



Integrated River Basin Management: From science to implementation

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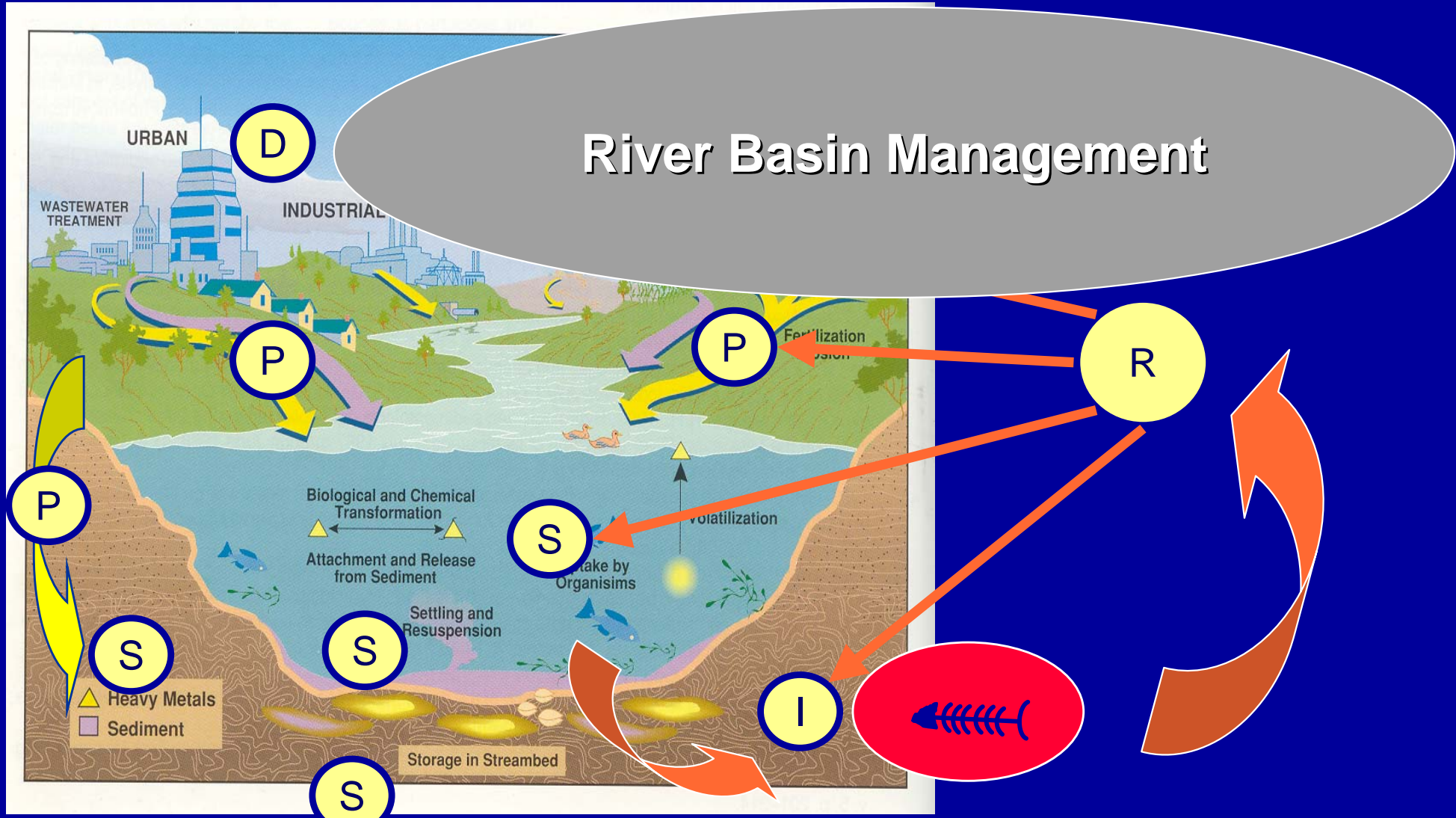


Outline of my talk

- River Basin Management (objectives and challenges)
- Risk > Risk Assessment > Risk Management
- Towards Risk Based Management > Resilience
- Joint Fact Finding
- New opportunities



Improve and apply **system understanding**



River Basin Management Objectives

According to the Water Framework Directive (WFD):

- Protection of **ALL** waters
- Good ecological and good chemical status by 2015
- Degradation of water bodies not allowed
- Stepwise reduction/elimination of the emission of hazardous substances



Generic challenges in Europe

EU river basin managers face several challenging management issues when trying to achieve the WFD objectives.

In general they have to manage:

- Hydro-morphological changes
- Quantity (water/sediment excess and shortage)
- Quality (diffuse and point source contamination)



Their main uncertainties:

- Combined impact of above issues?
- Changes in socio-economic driving forces and resulting pressures?
- Effects of climate change?



River basin project: AquaTerra objective

Objective

- Provide scientific basis for **improved river basin management**

AquaTerra, through a multidisciplinary approach, tries to improve our knowledge on the fate and behaviour of (selected) contaminants in (selected) European River Basins

Boundary conditions

- applicable to European contexts
- facing modifications / changes due to climate change, land use and pollution

Requires

- identification of relevant processes & quantification of associated parameters
- development of numerical models of groundwater-soil-sediment-river system
- to identify adverse trends in soil functioning, water quantity and quality



Hypothesis

Basis for improved river-basin management is the better understanding of:

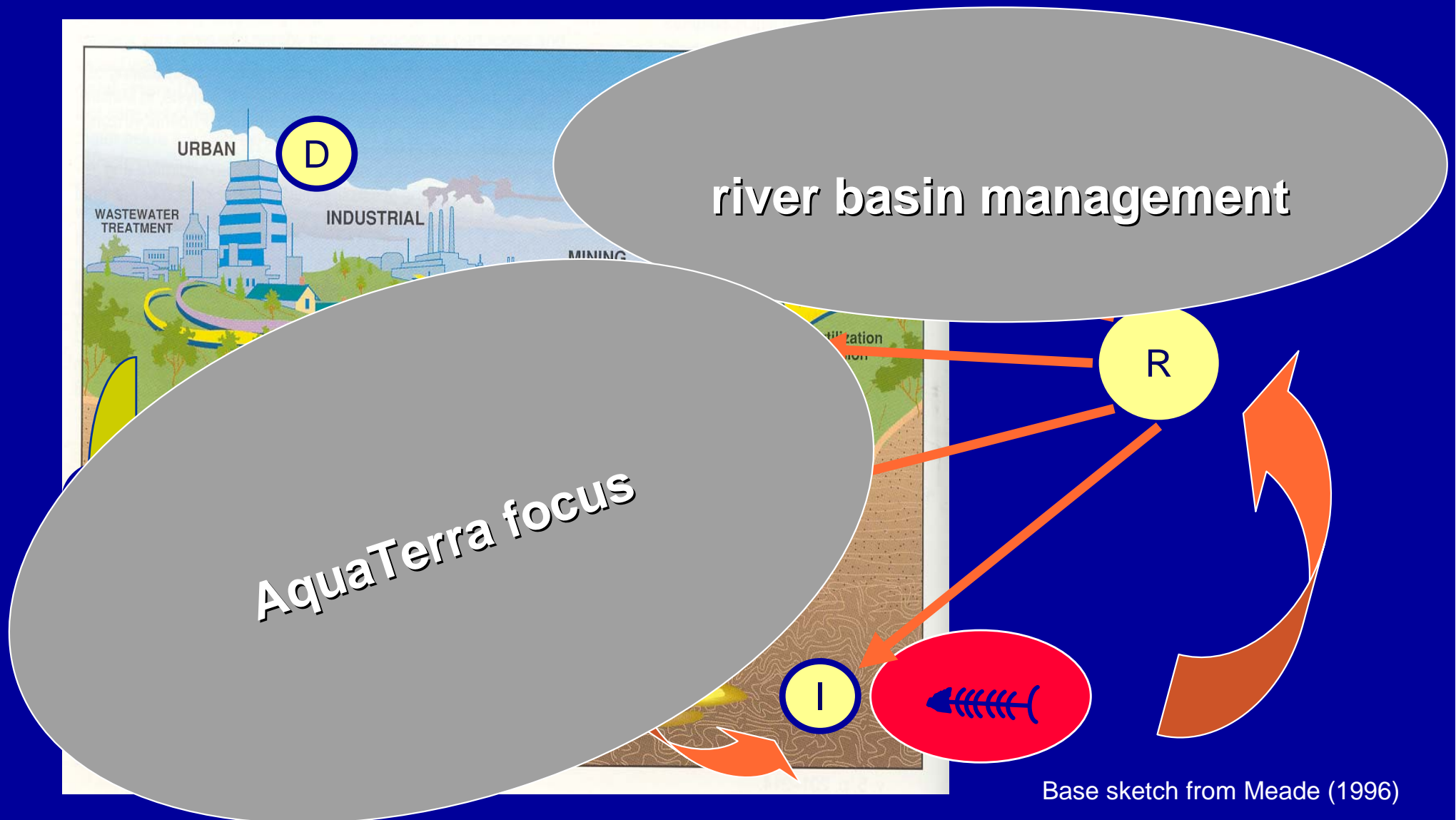
- The functioning of the **biophysical** soil/sediment/water-**system**
- The functioning of the **societal system** (policy, management, public)
- And especially of the **interaction** between both layers (especially relationship between 'measures' and 'effectiveness' > implementation)



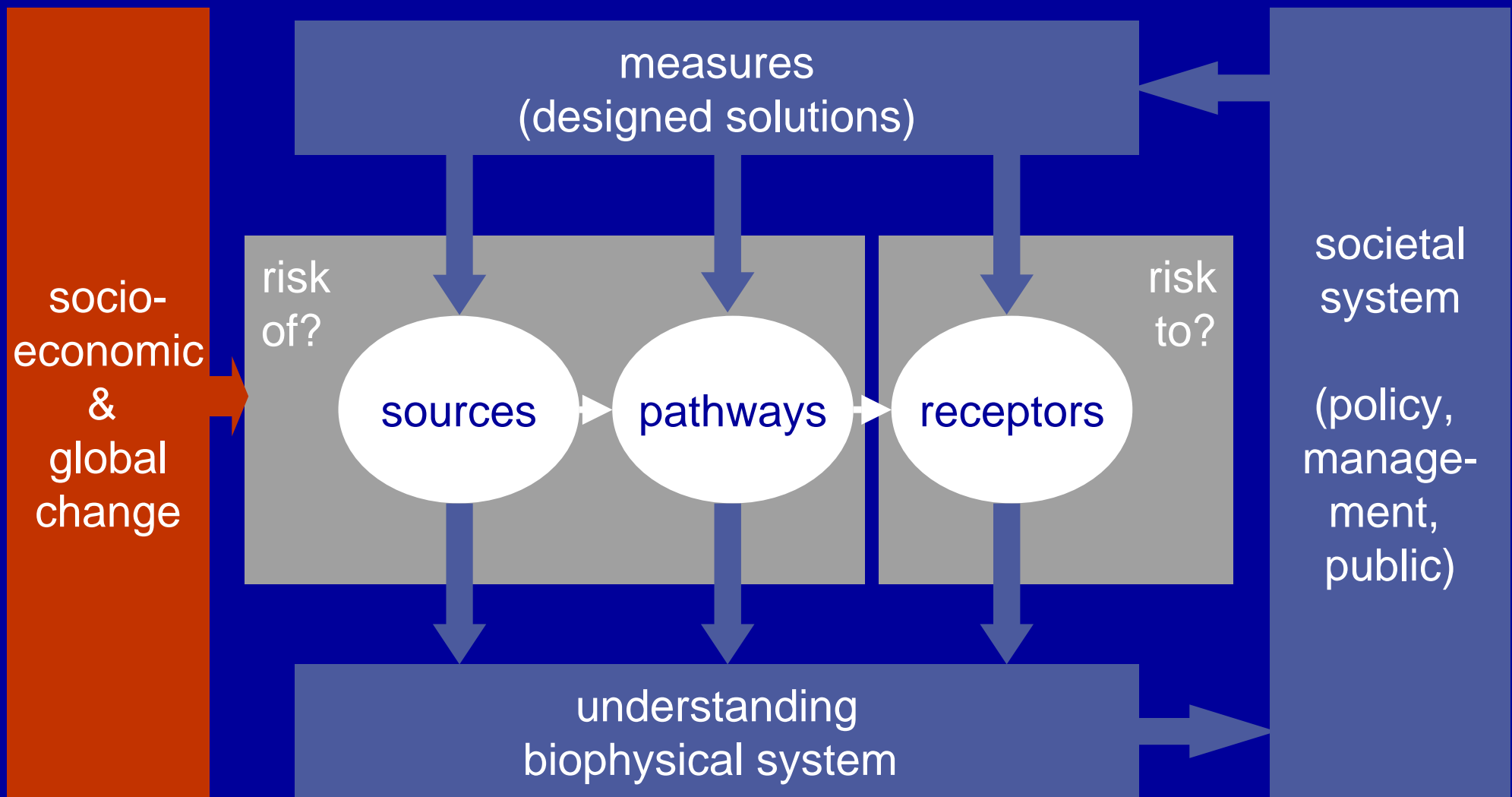
science-policy/management interface



DPSIR as conceptual framework for understanding of the system



Towards a risk-based management framework ...



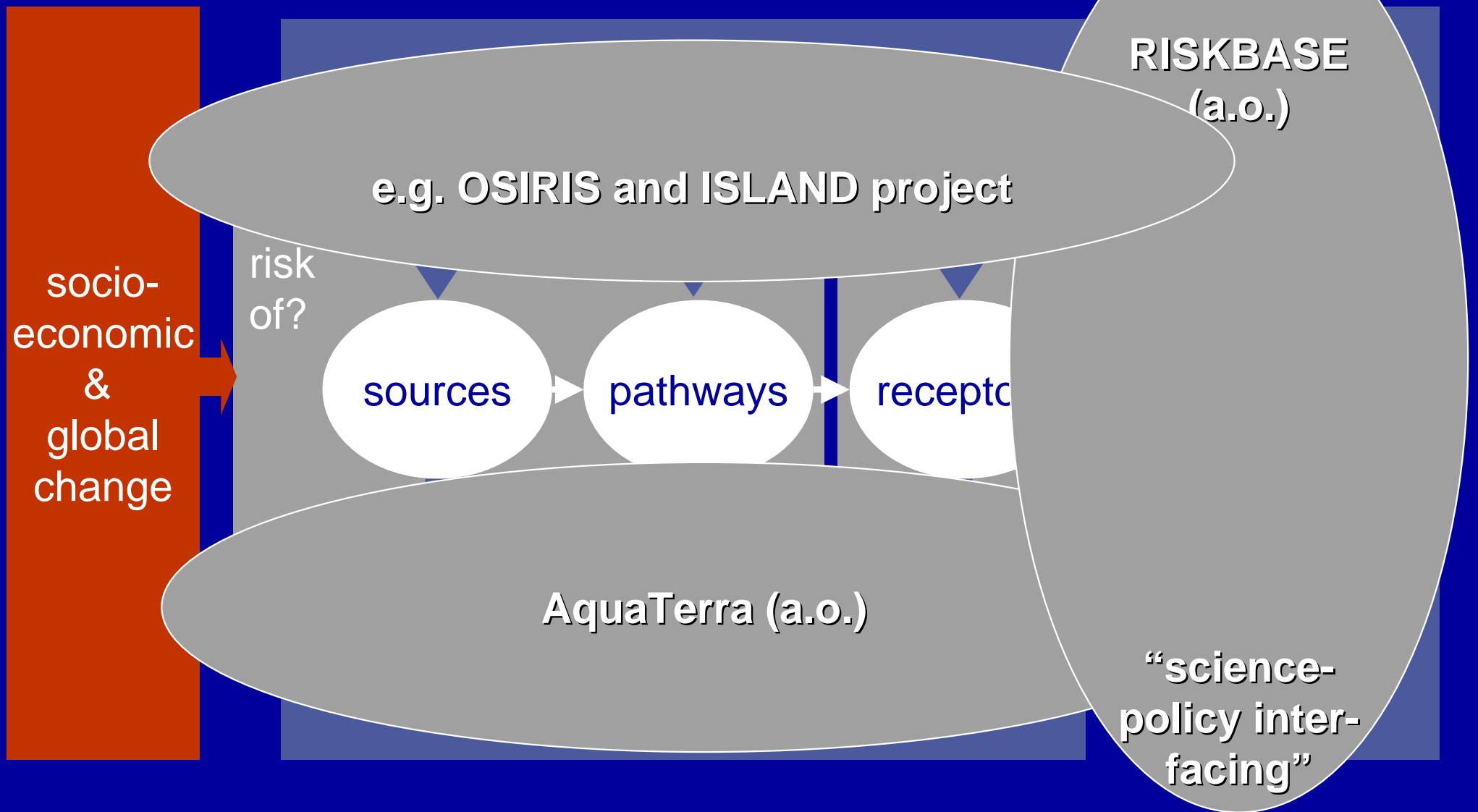
RISKBASE DRAFT CONCEPT for risk-based management (RISKBASE, 2007)



Final Seminar ISLAND, 14-16 May, Ha Noi, Viet Nam



Where are the projects ...



DRAFT CONCEPT for risk-based management (RISKBASE, 2007)



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The AquaTerra story ...

“AquaTerra research results provide arguments for risk-based management of contaminants, building on the natural resilience of river basins ...

... AquaTerra provides more insight in the potency of resilience as a tool (measure) to manage the biophysical system” *

* Jansen S, Joziase J, Rijnaarts H & Brils J. (in prep, H₂O): AquaTerra research results for Dutch water management (in Dutch)



Natural resilience

- River systems have a certain, natural potency to attenuate (**reduce risk**) negative impacts of contaminants (**Natural Attenuation**)
- This provides very interesting options to management, as:
 - nature can work for you
 - it has the least impact on system integrity
 - it is very cost-effective
- However, prerequisites are:
 - patience (natural processes are often slow)
 - **understanding/acceptance** by policy, management and public

AquaTerra provides a major contribution to the “science” part,
but how to interface with the “policy” part?



Joint Fact Finding

More effective use of scientific information in policy making can help avoid or mitigate the direct consequences of human-induced stressors on the environment and enable better management of ecosystems and natural resources.



Why is science often ignored in important societal decisions even as the call for decisions based on sound science escalates?



Conflict
Uncertainty
Communication



Collaborative Processes

- Reduce conflict
- Explain uncertainty
- Inclusive (holistic)
- Transparent and open



Collaborative Processes

- Shared learning
- Trust
- Creative problem solving
- Shared ownership



“...in a world put at risk by the unintended consequences of scientific progress, **participatory procedures** involving scientists, stakeholders, advocates, active citizens, and users of knowledge **are critically needed.**”

Kates et al, 2001



Decisions are based on **Values**

Science provides a **Context**

Herman Karl, U.S. Geological Survey, Massachusetts Institute of Technology, 2006



“...science cannot operate independent of value judgments in making public decisions and resolving disputes over [natural] resources.”

McKinney and Harmon, 2004



Information approach ISLAND

- How can information be tailored to meet the needs of communities
- How can we assist communities to make their own risk and vulnerability assessment
- How can we give communities access to reliable and readily understandable information from relevant sources
- How can we ensure local uptake of information through appropriate ICT tools

Improving the communication of information on flooding and other risks to local communities in South-East Asia; Gilles Morel, ISTED; Sebastien Despres, IMRC, 2007



Linking Local Knowledge to Joint Fact Finding

- Inform scope of the investigation
- Knowledge that adds information to existing expert analysis
- Knowledge of unique aspects of systems and locations
- Join local and scientific forms of analysis



A Simple Hypothesis

The more you involve people affected by a policy decision in the framing, design, and generation of the scientific inquiry, the more likely they are to understand, value and use the scientific information.



Results ISLAND

- Scientific input: hydrological and hydraulical
- Field visit results:
 - Shift from flood control management to need for use for community activities (weather forecast, economical data, ...)
- Improvement:
 - Speed of information between national / regional / local level
 - System knowledge
 - Quality of the information
 - Extend type of information (pollution, morphological, market, ...)



Opportunities to improve the system

- Partners for Water (Netherlands)
 - Feasibility study (154 kEuro)
 - 80% of costs reimbursable
- Possible subjects:
 - Build further on 'early' warning system
 - Capacity building for elaboration and implementation of IWRM
 - Stakeholder participation
- Groundwater extraction:
 - Depletion
 - Saltwater intrusion
 - Soil subsidence
- Prediction of floods and drought period
- Water, sediment and soil pollution
- Prediction of crop to harvest (RS)
- Monitoring programme
- Combining efforts to underpin sustainability ICT efforts



Conditions

- Millennium goals water and sanitation
- A Asian recipient, existing organisation (local – regional –national level)
- Input form local partner and connection with regional and national level ('bottom up' approach)
- Partners from the Netherlands (e.g. Province of Brabant, equipment producer, service provider, R&D organisation) that export the water management knowledge
- Real possibility of follow up funding (Asian Development Bank, ORET >> mEuro (NL), French programmes...)



Thank you !



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