



Integrated Water Quality Management

– Development of a Social-Ecological Approach –

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Overview

Challenge of Sustainable Resource Management

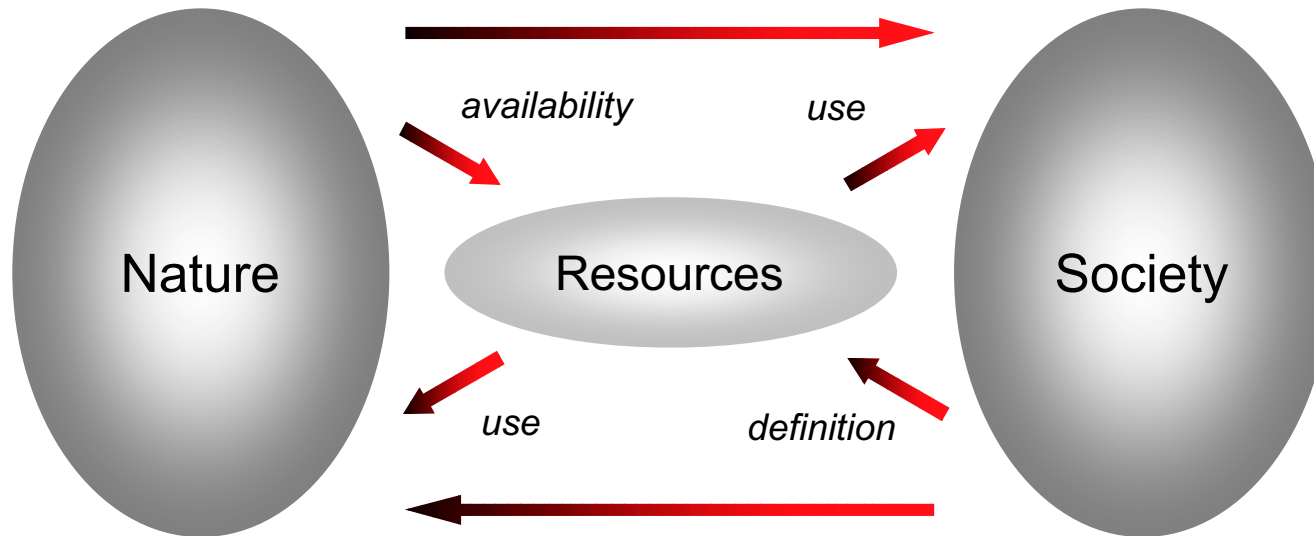
Requirements for Problem Solving

Social-Ecological Approach

Focus: Water Quality

Methodology & Modelling Concept

Summary



Challenge of sustainable resource management:

- Find **balance** between a multitude of demands and conflicting interests

Problem:

- Different functionalities of resources with close **entanglement** of social and natural processes
- **Competition** of humans and ecosystems concerning natural resources

Example: Water

- Economical and social functionality of water and its relevance for the conservation of the ecosystem

➤ Environmental problems are also social problems!

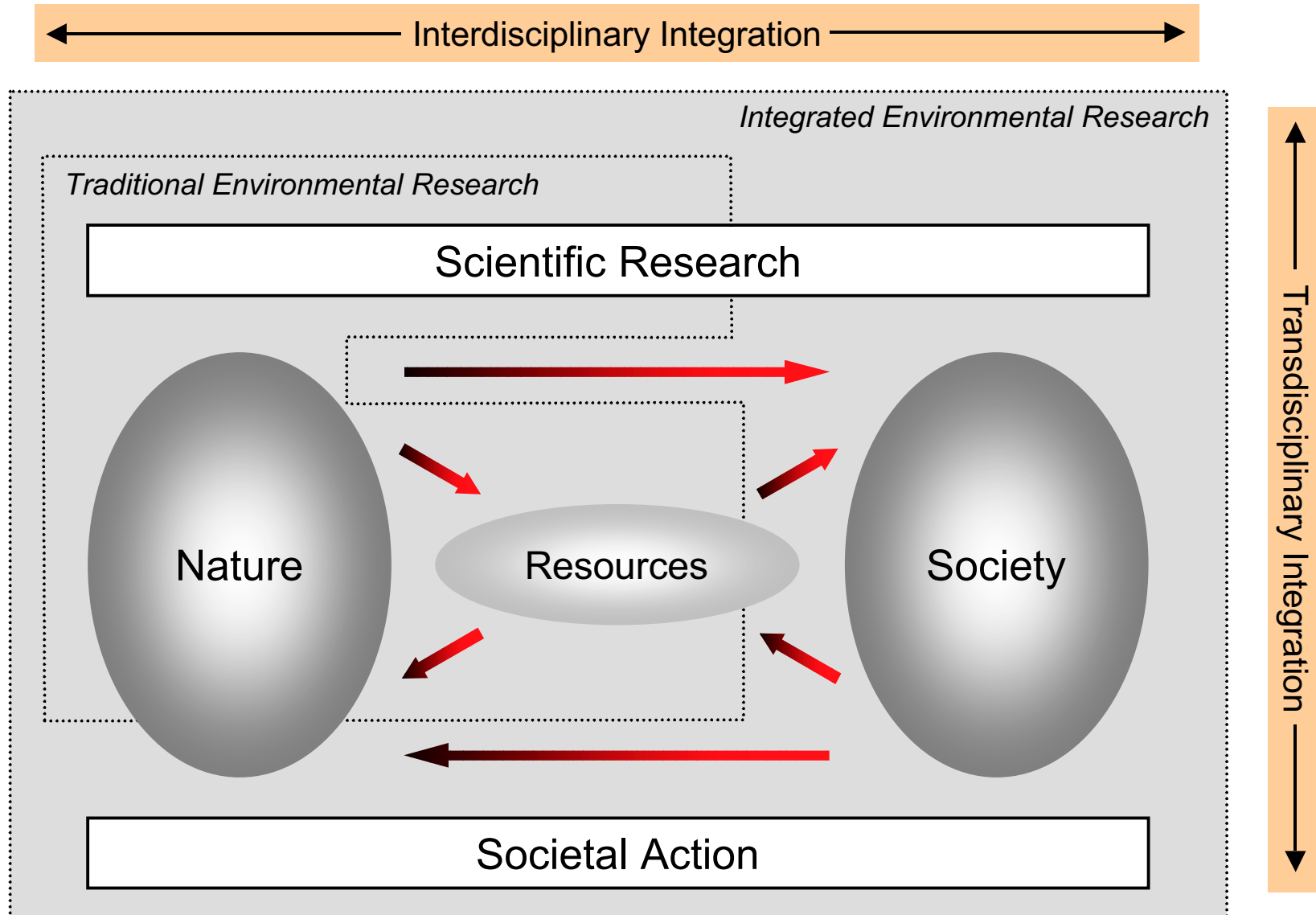


Research process with two dimensions of integration:

- Need for profound understanding of the relevant processes
- Processes are part of a complex socio-ecological structure of causes and effects
- Necessity of disciplinary integrated characterisation and analysis of that complex structure

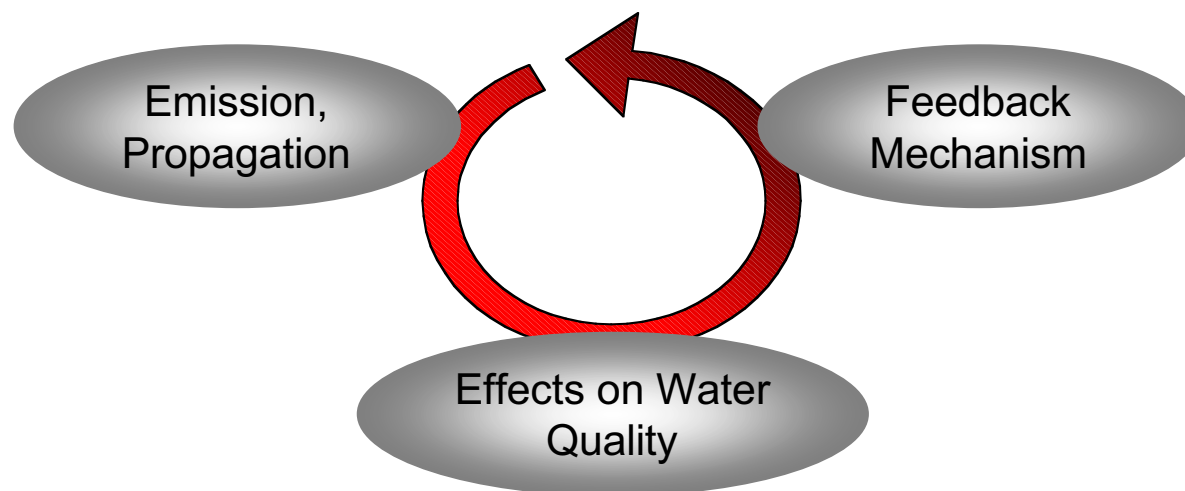
- Importance of translation of scientific results into social action
- Need for stakeholder participation in transdisciplinary research process

- **Interdisciplinary and transdisciplinary integration**

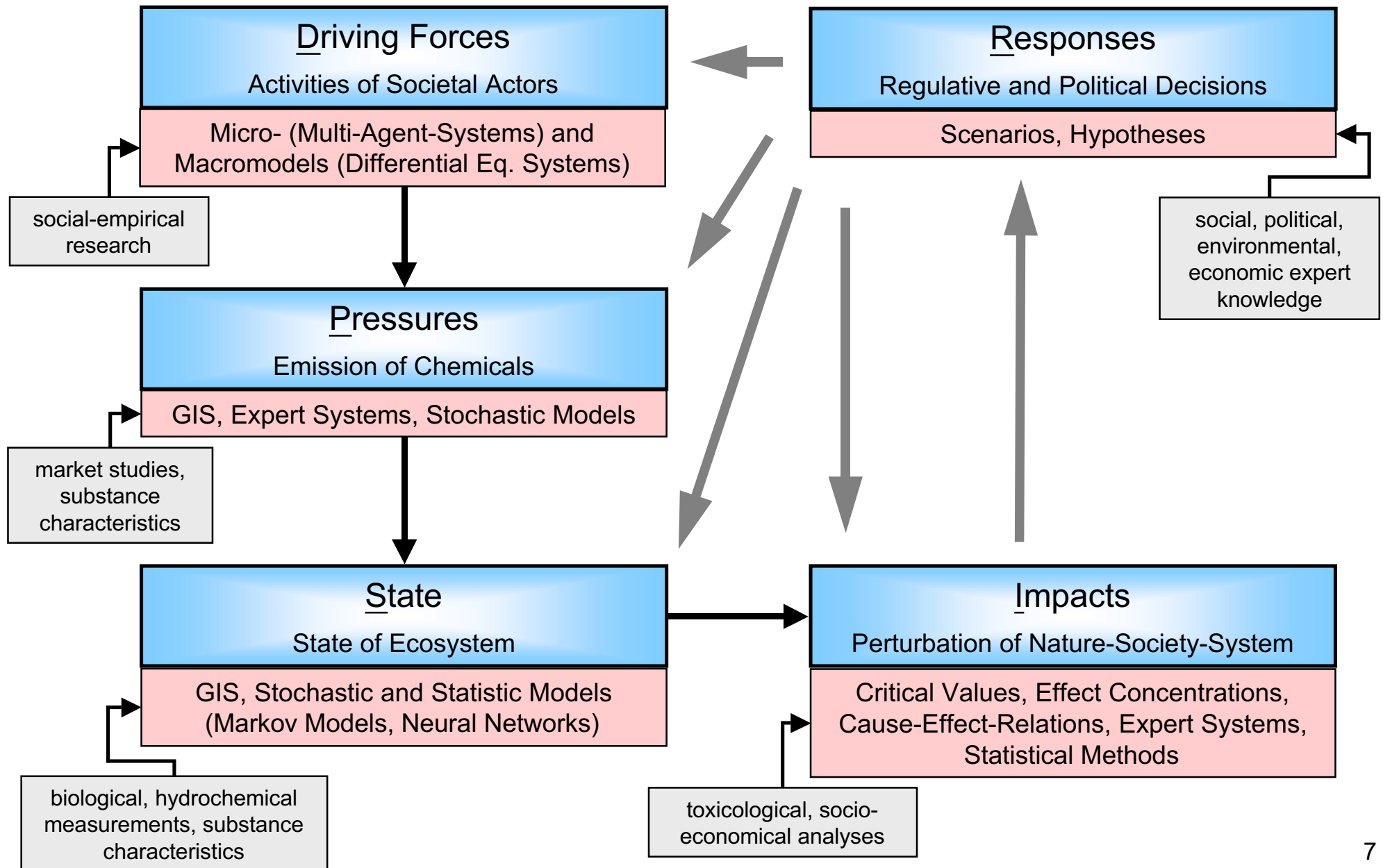




- Technical and economic progress leads to emission of a wide spectrum of chemicals
- In parallel: well-understood characteristics of substances and incomplete knowledge
- Emerging problem of “**new pollutants**” with properties like persistence and very-low-dose-effects
- Strong uncertainty about anthropogenic endangerment of surface waters and groundwater bodies
- Cost-benefit calculations disregards non-monetary effects on society
- Need for an **integrated research perspective** concerning the
 - emergence of risk potentials
 - identification and analysis of propagation and distribution characteristics
 - interdependency of natural and social dynamics



Methodology & Modelling Concept



Water quality management oriented at the sustainability principle

- requires **not only** hydrological and economical methods
- **but** also the establishment of new adapted procedures of risk evaluation
 - encompassing different aspects of societal action,
 - including the management of uncertainty and ignorance and
 - addressing in particular the challenges of the problem area of “new pollutants”.

This talk presented a

- concept for the development of an **integrated, flexible and adaptive water quality management**.
 - **Integration** of different disciplinary and policy-oriented points of view
 - **Flexibility** to meet the needs of the considerable dynamics of the problem field
 - **Adaptability** to varying demands and increasing knowledge

Take-Home-Message:

Society goes beyond economical considerations.

„So wird das Leitbild ‚Nachhaltigkeit‘ im Wassersektor nur erreichbar sein, wenn die Wasserforschung der integralen Funktion des Wassers in den Ökosystemen wie auch in der menschlichen Gesellschaft Rechnung trägt.“

aus dem Abschnitt „Prinzipien der Wasserforschung“
DFG-Denkschrift, Seite 10



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