



6FP EU SCENES project



Tomasz Okruszko – WULS
on behalf of Scenes project group



Structure of the presentation



1. Scenario - what is it?
2. Basic characteristics and objectives of SCENES
3. Organisation and set-up
4. Phases of SCENES
5. GEO-4 scenarios
6. Modelling approach
7. Indicators and their quantification
8. First results
9. Conclusions



What is a scenario?

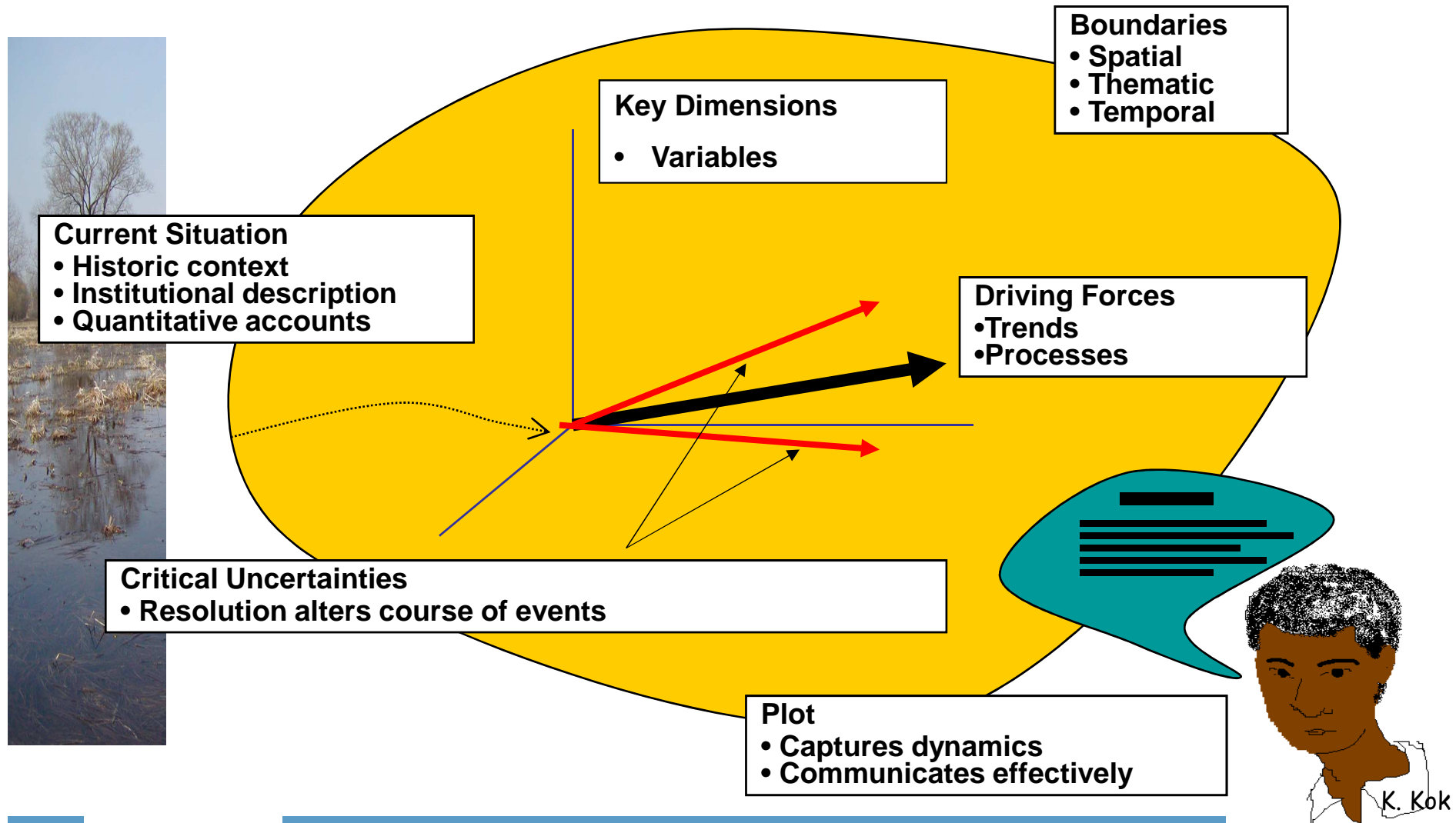
What is NOT a scenario?

Scenarios are not forecasts, projections, or predictions.





Scenario anatomy





Water Scenarios for Europe and for Neighbouring States



6th EU Framework IP Project

4 years - 1 Nov. 2006 - 31 Mar. 2011

2 Co-coordinators at CESR and SYKE

23 partners, 17 countries

7 Million euros EU contribution



Aim of the project



To develop and analyse a set of **scenarios** of Europe's freshwater futures up to 2050

The scenarios will:

- provide reference point for strategic planning
- alert policymakers and stakeholders
- allow river basin managers to test water plans



Four overarching objectives for the whole project duration



- 1) *To improve different methodologies for developing scenarios of Europe's waters.*
- 2) *To develop and analyze a set of comprehensive scenarios of Europe's fresh waters up to 2050 through a participatory process.*
- 3) *To evaluate the socio-economic, environmental and ecological impacts of the different water scenarios.*
- 4) *To increase the stakeholder awareness on the water scenarios and help in launching an on-going process in Europe of scenario-development.*



Characteristics of the project

- Scenarios for water quality and quantity

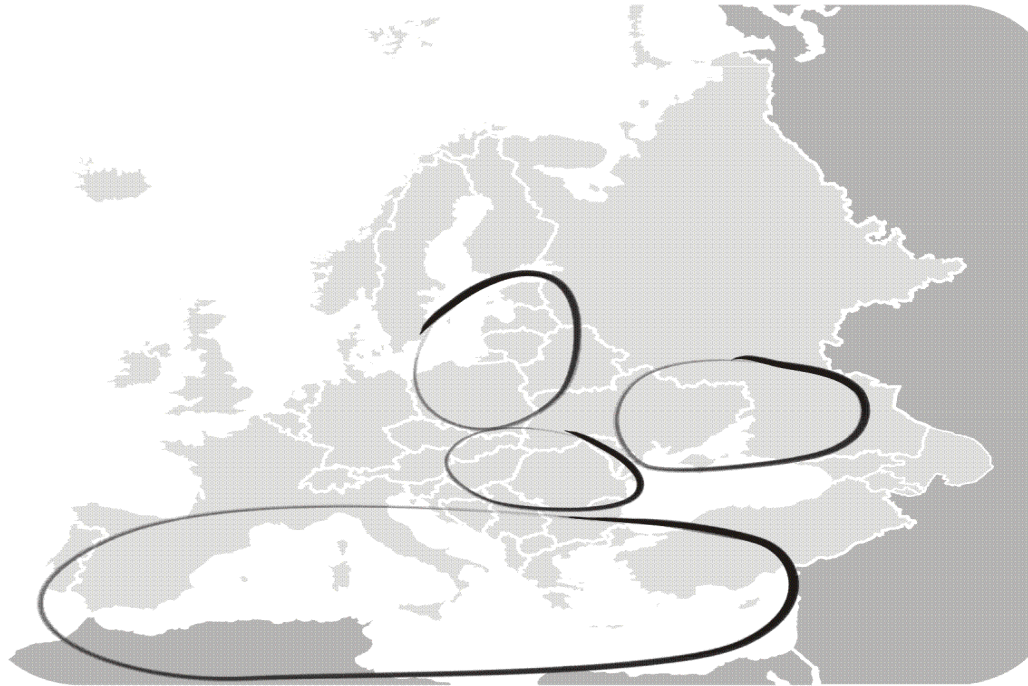


- Qualitative and quantitative scenarios
- On a pan-European scale
- Using stakeholder participation, modelling and indicators



Project area

three levels: pan-Europe, regions ...



BALTIC REGION

- transition of agriculture
- privatization of water supply systems
- mixed trends in water consumption both municipal and industry
- probably increasing GDP and the changes in the life style
- HELCOM future

BLACK SEA REGION

- change in agriculture, unknown future
- salinization of the irrigated fields
- decapitalization of hydraulic structures
- unknown future for the ownership and operation of water supply and sewage treatment plants
- consumption of water by heavy industry
- negative population trends

MEDITERRANIAN REGION

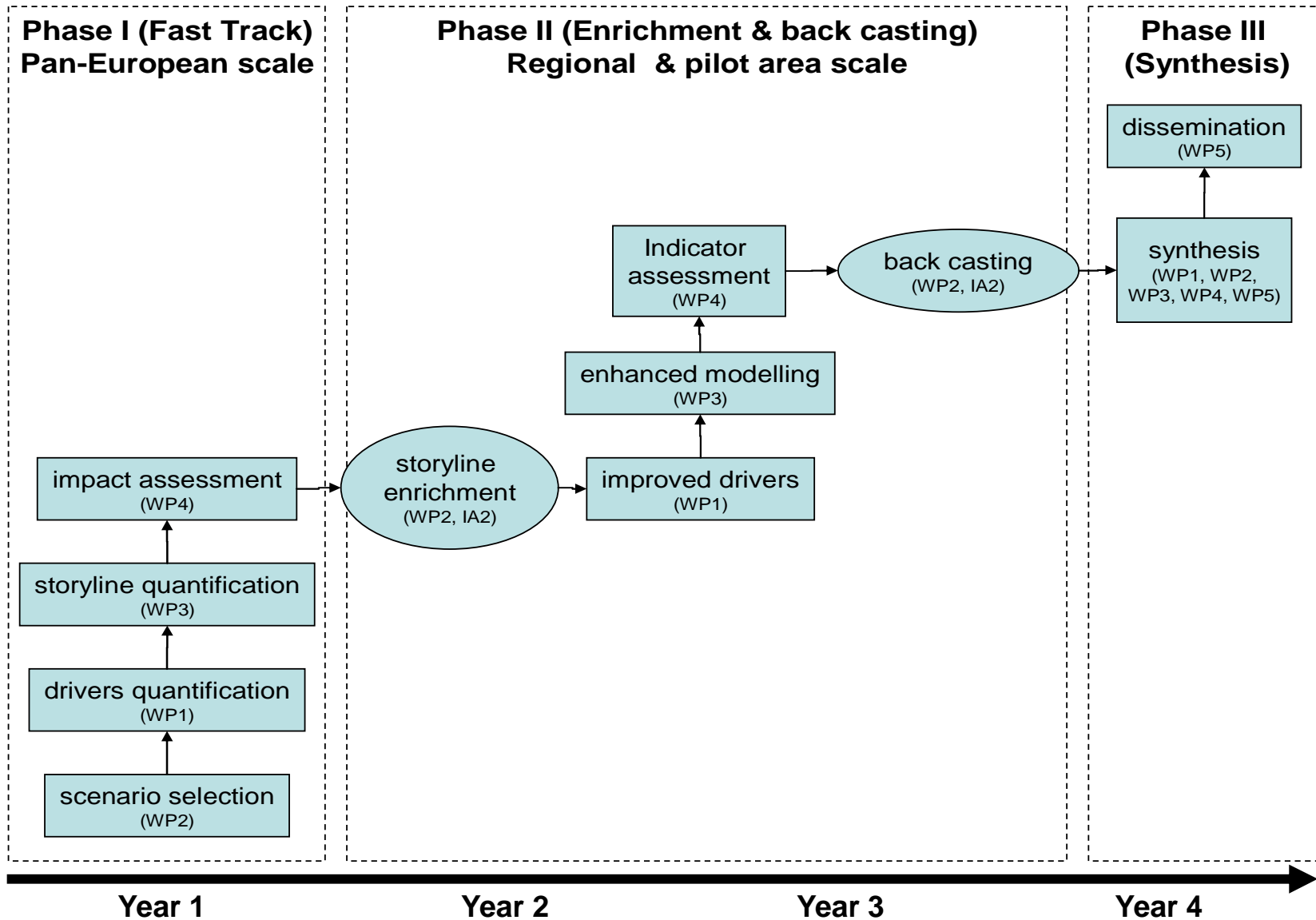
- water stress
- land use change
- water use, irrigation
- population trends, immigration
- change in agricultural policy

LOWER DANUBE REGION

- economic transition
- water pollution issues
- change in agriculture and land-use
- flood and drought management

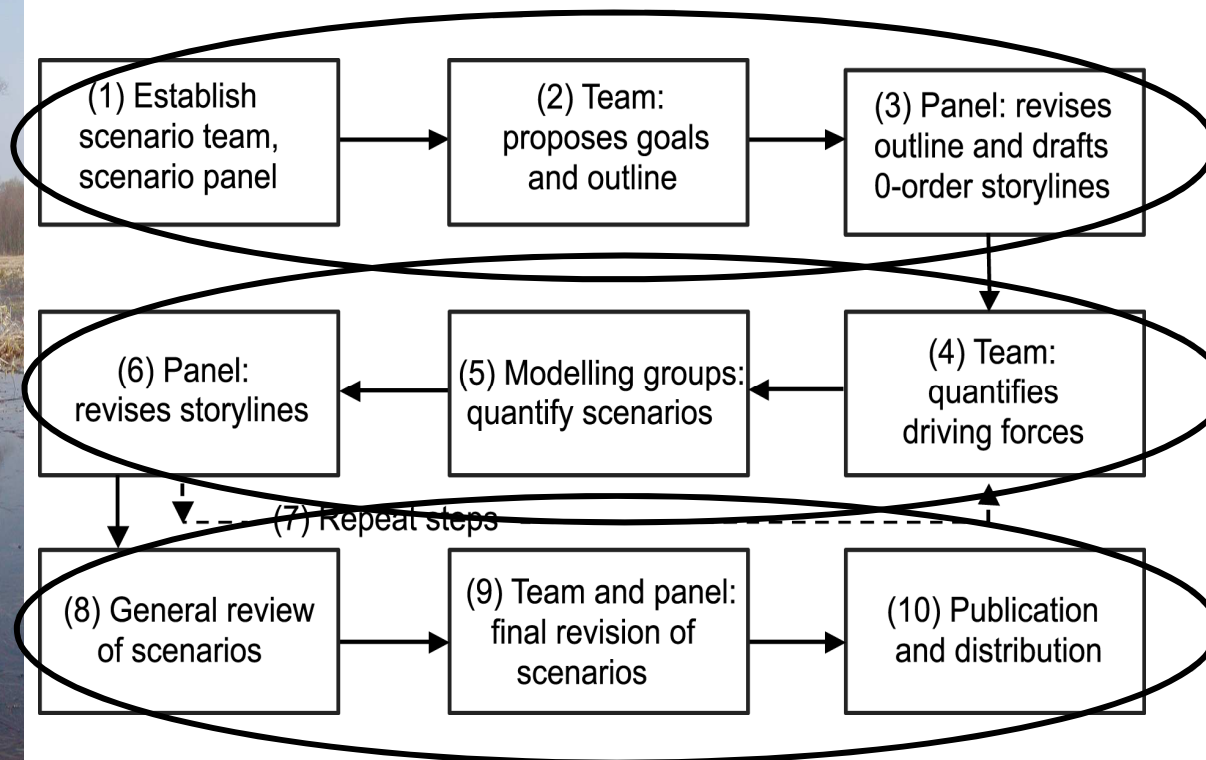


Phases within SCENES





Scenario development methodology: Story and Simulation (SAS)



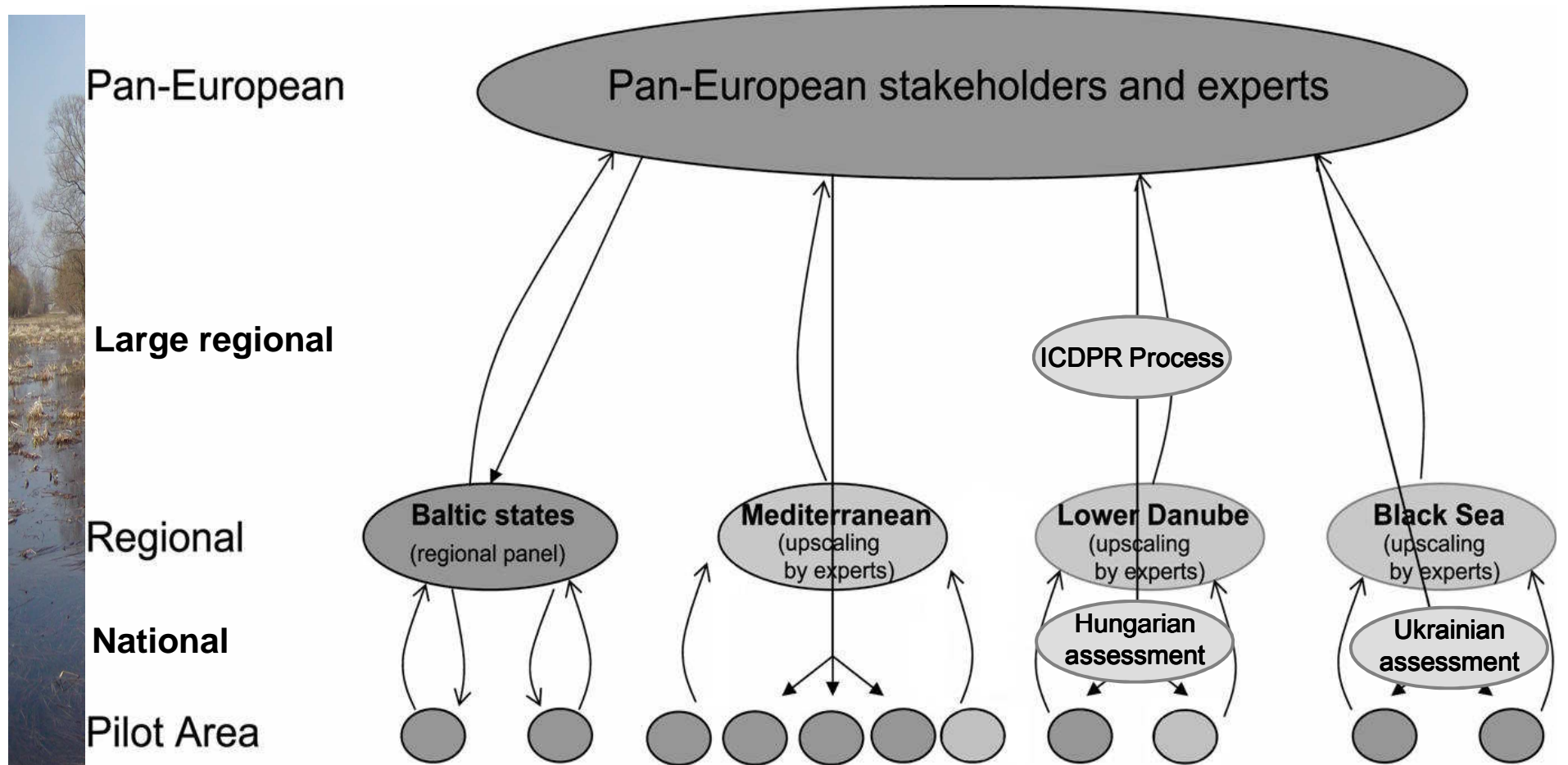
Narrative storylines

Model runs

Review and dissemination



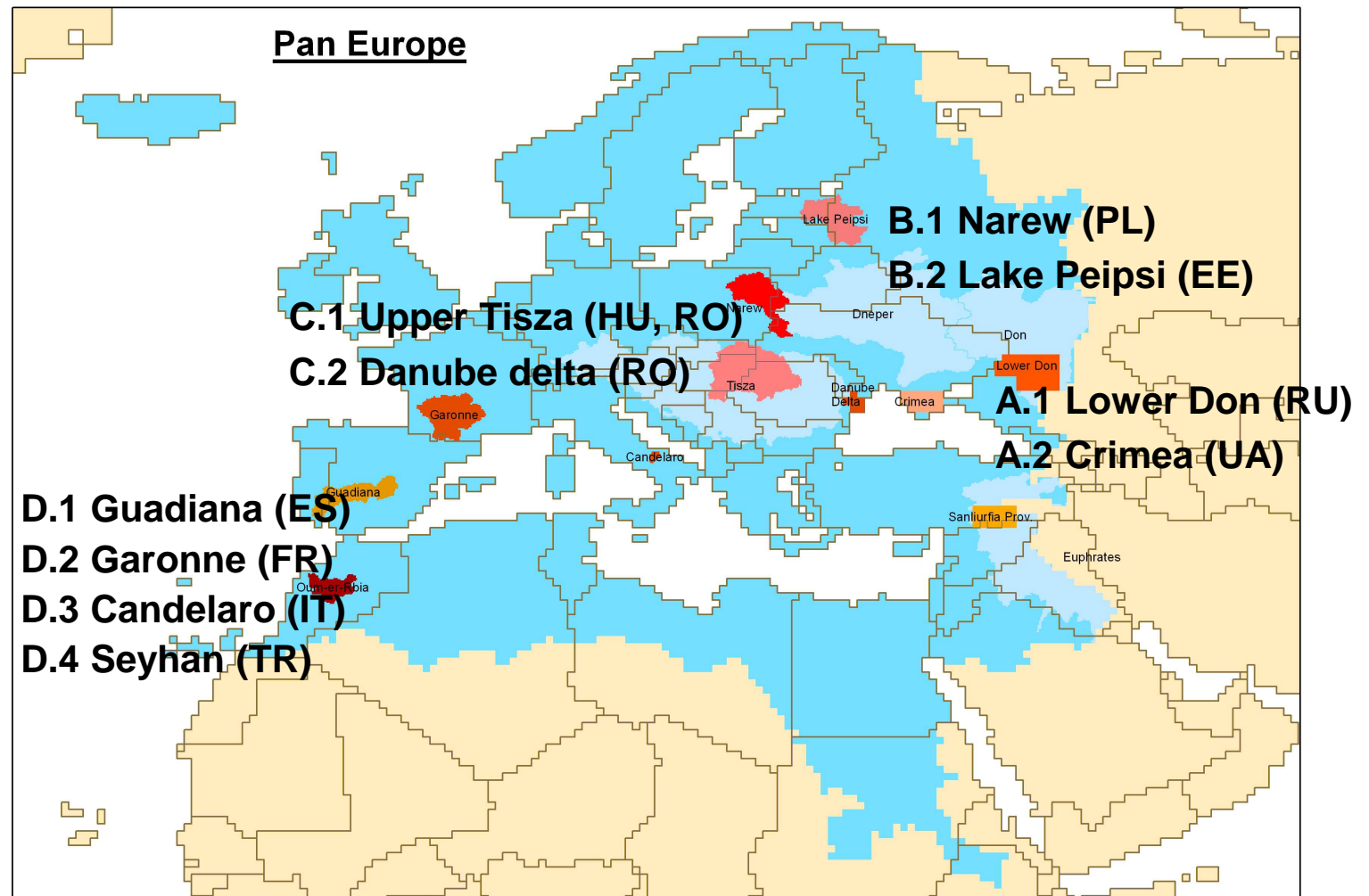
Stakeholder panels at different scales





Project area

... and Pilot Areas



C. Schneider, CESR



Pilot Areas - multiple methods



- **Qualitative**
 - Card techniques / Delphi-technique
 - Discussion groups
 - Collages / Rich pictures
 - Time lines
- **Semi-quantitative**
 - Fuzzy Cognitive Mapping
 - Causal Loop Diagrams (background language)
 - time trends
- **Quantitative**
 - Local models
 - WaterGap (PA level)



Scenario Development Process: Four steps

1. Present and near future
2. Looking at the future (developing visions)
3. Critical review of developed visions
4. Playing it back

why four steps:

- *Present as foundation*
- *Then jump into the future*
- *Review future with input from other WPs*
- *Then focus on time in between present and future -> policy options for short & middle term*





Step 1; Present and near future

- Analyse present and near future:
 - Main factors and actors: Card-technique / Delphi-technique
 - Importance of factors/actors: spidergrams
 - Relations: Fuzzy Cognitive Map (FCM)
 - Where are there relations?
 - How strong are the relations?





Step 2; Developing visions

- Envisioning workshop; use fast-track scenarios as framework.
 - Introduction of fast-track scenarios
 - Quick discussion about effects on PA.
 - Make visions of future under each scenarios (collages / rich pictures)
 - Plenary discussion of developed visions
 - Show new/different relations in presentation
- Strength of factors/actors (spidergram)





Step 3; Review of developed visions

- Critical review of developed visions
 - Local models(?)
 - Questionnaires
 - WaterGap
- Outcomes of FCMs of visions
 - compare with ideas of stakeholders
- Reformulating visions and FCMs
- Effects of critical events





Step 4; Playing it back



- Start with the future (visions)
- Work back to present day
- Use FCMs of future and present
 - What has changed in the system?
- policy actions needed to change the system (timeline)
 - (focus on short and medium term actions)
- Make time trends (fuzzy graphs)
- Present plenary

- Find commonalities between visions



Proposed methods



- Qualitative
 - Card techniques / Delphi-technique
 - Discussion groups
 - Collages / Rich pictures
 - Time lines
- Semi-quantitative
 - Fuzzy Cognitive Mapping
 - Causal Loop Diagrams (background language)
 - time trends
- Quantitative
 - Local models
 - WaterGap



Qualitative methods: Card technique / Delphi technique

- Used to organize, cluster and rank information
- Participants put main issues concerning the subject on post-its (3 per person)
- Issues that are closely linked are clustered
- Each cluster is given a name or description
- Input for FCM's and visions





Qualitative methods: Collages

Visual representation of a scenario

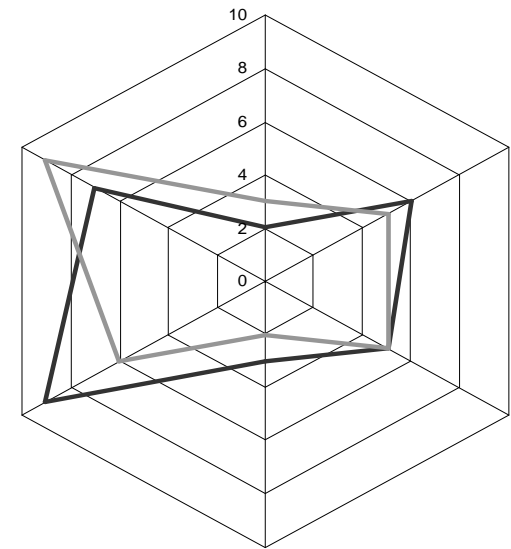
- Meaning of pictures told during presentation
- Report on scenario development
- Report on scenario contents





Qualitative methods: Spidergrams

- Represent the importance and influence of various factors
- Rank aspects on the axes
- Easy to compare visions on multiple aspects
- Use the clusters from card-sessions





Qualitative methods: “Timeline”

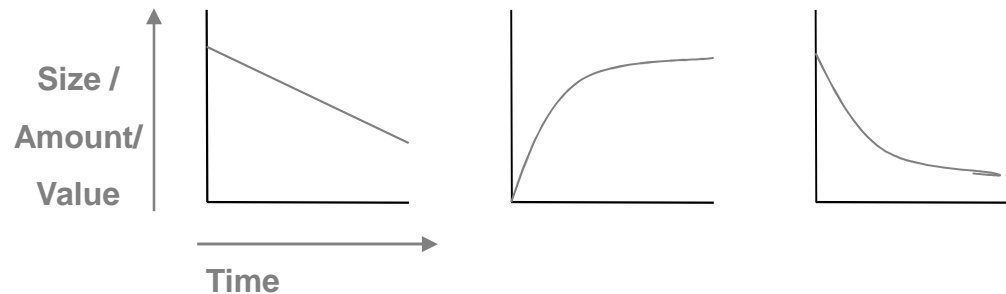
- Make a time line starting at present to future
- Think about the things that need to change / blockades that need to be overcome
- What needs to be done first, what later?
- Plot the (policy) actions on timeline
- The focus is on short and medium term goals





Qualitative methods: “timetrends”

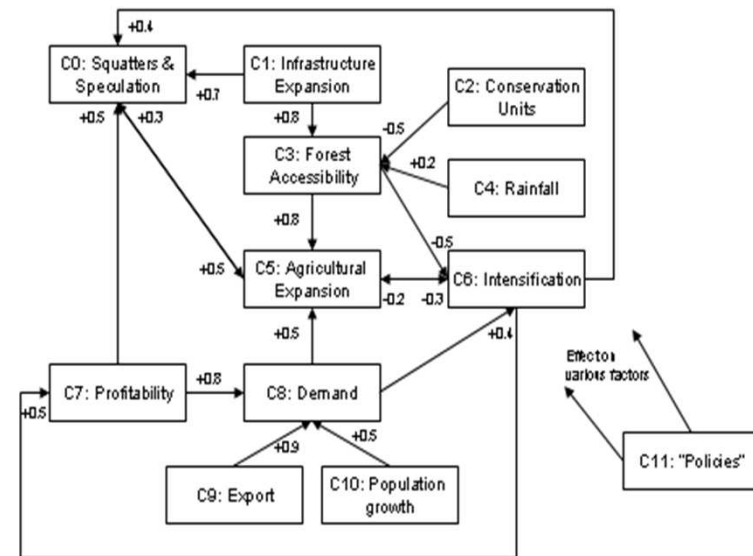
- Start with the timelines
- Make a timetrend of every important issue / indicator to show how it develops in time.





Conceptual models: Fuzzy Cognitive Maps

- Card-technique rich pictures and spidergrams session form input.
- Main drivers, pressures and other variables
- Include feedbacks / relations
- which way do they work (positive/negative)?
- How strong are relations?

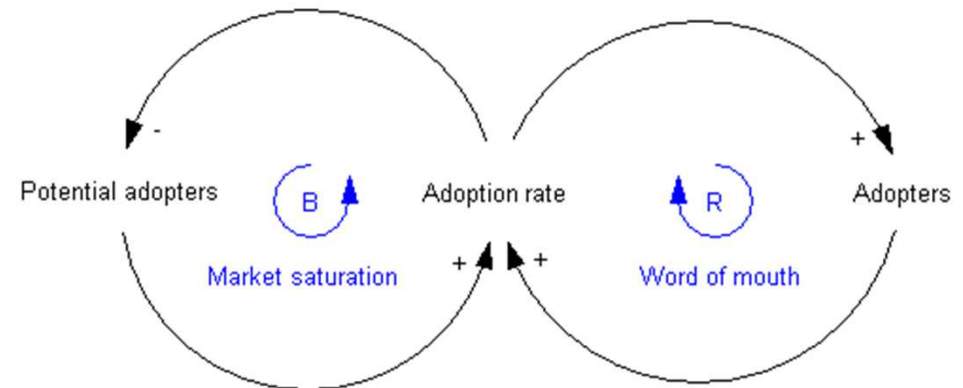




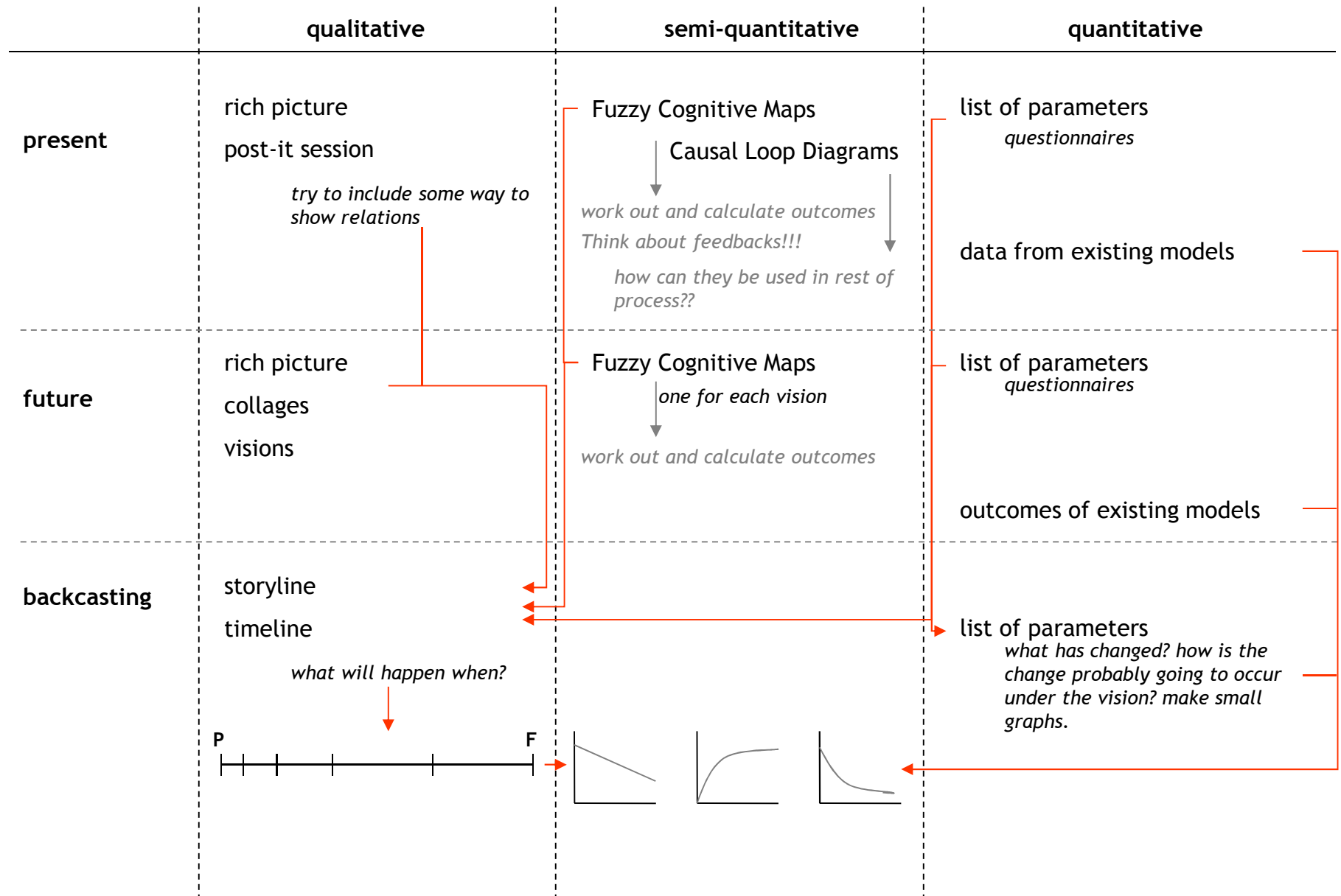
Conceptual models: Causal Loop Diagrams



- Background language
- Look at main variables
- What are the causal relations?
- Include feedbacks
- Label polarity: positive or negative loops?
- No fuzzy values
- Always create loops



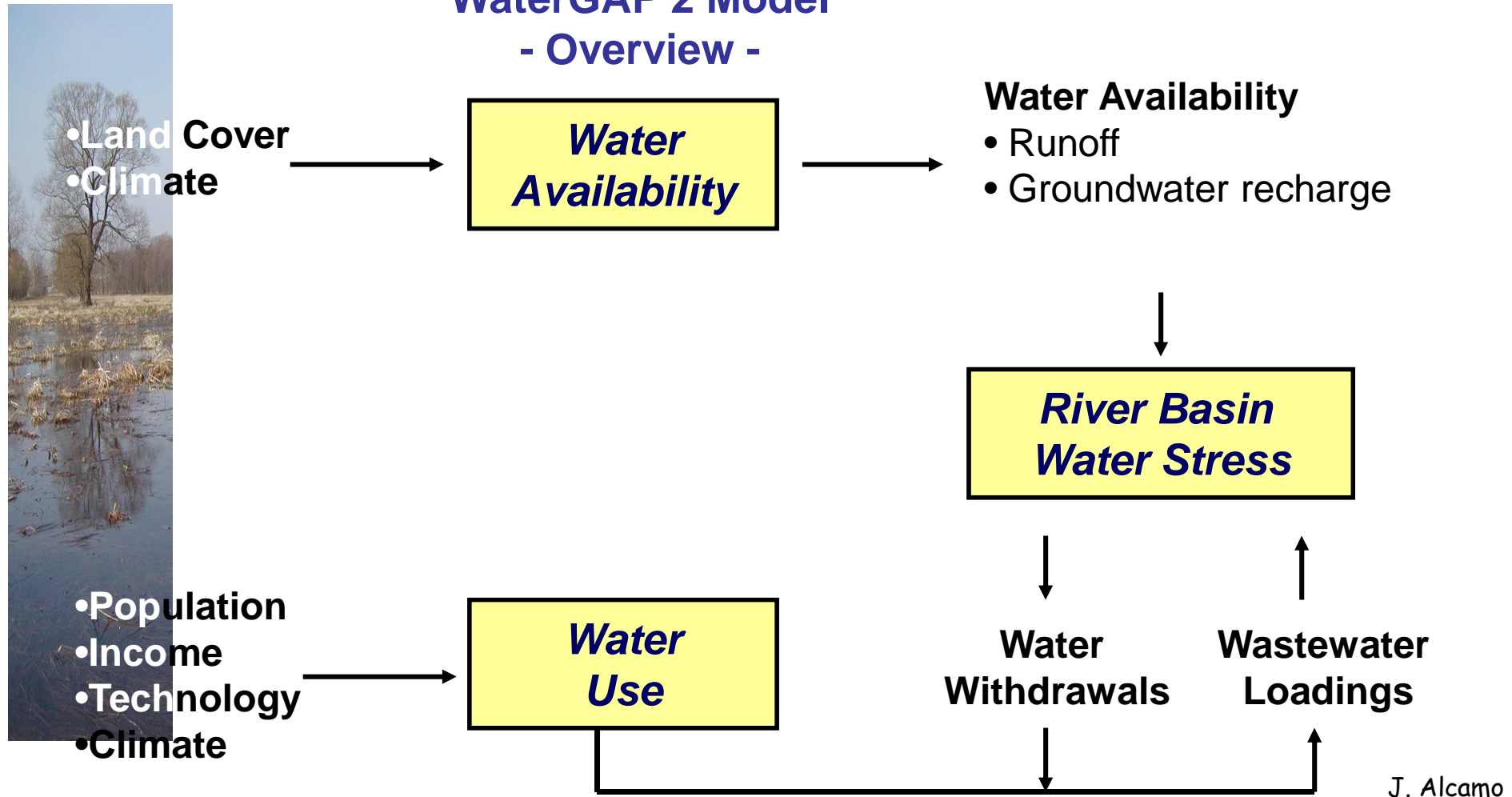
The use of different types of methods in the SCENES scenario development process





Modelling approach

WaterGAP 2 Model - Overview -





Example - Annual Total Water Withdrawals (2000 - 2030)

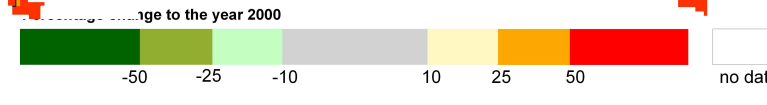
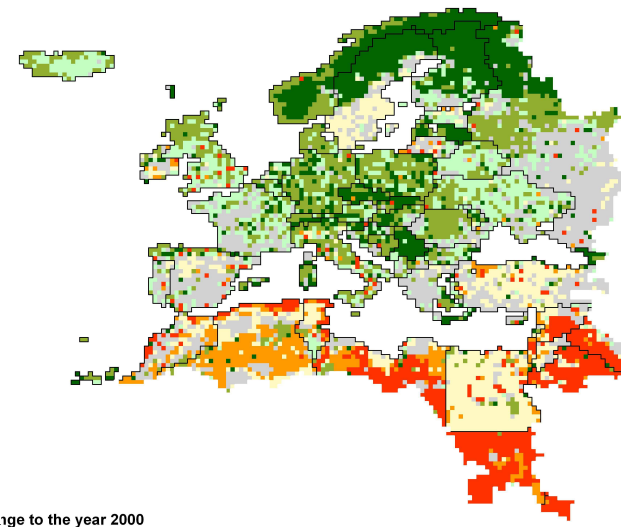
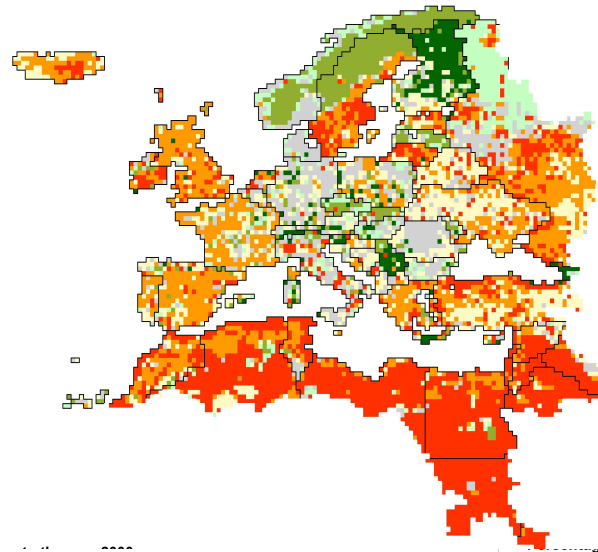
Change (%)

Security First

Sustainability First

Change in total water withdrawals
(Security First, 2030)

Change in total water withdrawals
(Sustainability First, 2030)



(c) Center for Environmental
Systems Research,
University of Kassel,
July 2007 - WaterGAP 2.1e





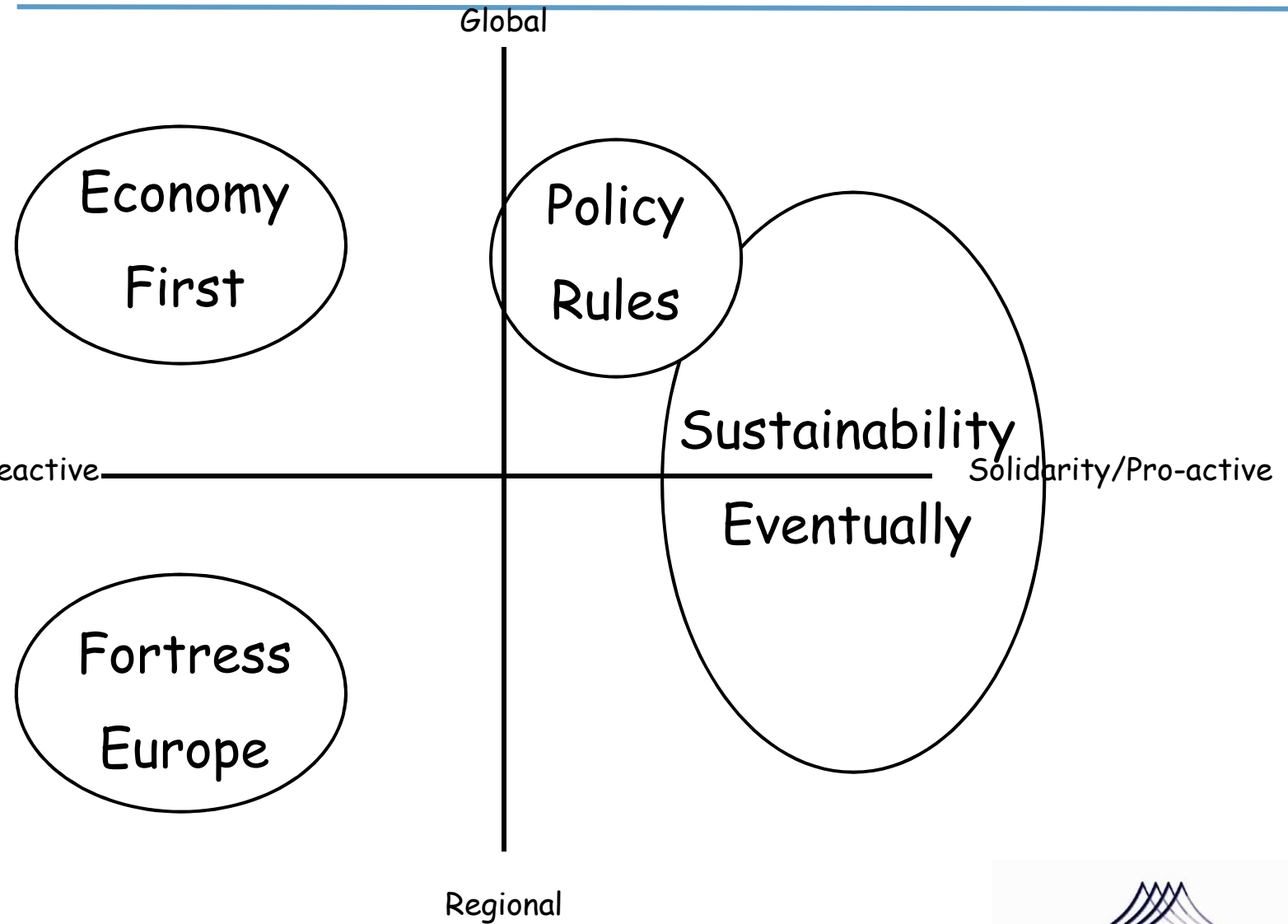
Approach for quantitative analysis

- Analysing the socio-economic and environmental and ecological impact of changes in water resources for different water system services and water sectors
 - ✓ agriculture (irrigation), biodiversity, drinking water supply and sanitation, recreation and tourism, industry, hydropower, cooling water
 - ✓ clustered in 4 groups
 - ✓ water for food
 - ✓ water for nature
 - ✓ water for people
 - ✓ water for industry
- Quantification by using indicators





Global scenarios



Increasing market



for EU produced goods



Fortress Europe

Energy crises

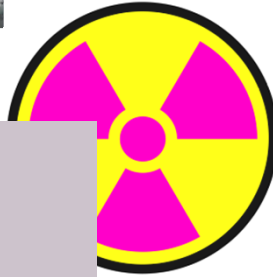
climate and financial



Cooperation is difficult



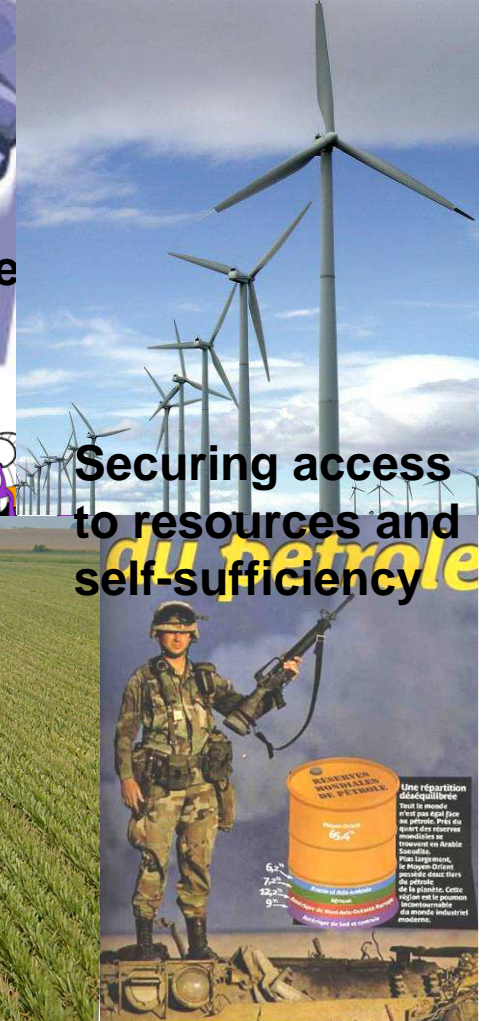
But perceived there keep EU together



Europe closes borders
Concentrates on security issues



Securing access to resources and self-sufficiency



low attention to environmental effects



WFD becomes Water Security Framework



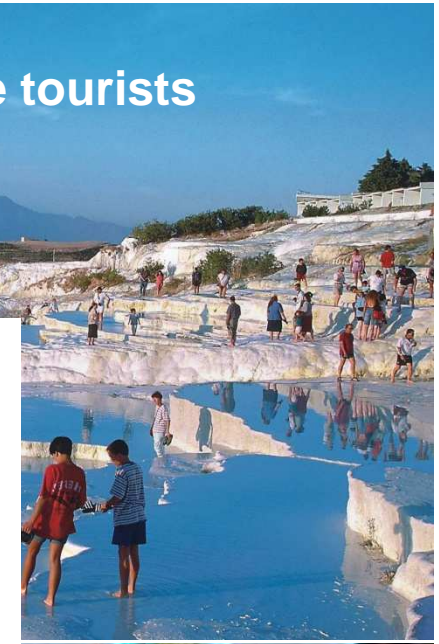
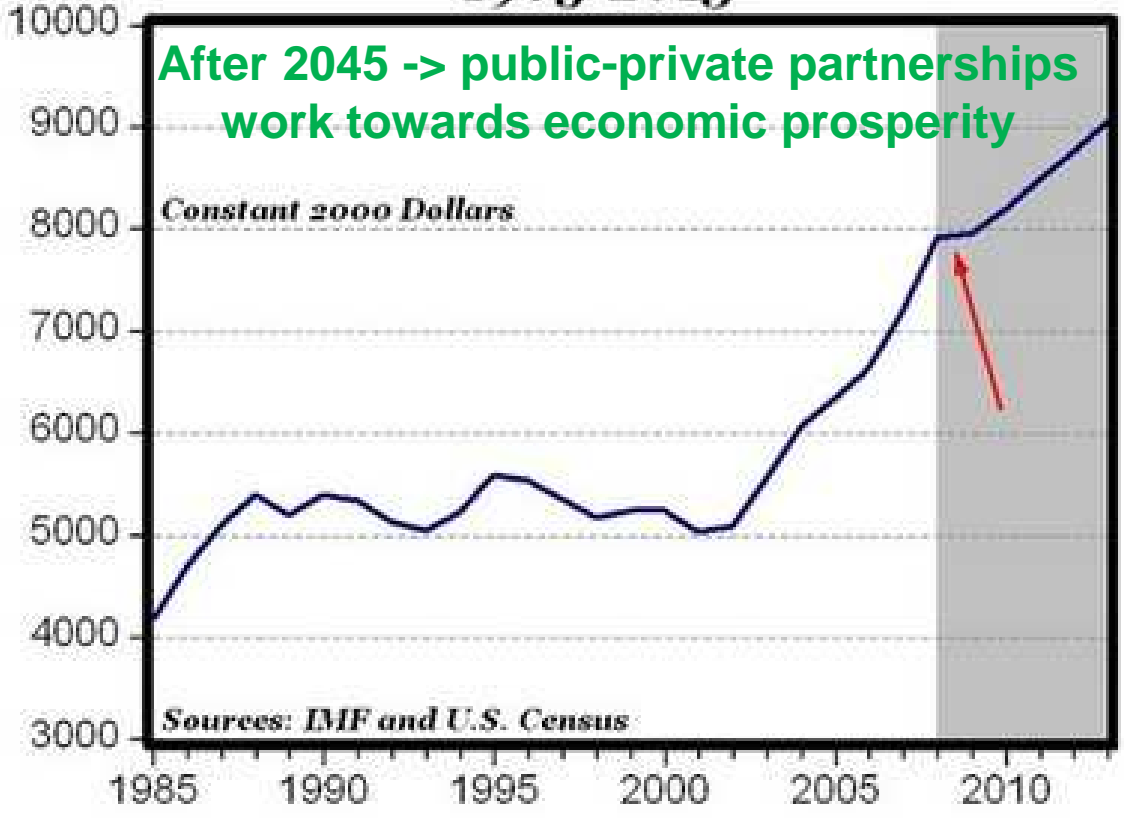
high-tech
alternatives
fossil fuels

more tourists

in
spre



World Real GDP Per Capita 1985-2013



diversive i
c
water q

more opportuniti
for those that can

slow diffusion of water-efficient
technology, low water-saving
consciousness & higher water prices

Policy Rules

Stronger coordination
EU policies

But policies still
ineffective

2050 Europe forefront of a new socio-economic
paradigm of public/private partnerships

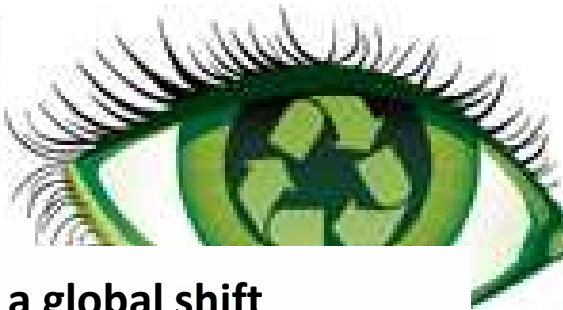
2030: Climate
change hits hard,
public apathy

Ecosystems
deteriorate

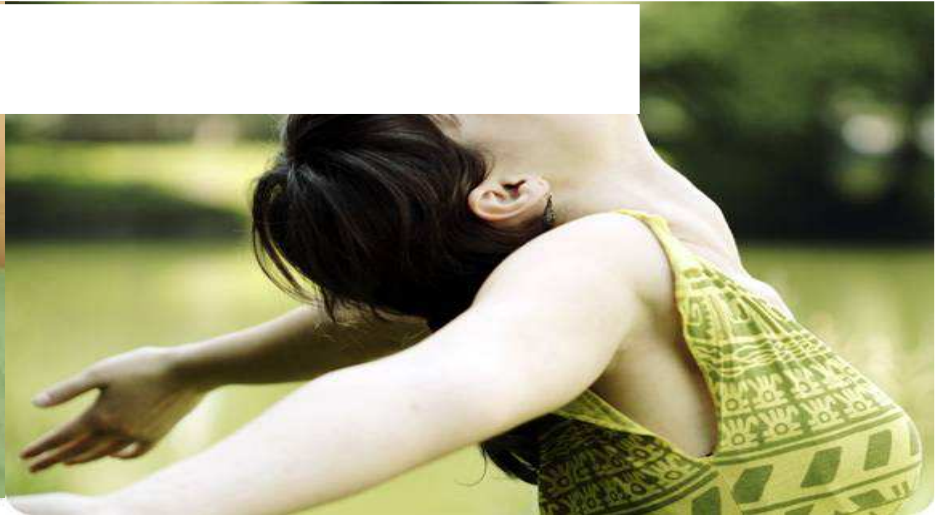
that leads to a global shift

Public participation
increases

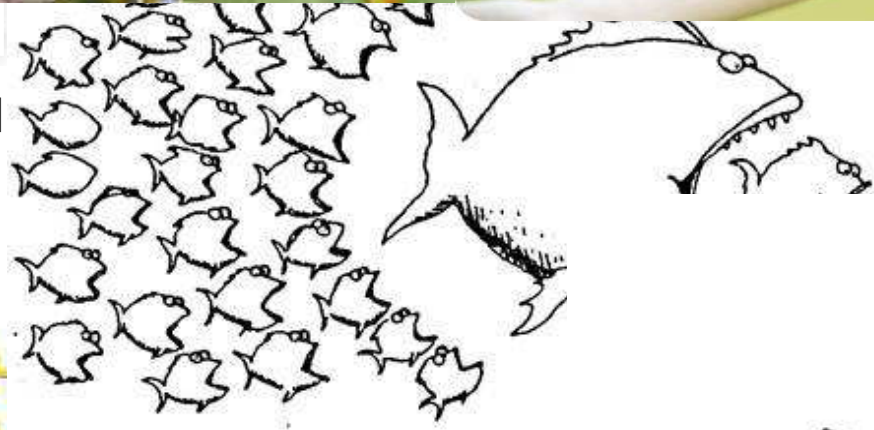
After 2030 WFD
compliance higher than
ever



Sustainability Eventually



2015 WFD updated and more powerful



Landscape becomes basic unit



environmental issues dealt with by eco-region



Next 5 pics are coming from:

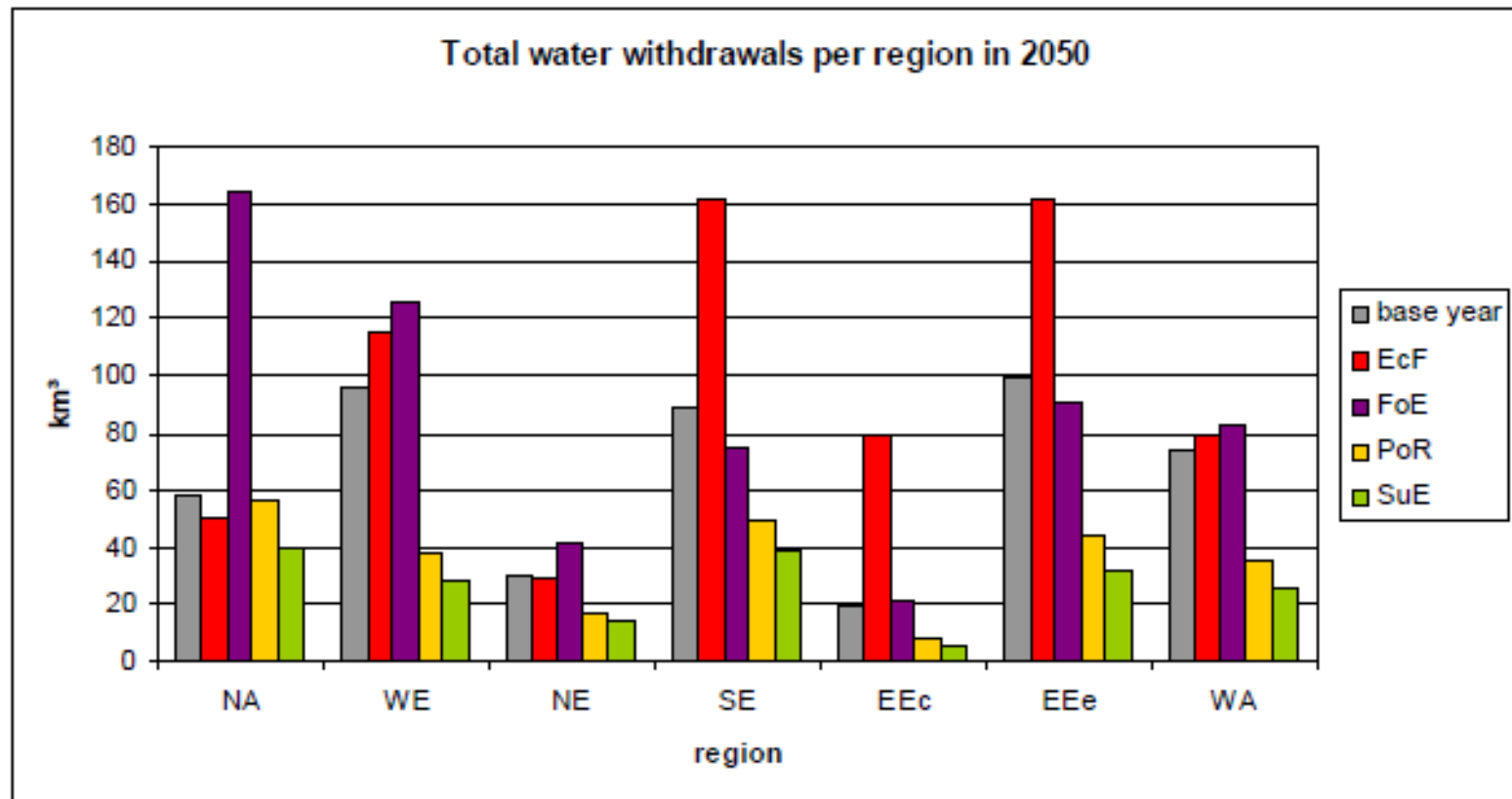


- **Key Messages for the future of pan-Europe's water resources. Post-PEP3 results**
- **Martina Flörke, Ilona Bärlund, Christof Schneider, Ellen Kynast**
- **Center for Environmental Systems Research, University of Kassel**



Key message 1

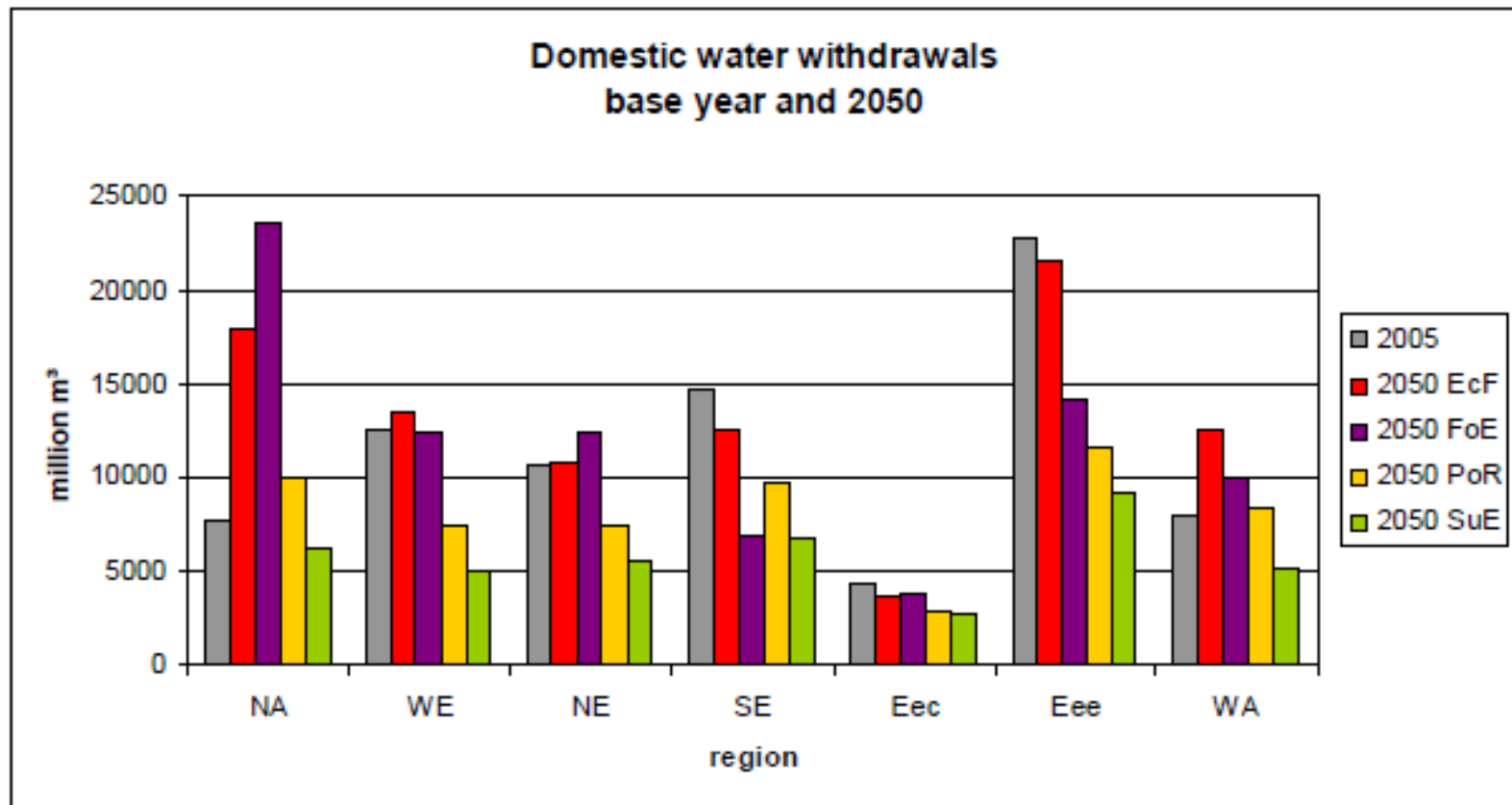
- **Future water uses are expected to increase or decrease, depending on the region and on the scenario.**





Key message 2

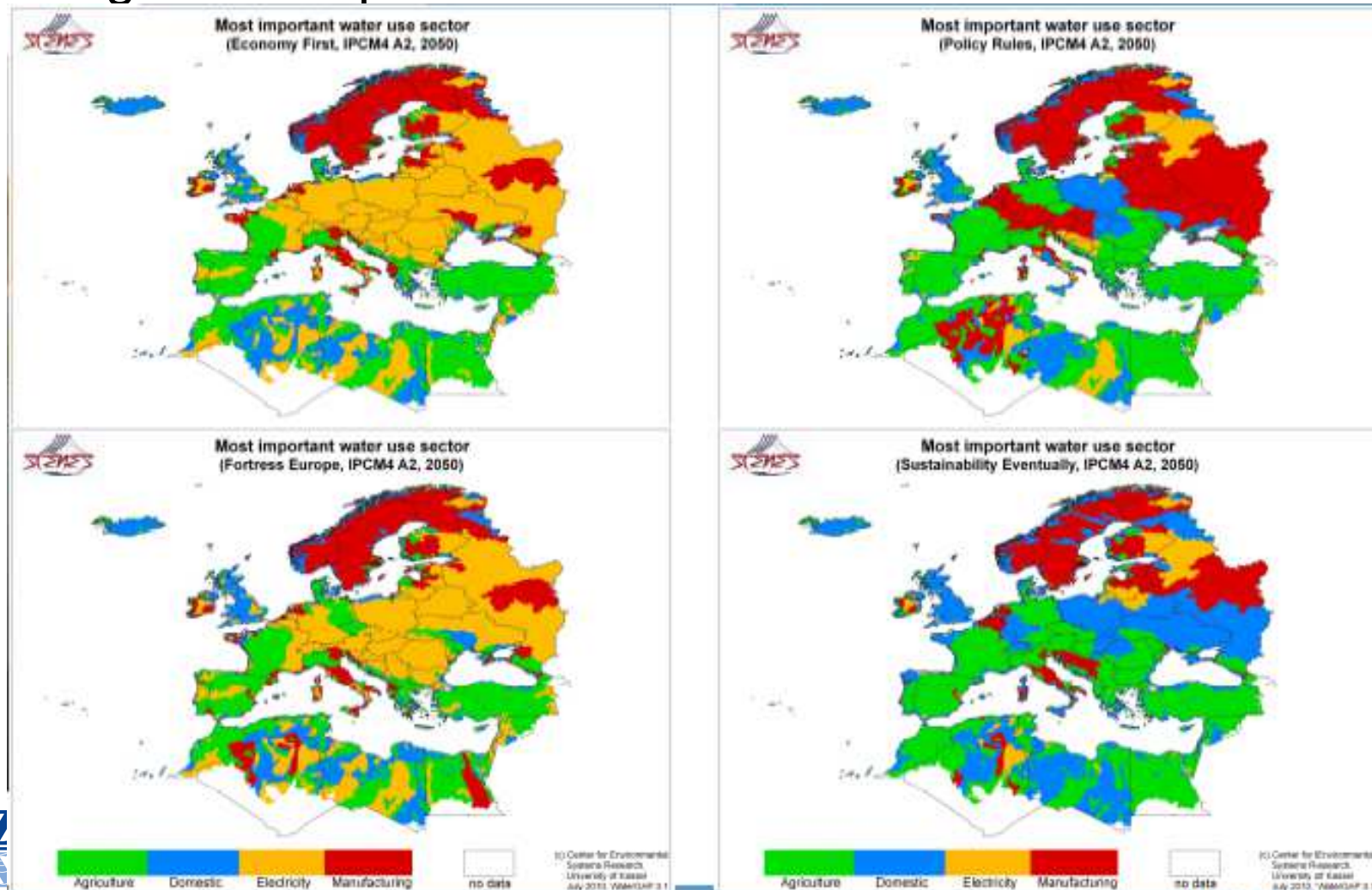
- **Rising awareness to save water, e.g. domestic water uses**





Key message 3

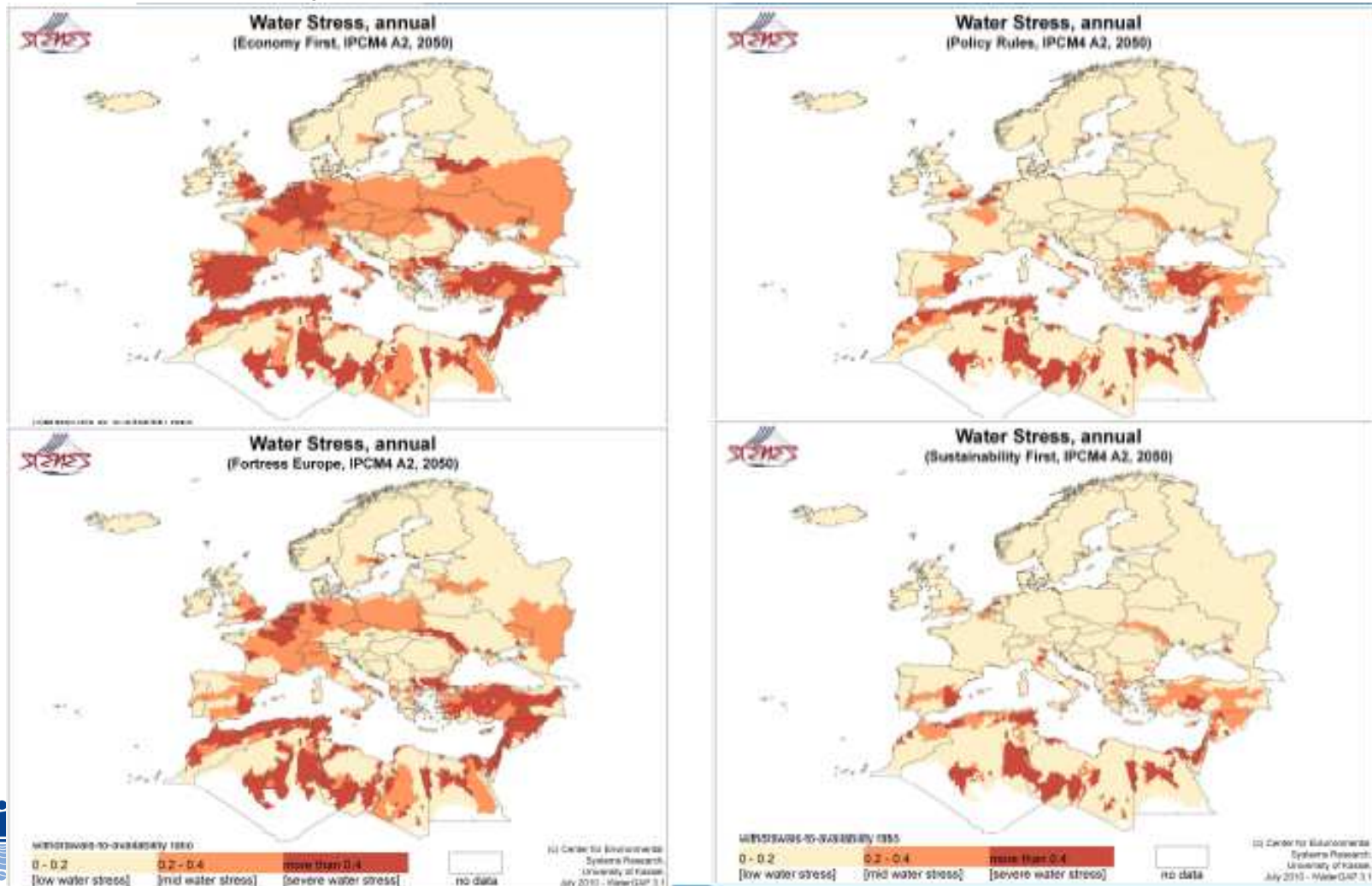
- The profile of water use is expected to change, e.g. most important water user





Key message 4

- **Water stress can be reduced, e.g. withdrawals-to-availability ratio.**





Conclusions on key messages



- Water stress can be reduced
- BUT the profile is expected to change
 - Agriculture major water user
 - Risk of increased diffuse pollution
 - Risk of degradation of water quality
- Key messages could support to stimulate policy discussions about adaptation strategies.



4 next for Baltic region from:

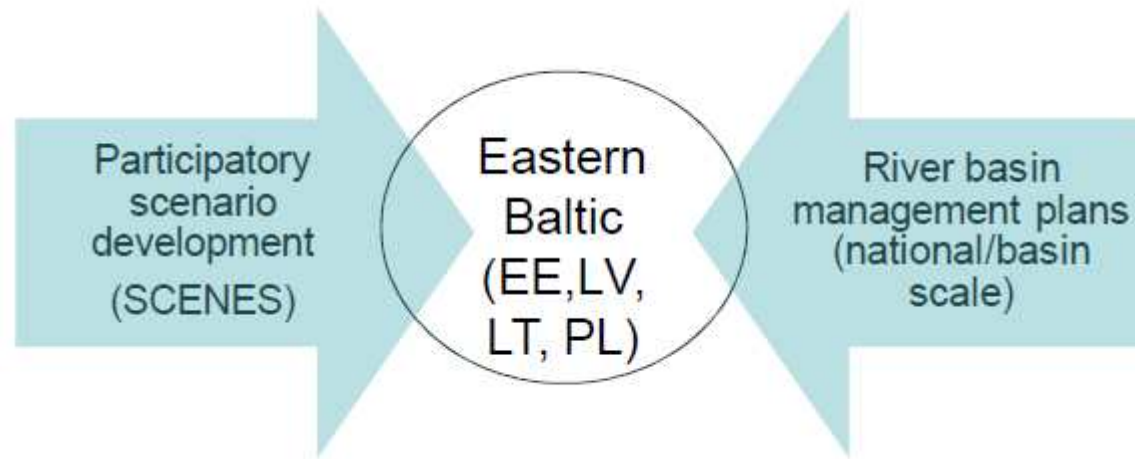
- **Participatory scenarios for regional water management planning: An Eastern Baltic case study**
- **Kristīna Veidemane, Arvo Iital, Marek Giełczewski, Edgars Bojārs**
- **Baltic Environmental Forum, Latvia**





Aim of the study

- To support the regional water policy development
 - to explore synergies between scenario development in the river basin management planning processes





River basin management planning process



- The WFD transposed into national legislation
 - the key policy instrument for water management
 - today and drives future policy trends in the E Baltic;
- Assigned river basin districts in the E Baltic,
 - mainly transboundary districts (8 out of 9), shared also with non-EU countries;
- The same river basin management schedule in the
- region:
 - 6 year cycle, plans to be adopted in Dec 2009



Outcomes of Baltic workshops



- Linking fuzzy cognitive mapping and river basin management planning - *2 key conclusions*
 - Water quality aspects - major concern for water resources in the region (FCM/stakeholders and RBMP)
 - Agricultural pollution – most significant pressure for water quality in the region



Significant pressures on water resources



	Eastern Baltic Panel, FCM	Poland, Vistula RBD	Estonia, East Estonia RBD	Latvia (Daugava)	Lithuania (Nemunas)
Point sources (wastewater discharges)	Important	Important	Important	Very important	Very important
Diffuse sources (agriculture pollution)	Very important	Very important	Very important	Important	Very important
Water abstraction	Less important	Less important	Less important	Less important	Less important
Regulation of water flow and morphological changes	Less important	Less important	Important	Very important	Less important



Conclusions-Questions

- Scale issue and local models
- Climate Change
- Scenarios as a tool for water management (A&D)
- „key messages”

