Decreasing room for increasing water volume

The Persistent Water Problem

- Complexity
 - Multiple manifestations & Multiple functions
- Uncertainty
 - Different Perspectives
- Governance problems
 - Stakes & Multiple values
- Path dependency
 - Attuned subsystems

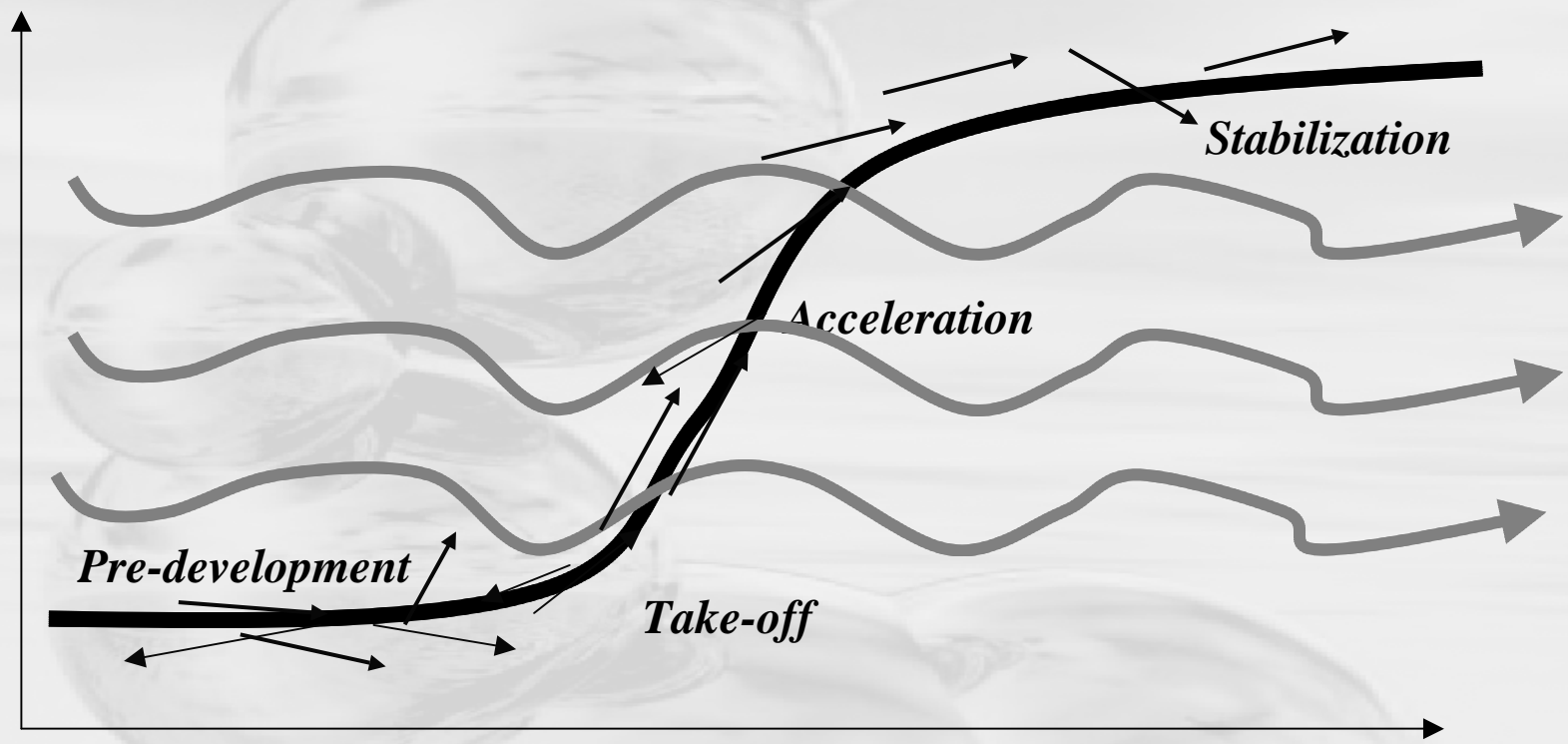
Transitions

A transition can be defined as a long-term transformation process in which society, or a complex sub-system of society, fundamentally changes.

A transition is the result of interacting technological, economical, ecological, cultural and institutional developments at different scale levels. (Rotmans e.a. 2004)

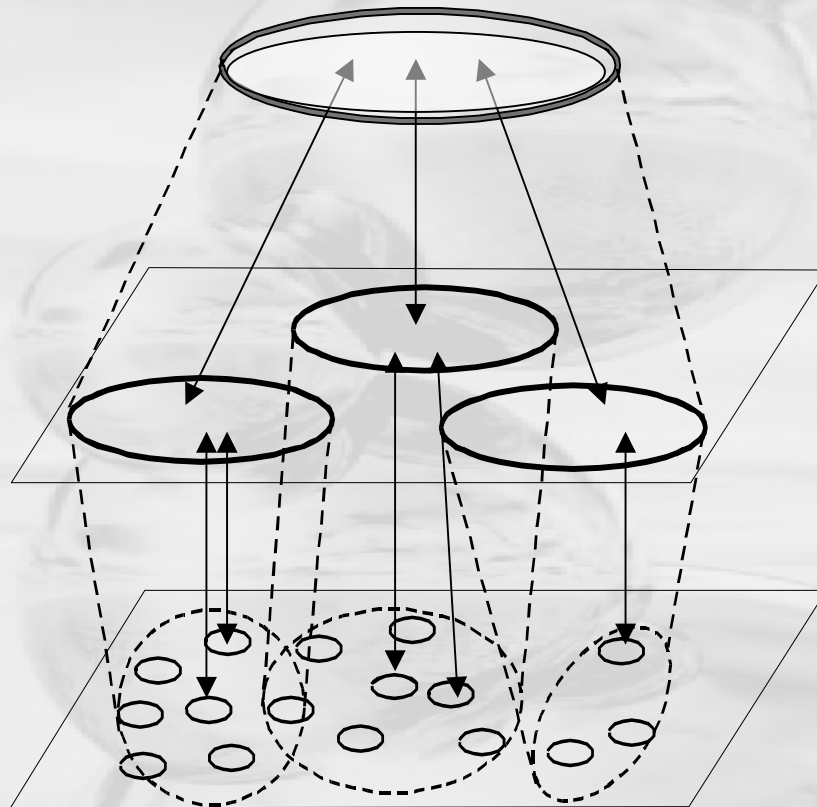
Multi-phase

Indicator of systems change



Time

Multi-level concept



Macro: *slow societal trends and developments: political culture, worldviews, paradigms, demography*

Meso: *social norms, interests, rules and belief systems that determine strategies of institutions and organizations*

Micro: *niche-level at which individual actors operate*

Based on Geels & Kemp, 2000

Complex system properties

- Co-evolution
 - Irreversible change as result of interacting components
 - Critical thresholds are reached
- Emergence
 - Higher level patterns emerge unexpectedly from component-interaction
- Self-organization
 - Spontaneous re-organization of the system

Existing relationships between variables change...

Existing relationships may even disappear...

New relations & variables may appear...

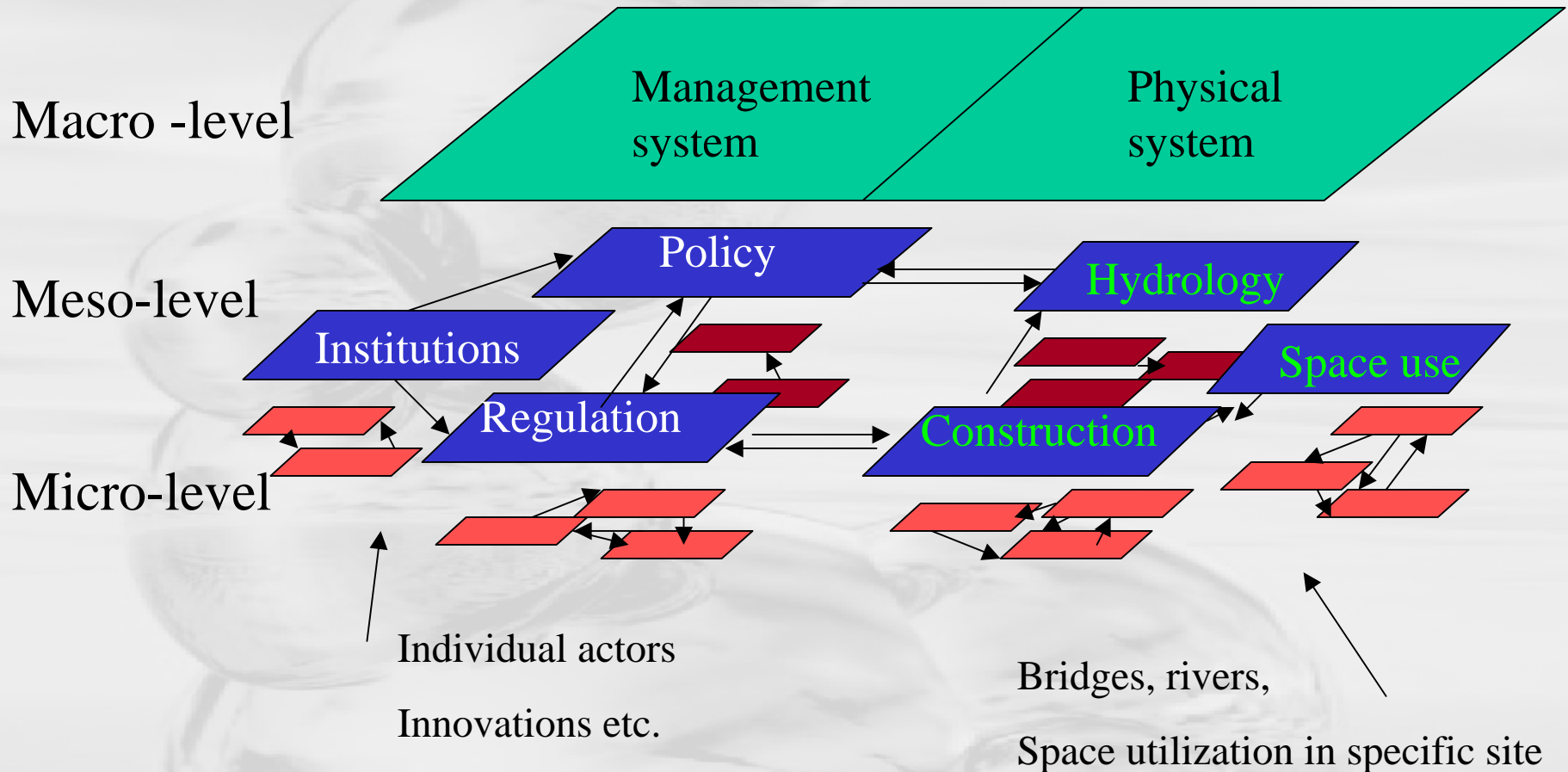
Attractors

- Attractor
 - Attracting the system
- Multiple attractors
 - Different system organizations
- Stability domains
 - Resilience
- Societal Attractors
 - Direction of the regime

The Water Transition (1)

- Shift in water management since 1970's
 - Between to water management attractors
- Qualitative longitudinal research (1970-...)
 - Interviews and literature
- Analysis
 - Using complex system approach, multi-level, multi-phase

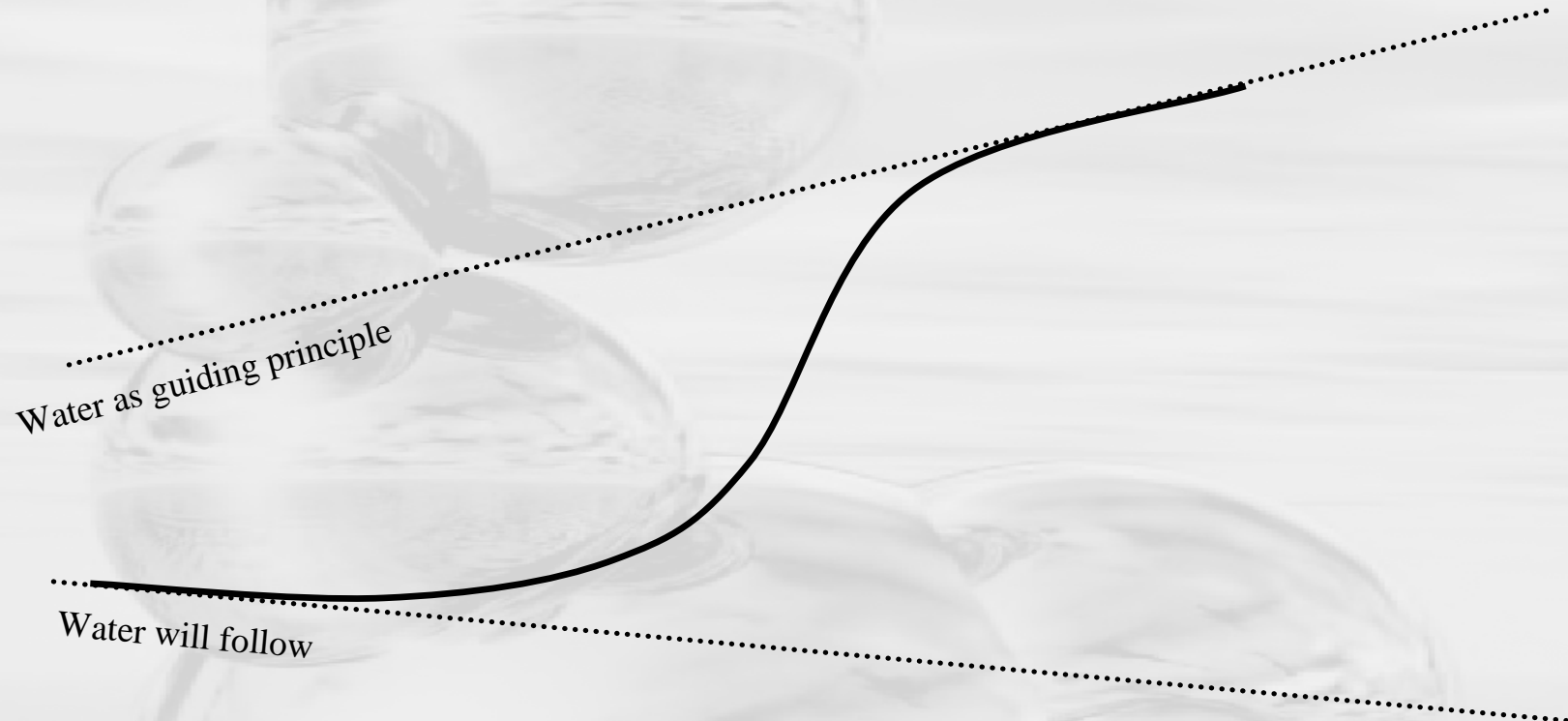
The Water Management *system*



What changed?

- Problem perception
 - from singular to interrelated problems
- Management perspective
 - from technological to spatial solutions
- Competences
 - From disciplinary to interdisciplinary
- Staff
 - engineers + biologists, jurists, public managers etc.
- Institutional organization
 - from top-down to participatory

The water transition (2)



Water as guiding principle

Water will follow

Why shift? *1970-1990*

- Trends at the macro-level
 - Environmental awareness
- Ecological damage
 - Delta Works
- Innovations at the micro-level
 - Delta Dienst: *Water system* approach (1985)
 - Ooievaar: Nature in the river floodplains (1987)

*Emergence of an ecological oriented
water management approach*

Why shift? *1990...*

- Floods (1993, 1995)
 - Changing perception of flood risk
- Trends at macro-level
 - Climate change
- Innovations at the micro-level
 - Living Rivers (WWF, 1992)
 - Tielrooy Committee (1999)

*Emergence of spatial approach in
water management*

How did it change?

- Co-evolution:
 - Integration water management & nature policy & spatial planning policy
 - Decreasing Agricultural sector
 - Re-orientation on water policies
 - Re-organization within Rijkswaterstaat
 - Merger of regional water management boards
 - Decentralization trend

Self-organization:

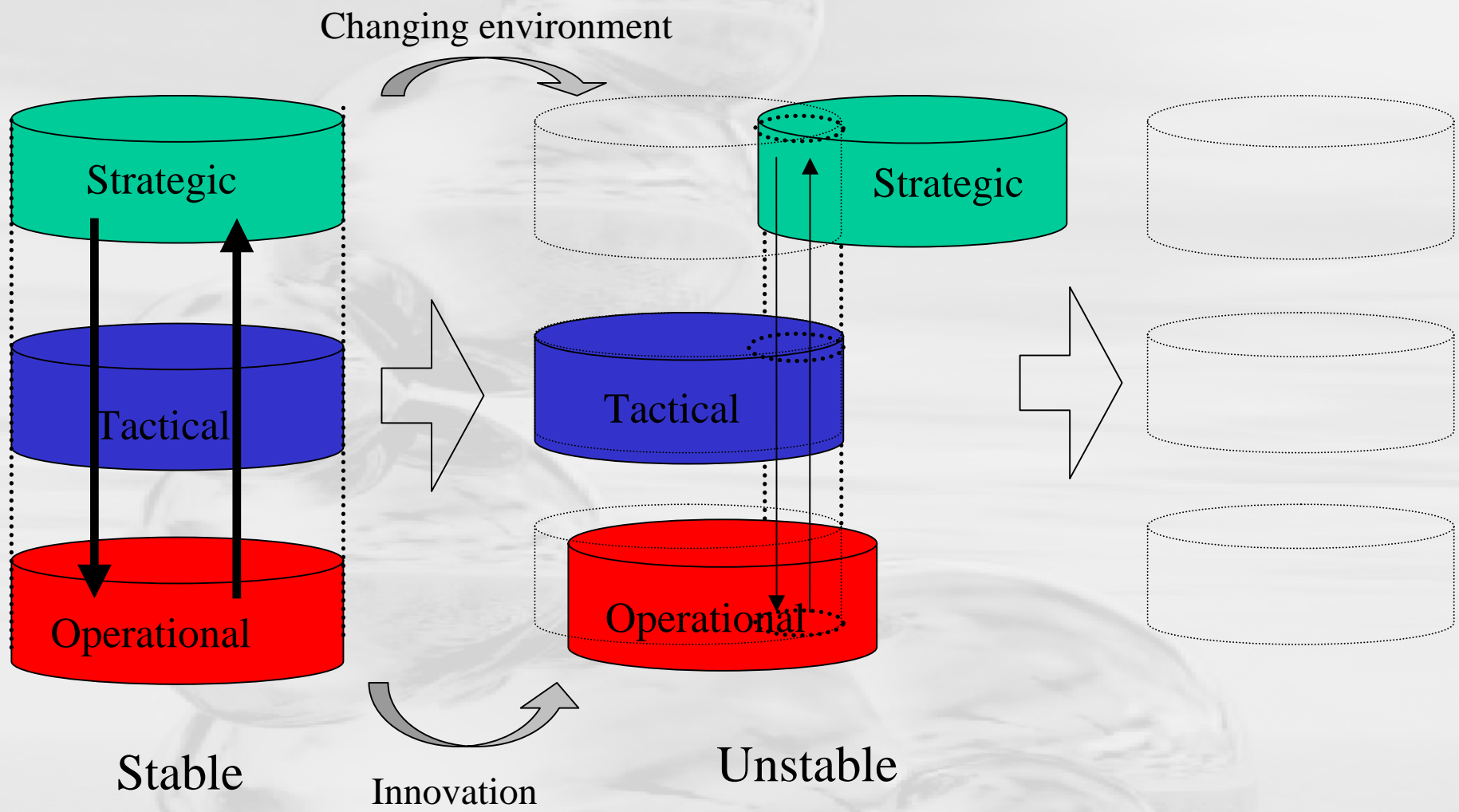
- Re-balancing water institutions (actors)

Current Status?

- Strategic level
 - Consensus about starting points new attractor
 - Vague about end points: future images
- Tactical level
 - Debate integration regional water management boards & provincial government
- Operational level
 - Difficult implementing at the micro-level

Water transition is in the take-off phase

Regime change



Water transition management

- Aiming at modulation between strategic, tactical and operational level
- Water Transition Arena
 - Creating future image of water system
 - Innovators
 - Integrated systems analysis
 - Guides action on tactical and operational level

Conclusions

- Water management in transition
 - from ‘water will follow’-attractor to ‘water as a guiding principle’-attractor
- Transition in take-off
- Gaps between strategic, tactical, operational
- Transition Arena
 - Develop future images of water system
 - Guiding for further strategies