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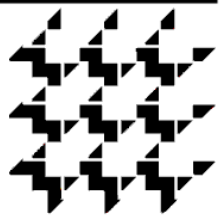

MPE 2013+ Workshop on Sustainable Human Environments

Participatory modelling for water planning and risk management at the urban fringe

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HC Coombs Policy Forum

23rd April 2014
Rutgers University

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Presentation Plan

- Introduction: water planning and risk management + participatory modelling theory
- Method: intervention research
- Australian and Bulgarian case study examples
- Participatory modelling process outcomes and key insights
- Lessons: discussion, conclusions and perspectives

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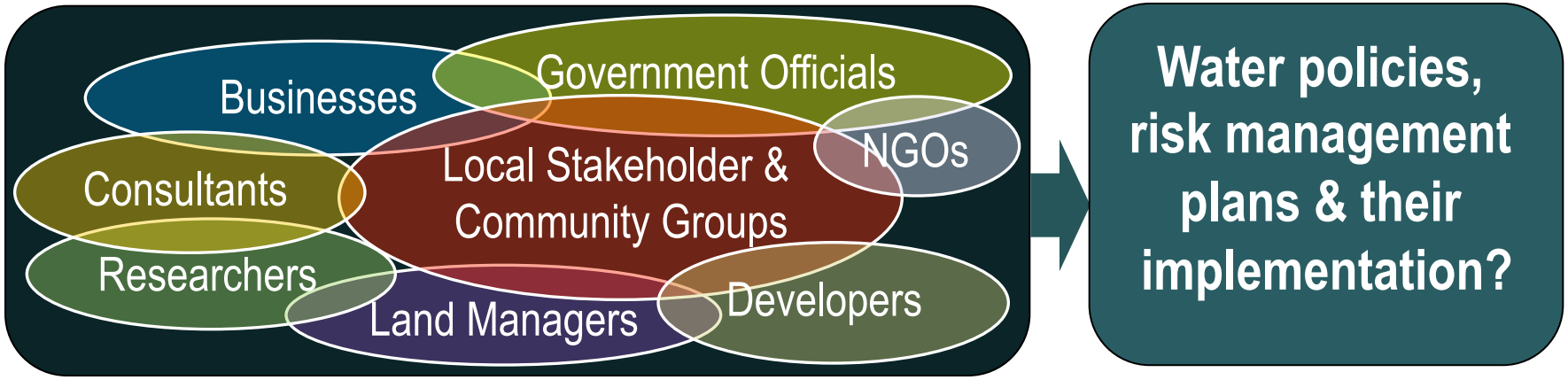
Water planning and risk management at the urban fringe

Why seek to involve stakeholders in water planning and risk management?

- High levels of conflict, uncertainty, complexity
- Legitimacy of expert models and risk assessments questioned
- Ecological degradation vs. other social and economic interests
- Power and resources for decision-making and action increasingly dispersed



→Challenging negotiations over **risks** and **management responses** based on differing stakeholder values, beliefs, relations & practices

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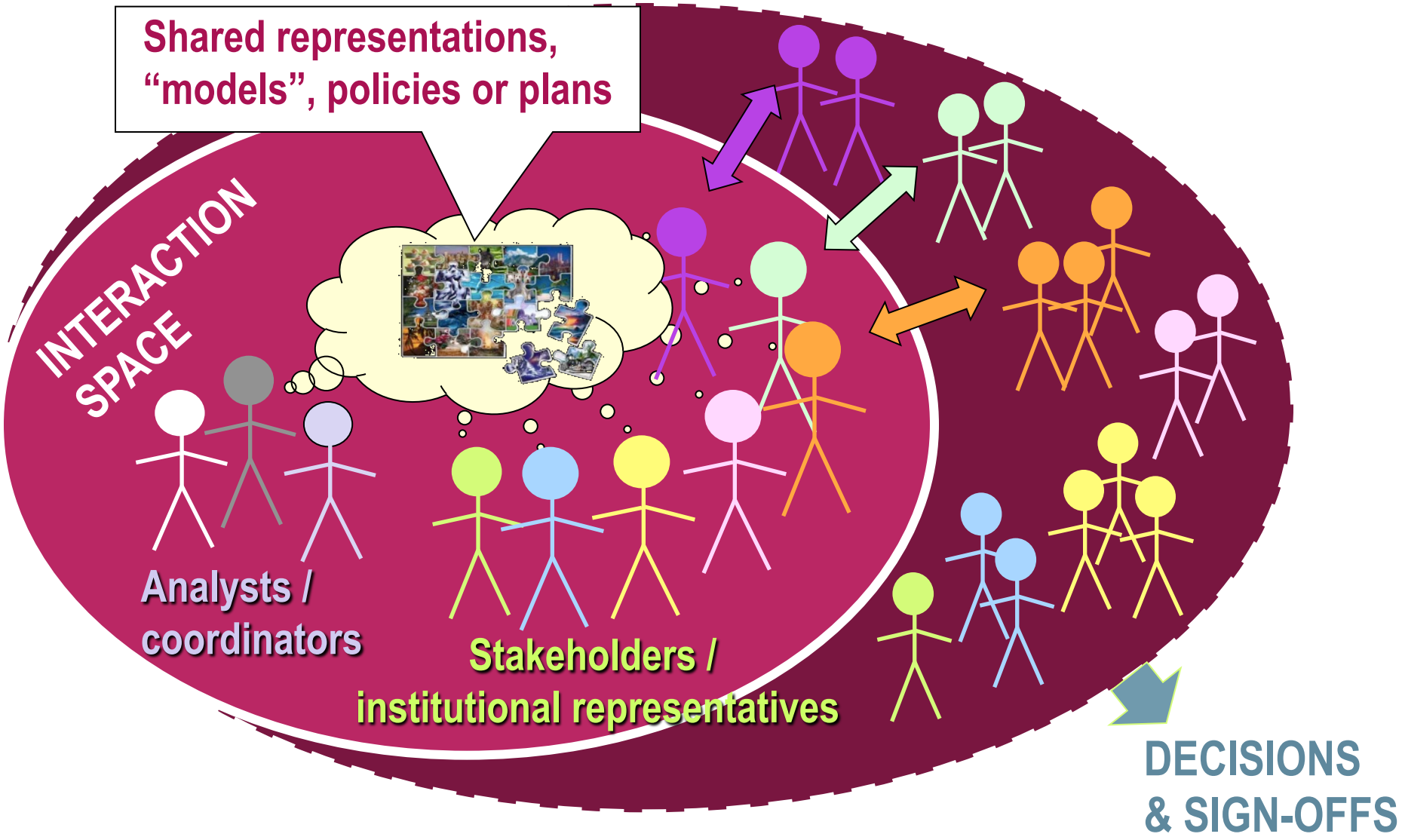
Understanding participatory modelling



Who to engage in participatory modelling processes?

- **Need for 'multi-level' participatory modelling processes for sustainable water management + early and in-depth engagement with decision-makers**

Who to engage in participatory modelling processes

Who will champion the implementation?

Who specifically will make the decisions?

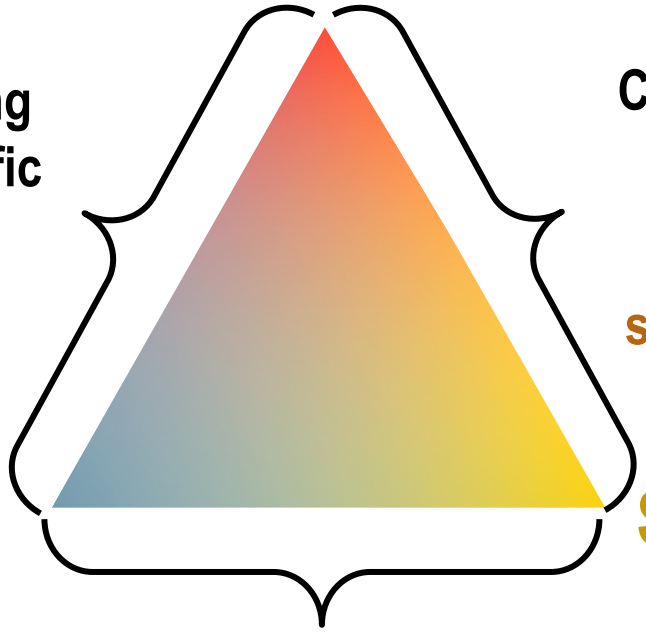
Politics & Management

Efficient decision making based on sound scientific knowledge

– possibility for public backlash

Construction of socially acceptable decisions

– possible lack of scientific bases & other associated problems



Research & experts

Stakeholders & Public

Who has the analytical skills?

Who has the required knowledge?

co-sharing of knowledge and construction of scientifically valid and socially acceptable solutions

– possible lack of power required for implementation

Adapted from Thomas (2004)

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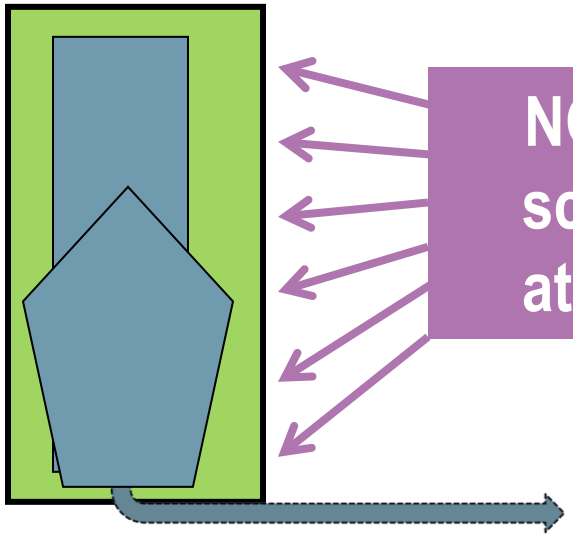
Method: development of participatory modelling approaches to water planning

- **Development & analysis of approaches through intervention research and case study comparison** (cf. Hatchuel, David, Midgley)
  - **Using a decision-aiding process model and evaluation protocol** (cf.Tsoukiàs, 2005; Daniell and Ferrand, 2006)
  - **Pilot development and testing in Montpellier, France**

Method: development of participatory modelling approaches to water planning

- **Development & analysis of approaches through intervention research and case study comparison** (cf. Hatchuel, David, Midgley)
  - **Using a decision-aiding process model and evaluation protocol** (cf.Tsoukiàs, 2005; Daniell and Ferrand, 2006)
  - **Pilot development and testing in Montpellier, France**
  - **Australian and Bulgarian regional examples**
- **Focus on multi-level processes used for planning**
  - **Politicians and government officials to local residents**



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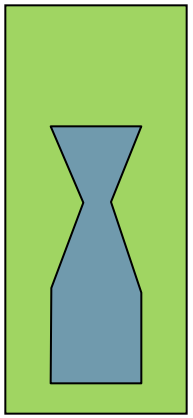
Participatory modelling approaches to regional peri-urban water planning

- **Management-driven process**
  - **AUSTRALIA: Lower Hawkesbury**
- **Research-driven process**
  - **BULGARIA: Sofia Region**
- **Multiple issues**
  - **Perception of climate change impacts**
  - **High population growth / urbanisation**
  - **Water conflicts: quality and quantity**
  - **Economic / environmental viability of industries**

Example 1: Australian management-driven process

Creation of a "risk response" plan for estuary management

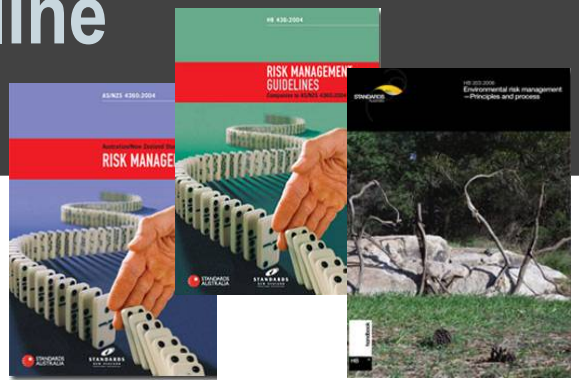
Lower Hawkesbury River



- National
- State
- Regional
- Community
- Individuals

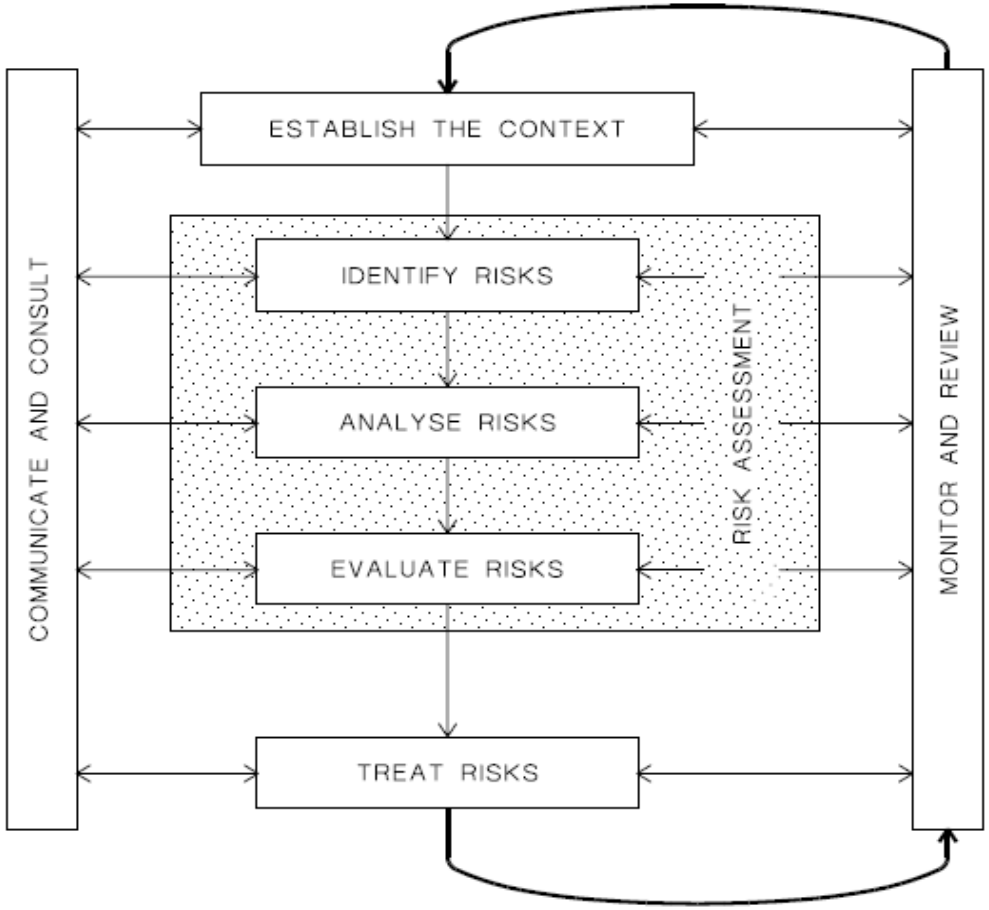
Use of Risk Management Standard AS/NZS 4360:2004

Australian Process Outline (AS/NZS 4360:2004)



Lower Hawkesbury Estuary Management Plan (LHEMP) Process

- Workshop 1
- Document Review
  - Estuarine Processes
  - Management / Legislation
- Estuary Report
- Workshop 2 (agency only)
- Workshop 3
- Written Plan
- Implementation



LHEMP Workshop 1: Establishing the context

Individual values and issues cards

Issues/values matrix

Card classification

Spatial mapping

Collective discussion on estuary visions & values

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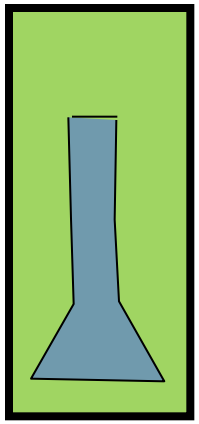
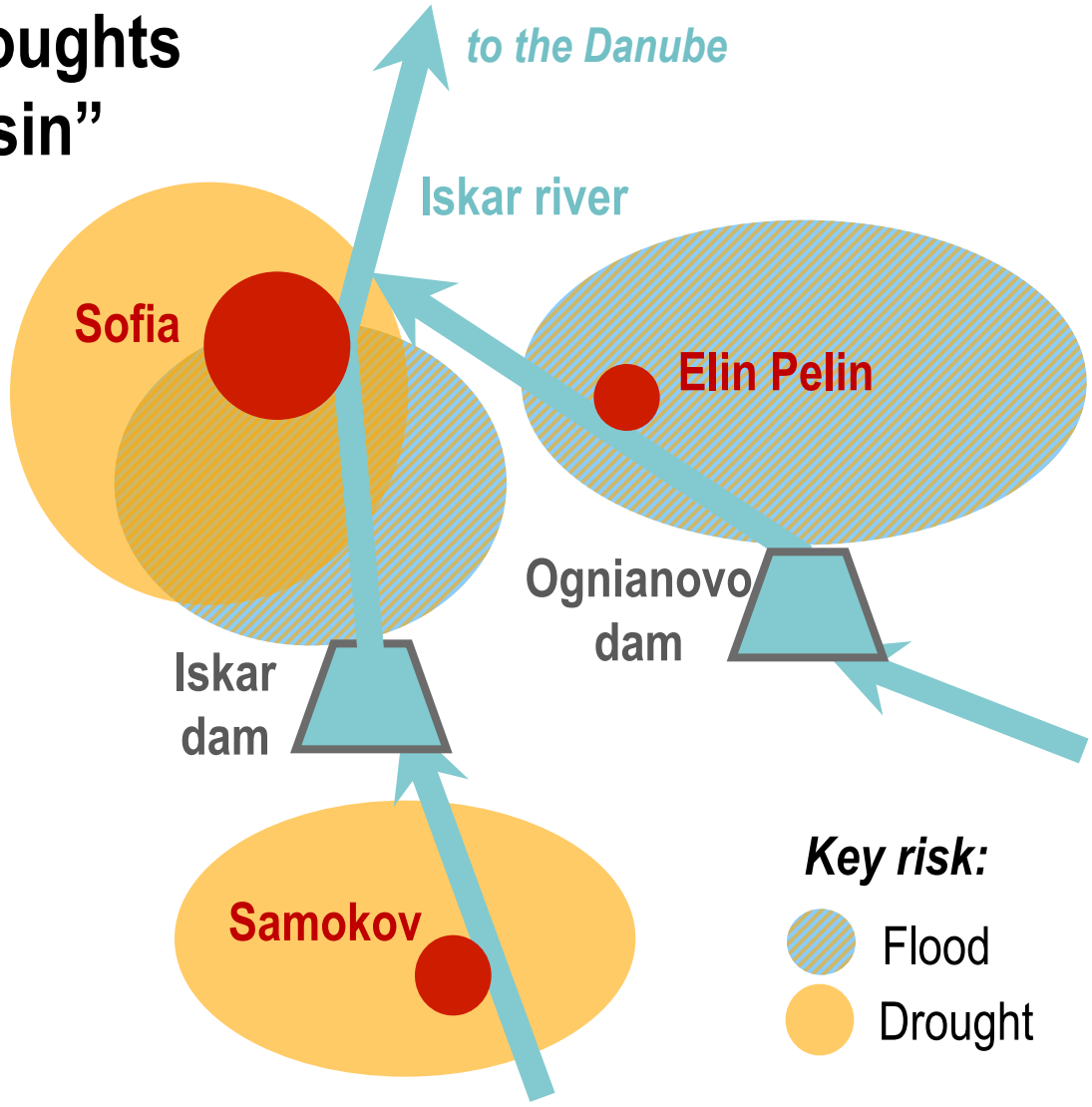
LHEMP Workshops 2 & 3: Risk Assessment and Treatment

Example 2: Bulgarian research-driven process

"Living with floods and droughts in the Upper Iskar Basin"



- Transnational
- National
- Regional
- Community
- Individuals

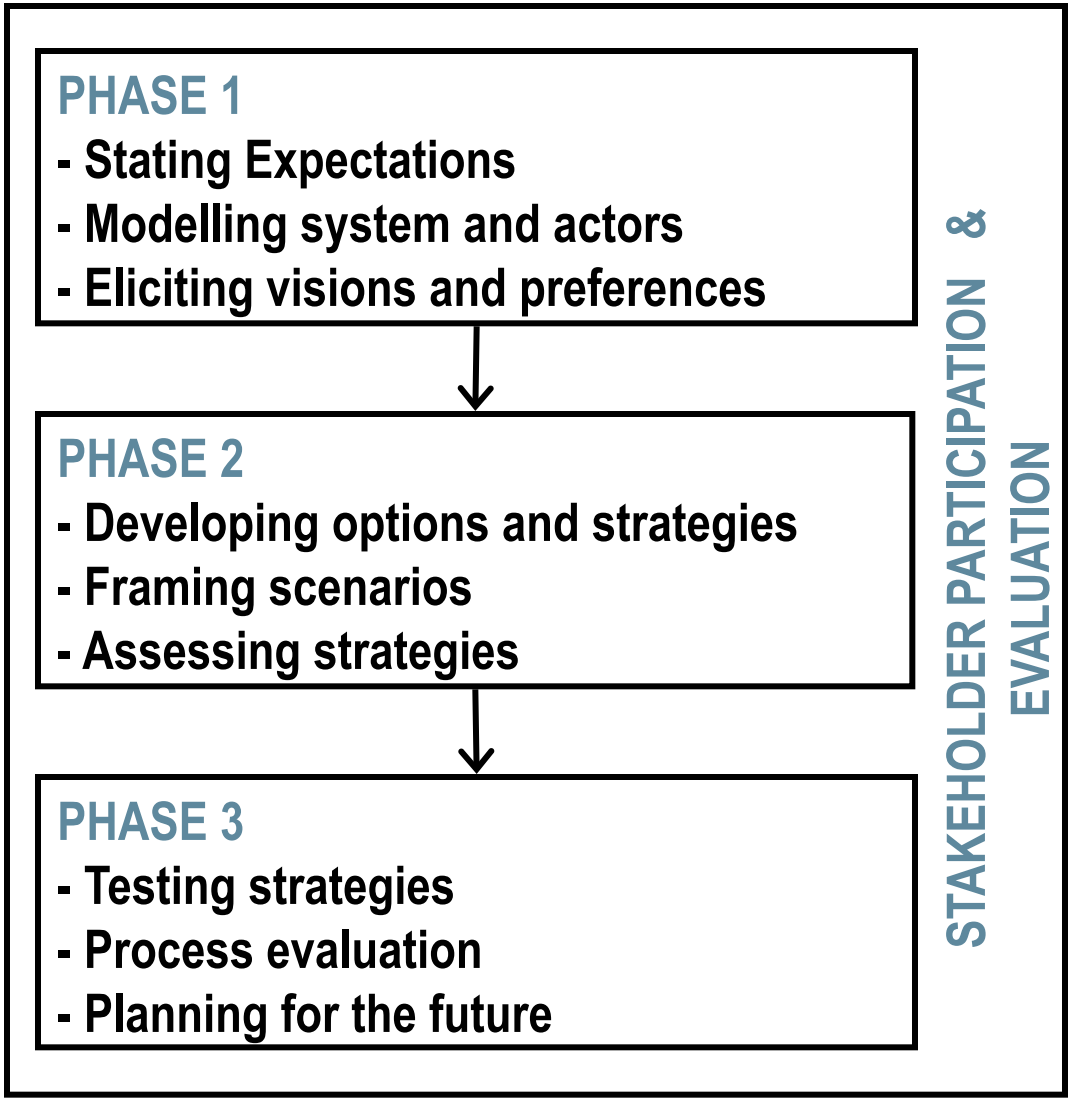


Bulgarian Process Outline (1 year program)

- Individual interviews
- Workshops 1,2&3

- Individual and group interviews
- Workshops 4a

- Workshops 4b&5



(Ferrand, Hare and Rougier 2006)

Iskar phase 1 & 2 (individual groups): Situation models, visions and strategy creation

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Expectations

Visions and preferences

Strategy creation and options evaluation

Causal mapping

Needs						Options implemented	ПКВ	Type	Impacts on:							
Time, duration	Infrastructures	Citizens	Institutions	Other resources	Cost				Households	Industry	Agriculture	Politics	Nature	Infrastructures	Droughts	Floods
		1	1			Държавно законодателство	П	Управление					+	+	+	
			1			Контрол на оттока	П	Управление & Инфрастр					+	+	+	
						Разработване на план за о	П	Управление					+	+	+	
						Съхранение на вода	П	Управление & Инфрастр					+	+	+	
						Договаряне на намаление	П	Управление					+	+	+	
						Съхранение и възстановяв	П	Инфраструктура					+	+	+	

Iskar Phase 3: vertical integration, fusion & analysis of strategies, action planning

Strategy fusion

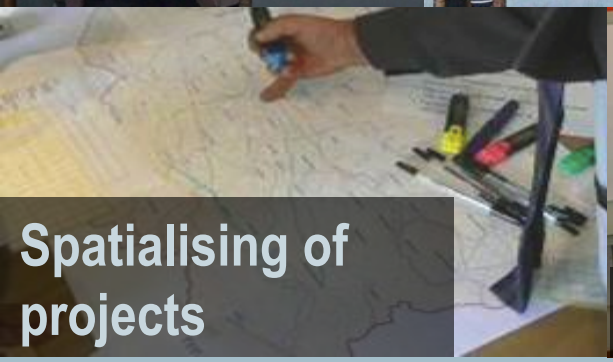
Robustness analysis of new strategies

Vertical integration

Action plan

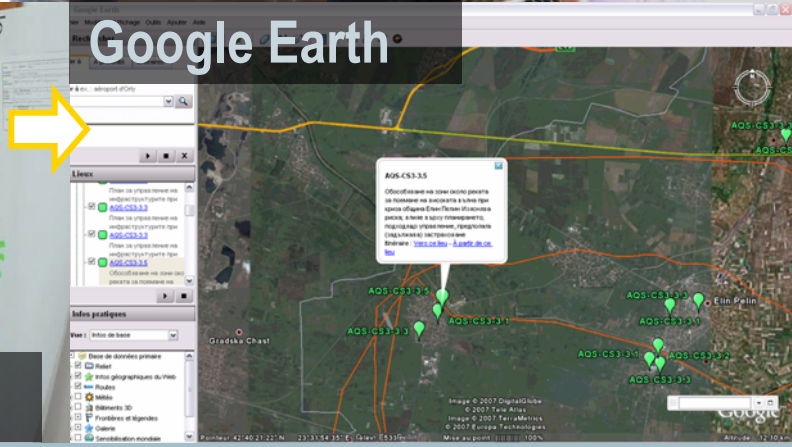
Evaluation jury

Project construction



Spatialising of projects

Voting on projects



Google Earth

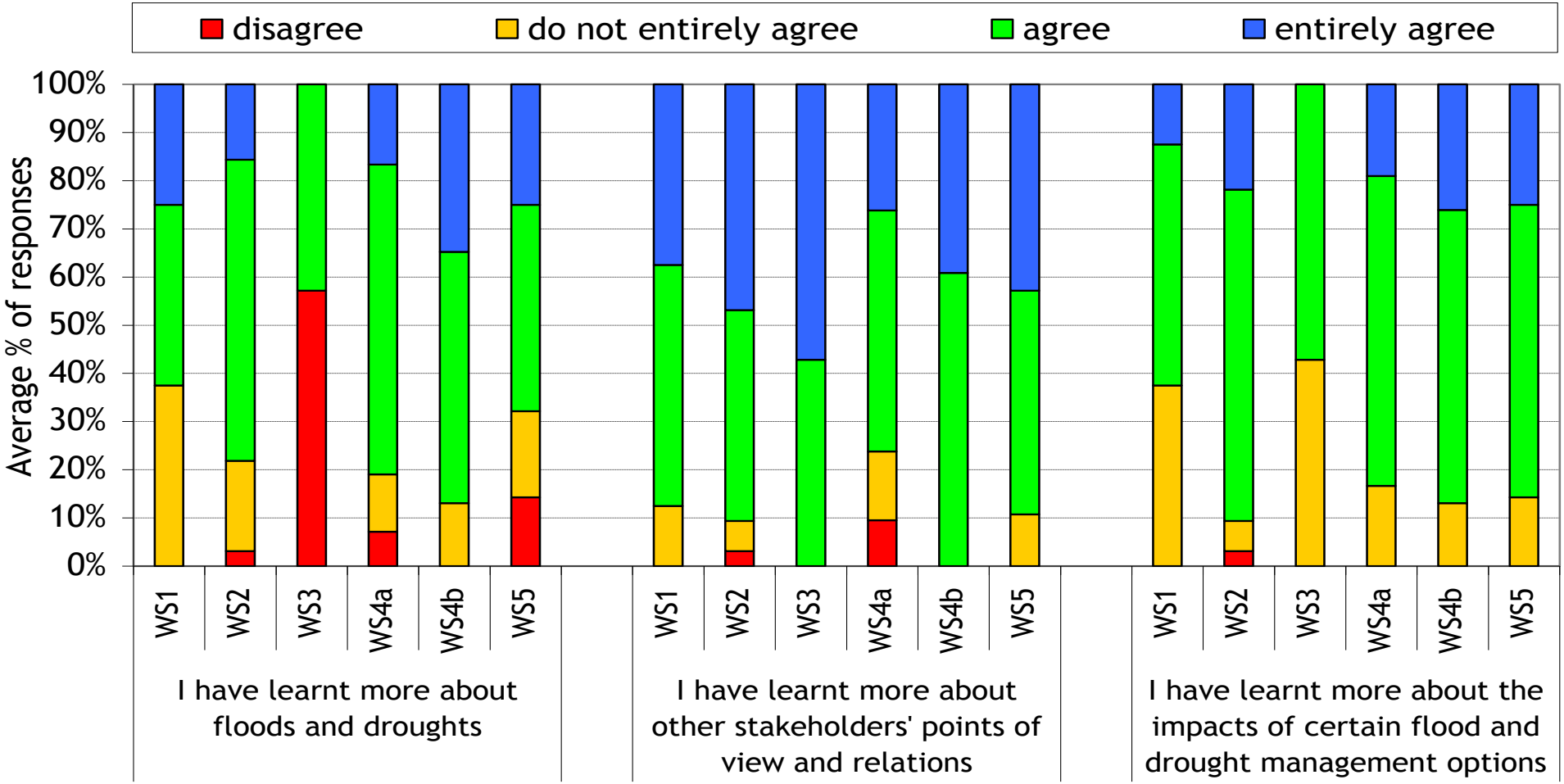
Process evaluation framework

- Aimed to understand three aspects of the decision-aiding process
  - Organisational decision-making processes
  - Participatory stakeholder processes for planning/policy-making
  - Overall intervention outcomes

Phase	Objects of interest
Context *ex ante*	• Objectives, feasibility, existing situation (Bellamy et al., Mazri, Ostenello and Tsoukiàs) • Roles and relations (Creighton, Katzenbach and Smith)
Process *monitoring*	• Changes (i.e. "ENCORE" - Ferrand) • Planned vs. implemented process (Argyris and Schön)
Results *ex post*	• Final impacts: effectiveness, efficacy, efficiency (Marsh et al., Checkland) • Innovation (Hatchuel)

Bulgarian process: participant evaluation

- **Systematic: ex-ante, after each workshop, ex-post**
- **Example Results: Perceived depth of learning**



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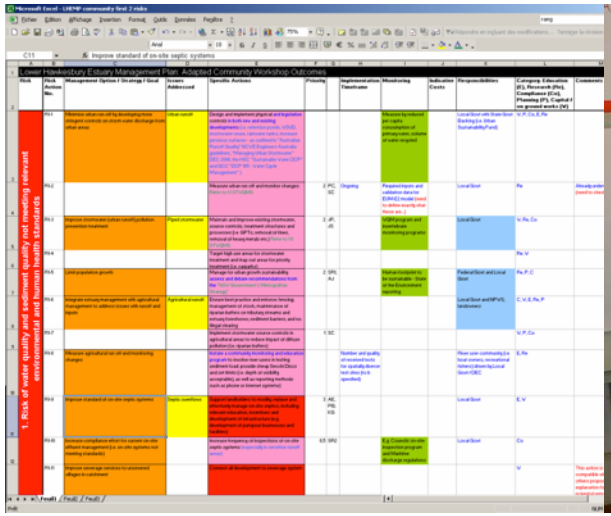
Common process outcomes

- **Action plan creation (with the aid of computer processing)**



- **Evaluation results very similar in both processes**
  - **Increased open sharing of visions and opinions**
  - **Individual and collective learning (greater depth in Bulgaria)**
  - **Capacity to successfully manage conflicts**
  - **Some impacts of the processes on governance and water system sustainability starting to be observed (greater depth in Australia)**

Substantive insights from example processes

- **Australia (estuarine risk management)**
  - Difference in key values for sustainability of the estuary (triple bottom line vs. ecologically based sustainability)
  - Participating stakeholder acceptance of risk evaluation model and results – despite some results not matching intuition
  - Key conflicts over treated waste water releases managed successfully

- **Bulgaria (flood and drought risk management)**
  - Integration of technical and non-technical options (infrastructure, community organisations, education, insurance)
  - All levels of management still face other perceived issues: finances, institutional coordination, corruption, social capacity, pollution

Procedural insights from example processes

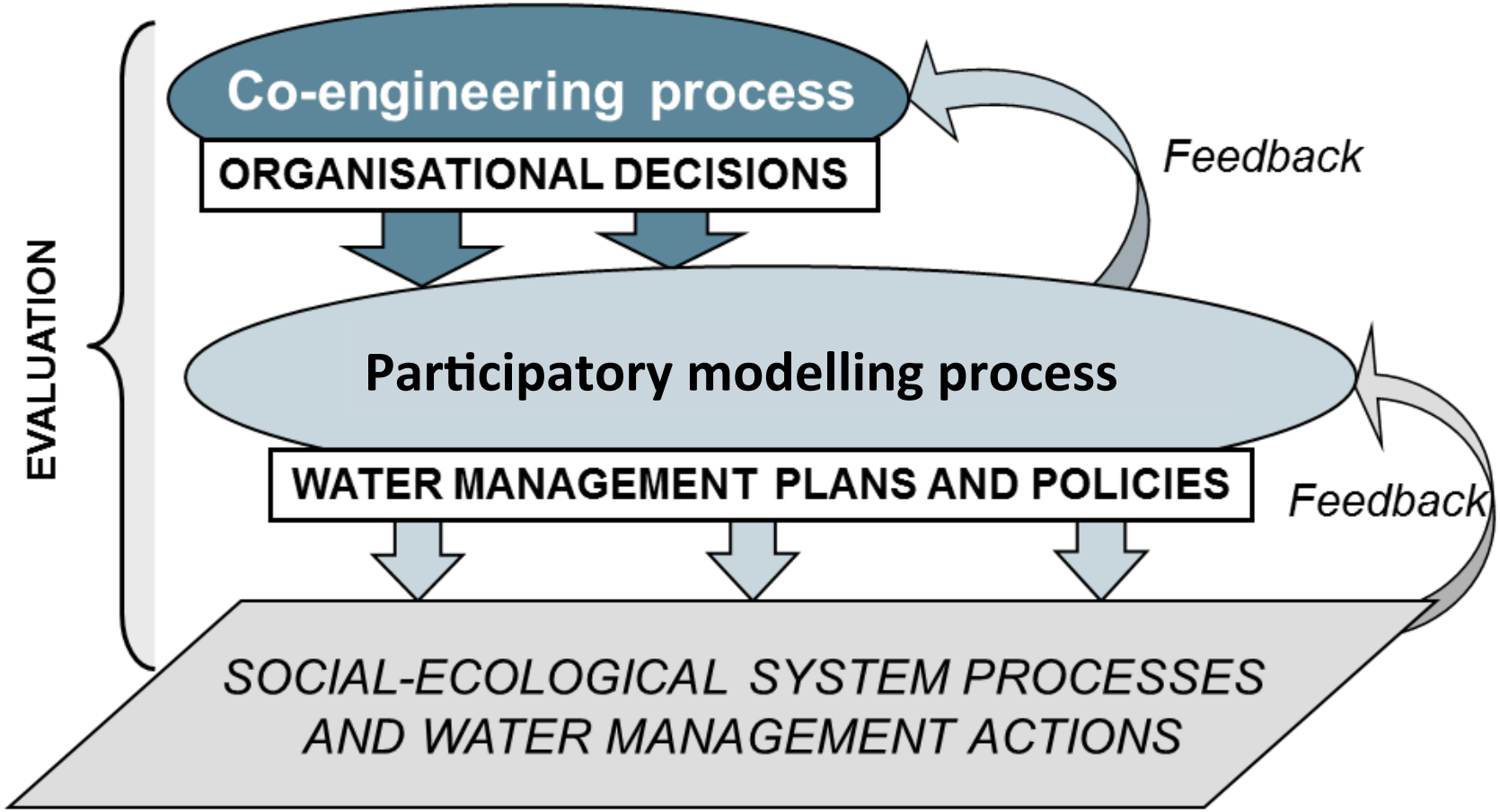
- **Successful multi-level dialogue**
  - Local residents ⇔ ministers (Bulgaria) on complex issues
  - Harnessed advantages of procedural equity & inequity

- **Multi-institutional groups for organisation**
  - Researchers, private consultants, government officials, NGOs
  - Participatory process design negotiated and "co-engineered" for contextual constraints

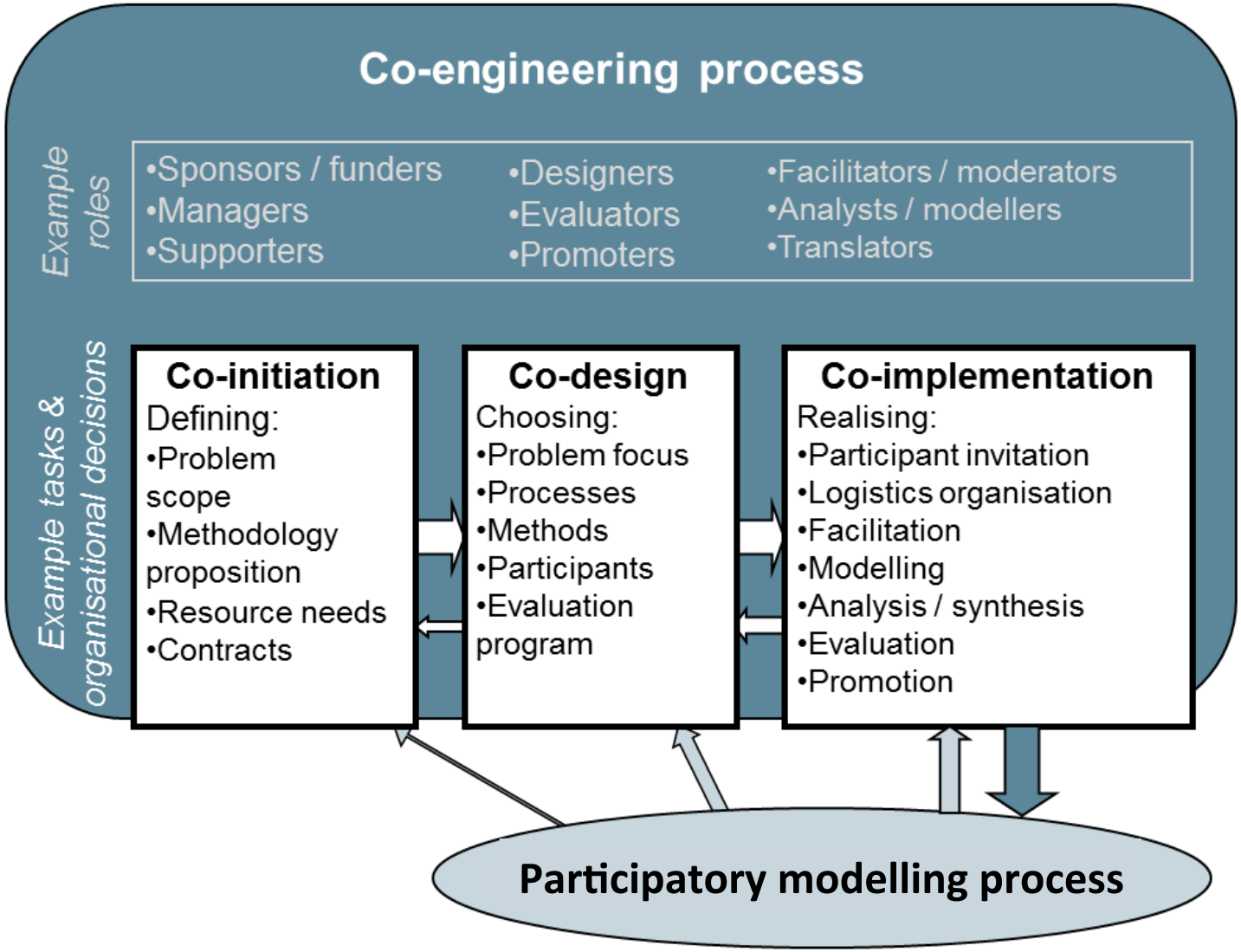
→need to appreciate and manage divergent objectives of organisers and analysts

→There are two participatory processes to organise!

Situating the co-engineering process



Content of the co-engineering process



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Discussion – understanding the subjective nature of risk management

- **Risk management is highly subjective**
  - Many parts of risk management are values-based
  - Individual stakeholder assessments vary
  - Knowledge is dispersed and commonly contested
  - Participatory multi-level assessments

  → Need to seek inter-subjective agreements for action

- **Participatory modelling approaches can save time and money**
  - If well co-engineered and monitored
  - If they have leaders and finance to support them

Discussion – roles and limits of models in participatory planning processes

- Some models are interesting and some are useful
  - They change our perspective on the world
  - They can help us to make specific decisions
  - Complexity is a major challenge
  - Specificity of questions to be investigated is important
- Sometimes the participatory modelling process is more important than the model content
  - It can help decision-makers gain legitimation for action
  - Model validity is not always a key concern of stakeholders
  - Simple analytics that support collaboration
- Sometimes engaging stakeholders in modelling is not necessary or a good idea – learn when it is appropriate

Discussion – future of the urban fringe: water planning and risk management

- Growing need to accommodate new residents and development
- Scarcity of resources (e.g. land, water, energy, air) and numerous potential risks likely to lead to growing conflict
- Growing environmental footprint of cities problematic – long term planning important for maintaining quality of life
- Challenges include
  - Who ought to be involved in decision-aiding and how?
  - Who has the power to organise how decision-aiding processes take place?
  - How to effectively include relevant expertise and models in these processes

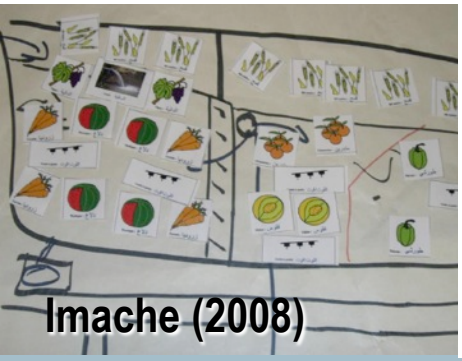
Conclusions and perspectives: lessons for successful participatory modelling

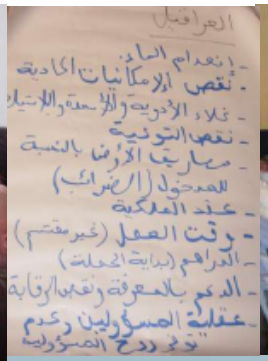
- Developing a strong common purpose for the exercise
- Remember there are two participatory processes to organise!
- Having key implementation (and decision-making) champions involved in the core co-engineering team
  - This helps appropriation of the process, models and results
- Spend time understanding the (multi-level) decision-making environment, culture and politics



Conclusions and perspectives: lessons for successful participatory modelling

- **Remain flexible, adaptive and responsive to learning**
- **Seek advice and use engagement expertise for high-risk processes (research informed practice)**
  - **There is a large literature on and research community that specialises in participatory process design and implementation**
  - **Include participatory process specialists in the co-engineering team**
  - **Develop communities of practice that can support co-engineering and participatory water planning and risk management processes**


Imache (2008)



Acknowledgments

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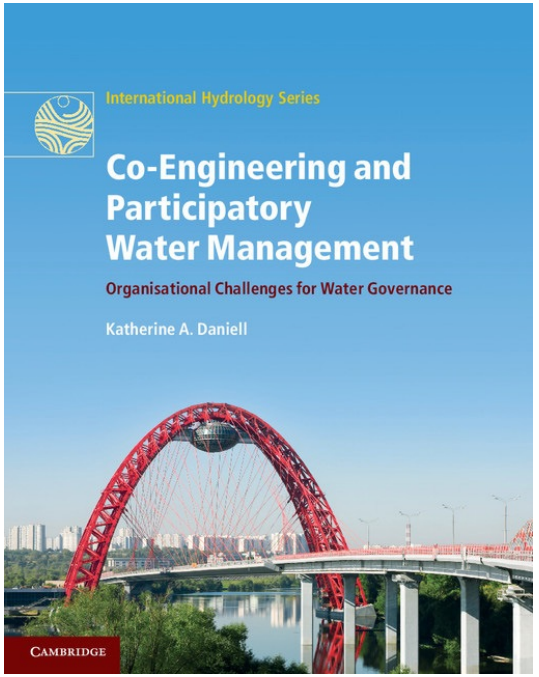

Or see the following 2012 book / 2010 paper references:

Daniell, K. A., I. White, N. Ferrand, I. S. Ribarova, P. Coad, J.-E. Rougier, M. Hare, N. A. Jones, A. Popova, D. Rollin, P. Perez, and S. Burn. 2010. *Co-engineering participatory water management processes: theory and insights from Australian and Bulgarian interventions*. Ecology and Society 15(4): 11. [online] URL: http://www.ecologyandsociety.org/vol15/iss4/art11/