



DEVELOPING TRANSBOUNDARY MONITORING NETWORKS IN EUROPE

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Outline

- Pilot projects
- Water management analysis
- Structured breakdown of objectives
- Lessons learned
- Conclusions



Objectives of the pilot projects



- To *demonstrate* application of the UN ECE guidelines on monitoring and assessment of transboundary rivers
- To *support* countries in their application
- To *learn* from the experience gained in the pilots and identify gaps or weaknesses for their review

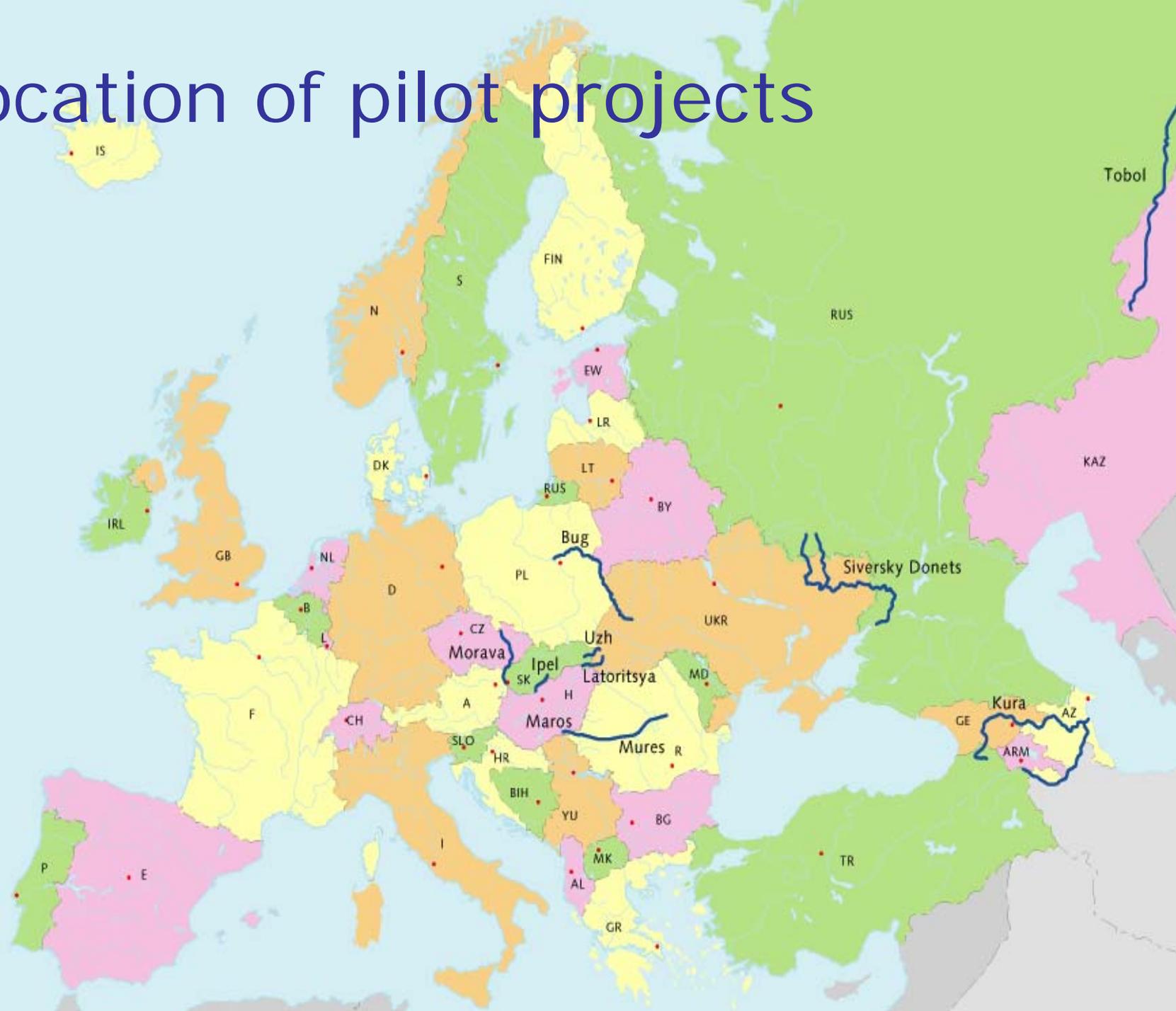


Multiple objectives

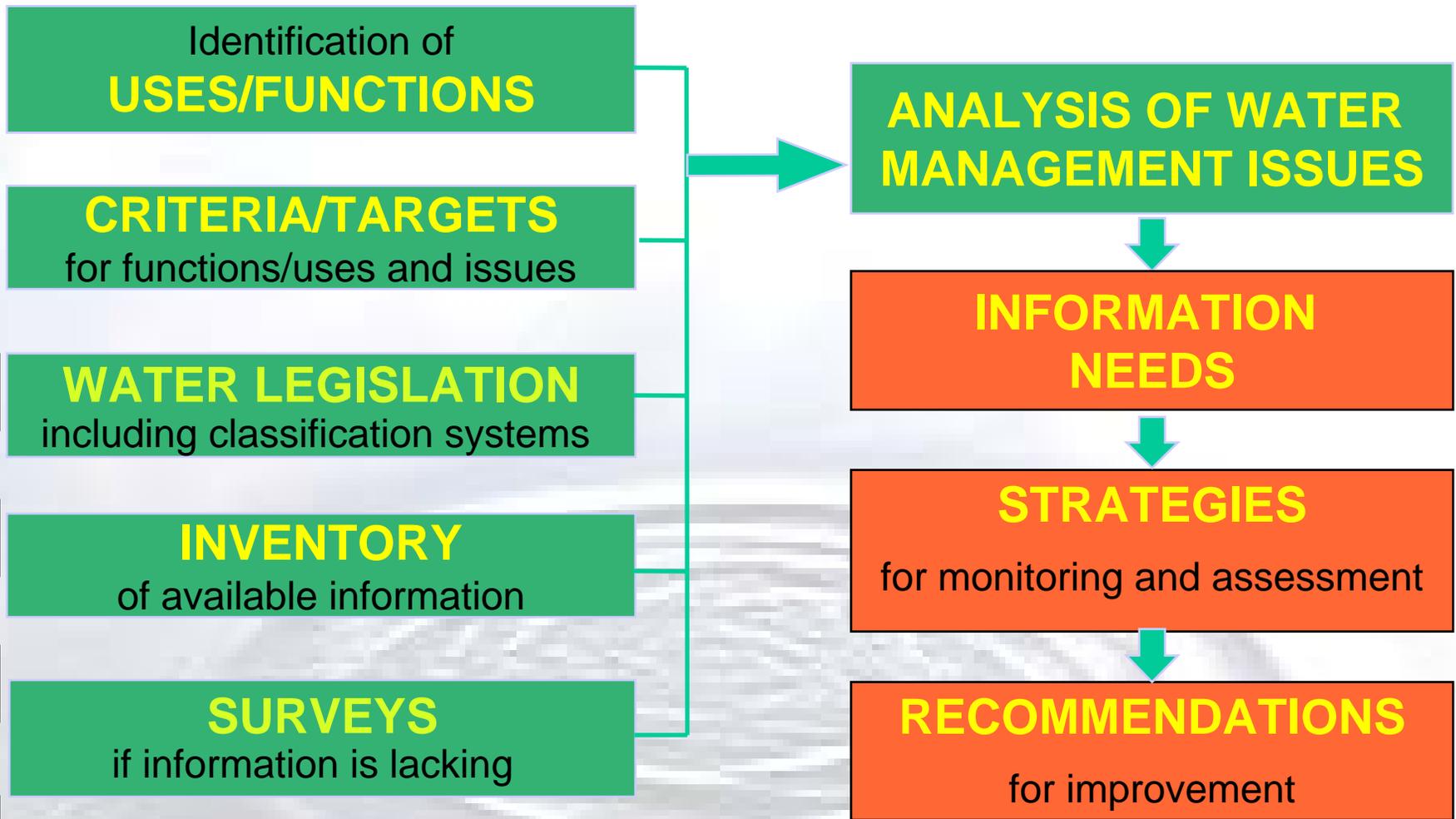
- Uses and functions:
 - Ecosystem functioning
 - Drinking water supply
 - Industrial use
 - Water for irrigation
 - Fishing
 - Recreation
 - Flood defence
 - Transport medium for waste water
 - Electric power production
- Different countries



Location of pilot projects



Steps in the river pilot projects



Water uses and issues in the Mures/Maros



Functions/uses \ Issue/problems	Drinking water	Ecosystem functioning	Fishing	Recreation	Irrigation	Industrial use
Organic pollution	X	X	X	X		
Bacterial pollution	X			X		
Eutrophication		X	X	X		
Pollution by hazardous substances	X	X	X	X	X	
Accidental pollution	X	X	X	X	X	X

high stress
 medium stress
 moderate stress



Analysis of water management issues



Management	Constraints
goals Secure drinking water supply for the future, both in quality and in quantity	Organic pollution can cause problems for drinking water supply
	Increased N or P concentrations cause eutrophication of some water sources and it requires higher water treatment costs for drinking water production
	Flooding occasionally threaten quality of water sources
	Occurrence of accidental pollution
	Bacteriological pollution
	Water scarcity in low water flow periods
	Low water levels may lead to increased concentration of pollutants

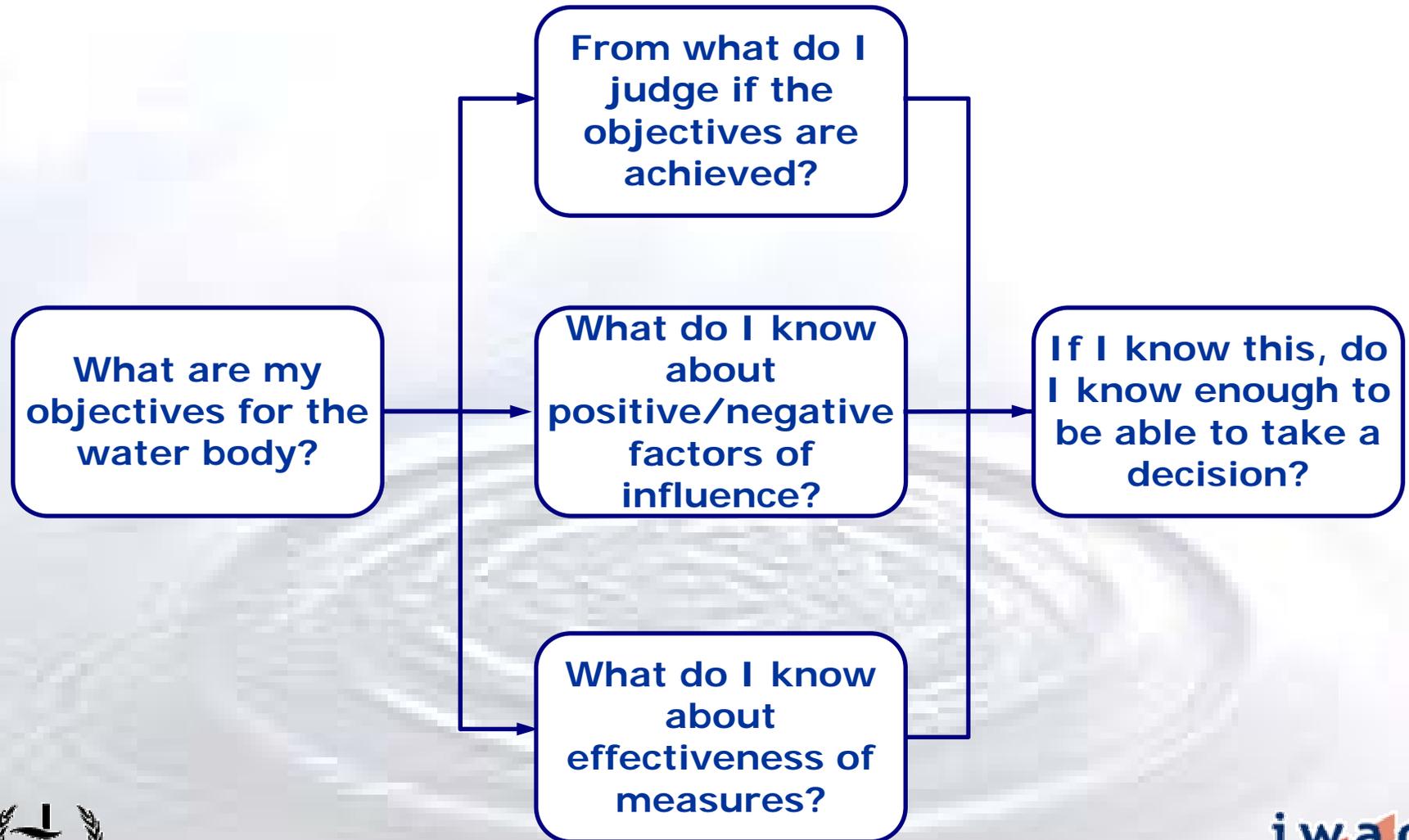


Essential questions

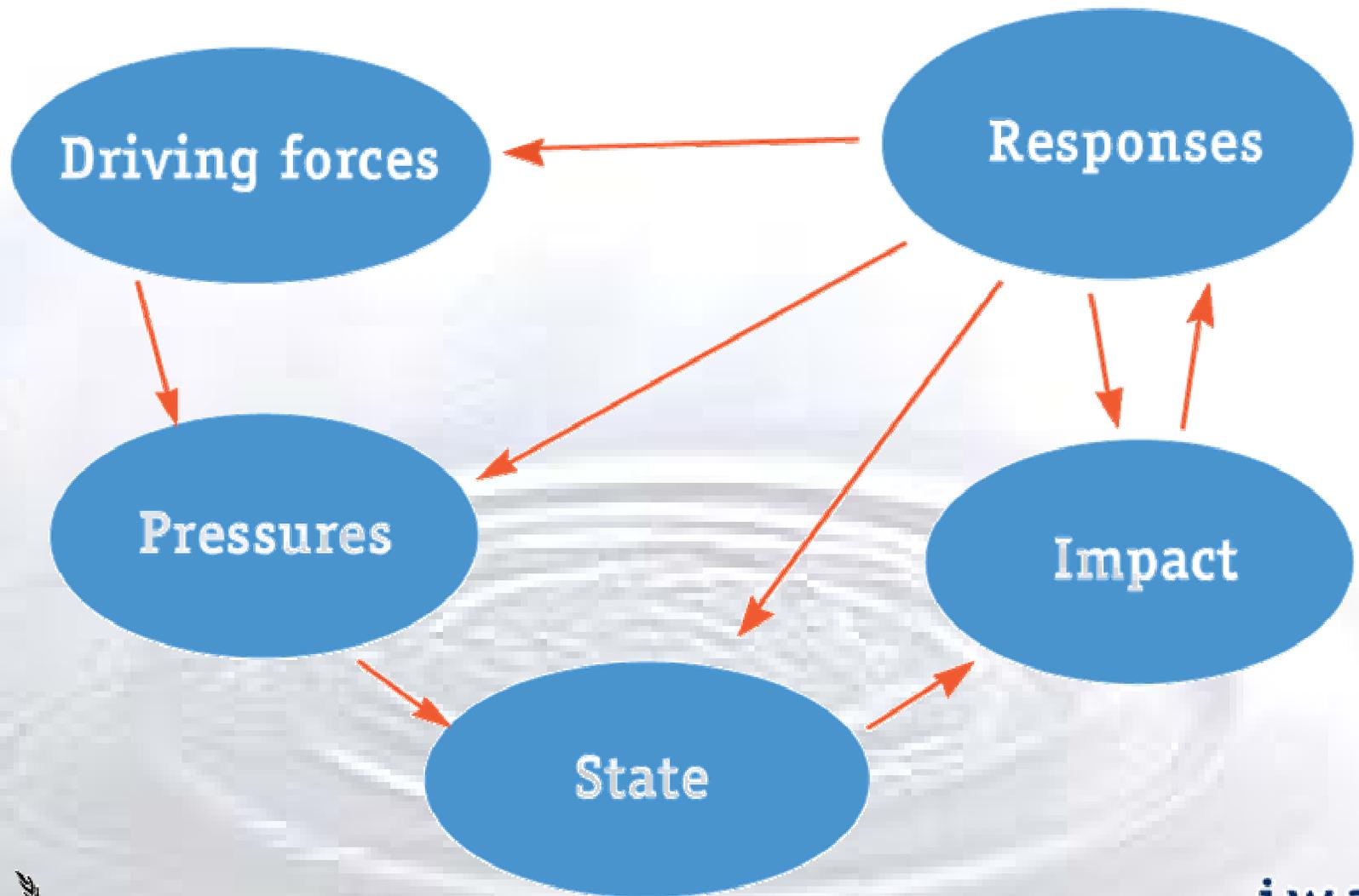
Starting question

Fill-in question

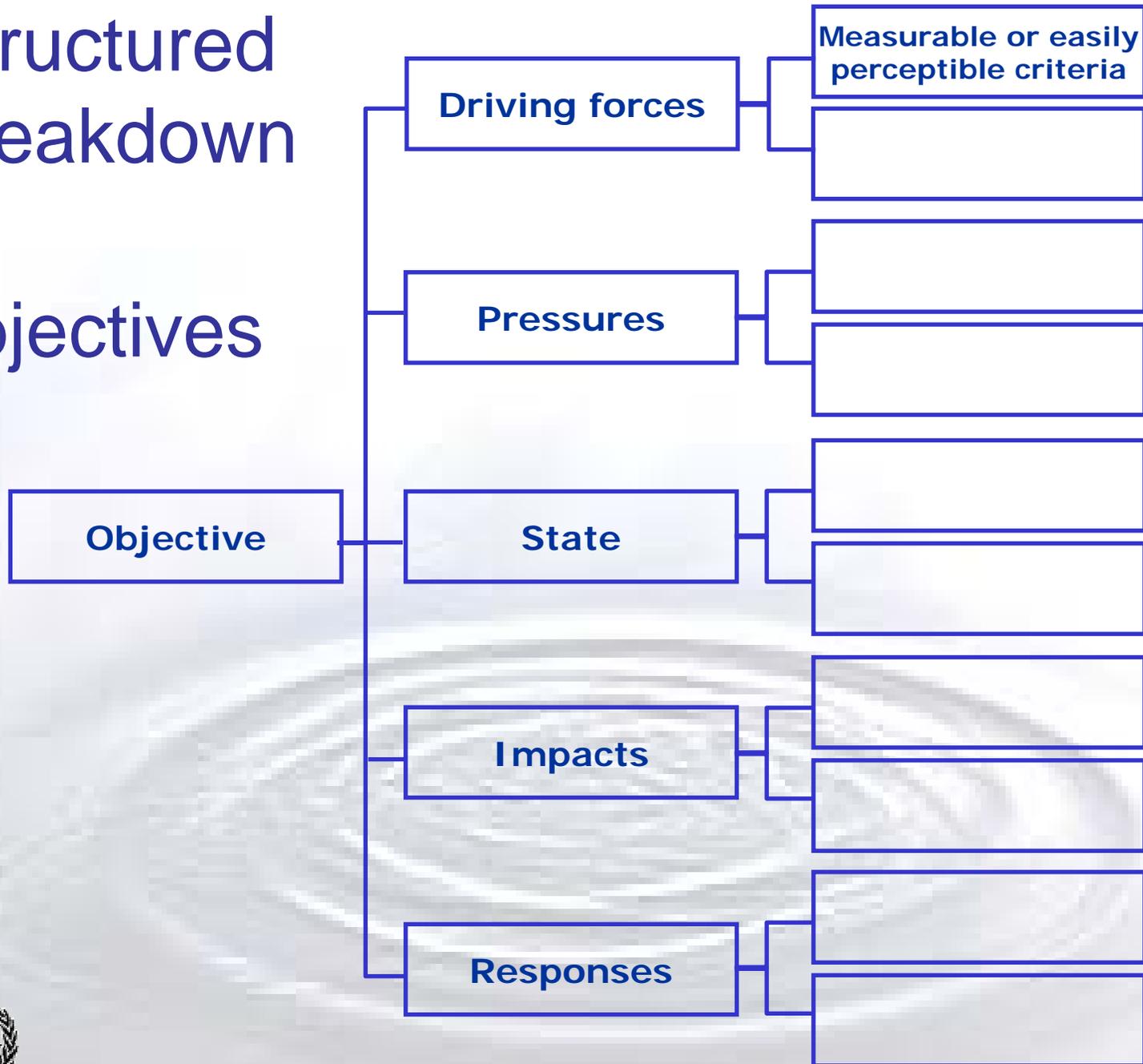
Verifying question



Cause-effect relationship



Structured breakdown of objectives



Information needs



Ecological functioning - Eutrophication

Driving force	Pressure	State	Impact	Response
<ul style="list-style-type: none"> •Number of individual households •Water consumption for municipal purposes 	<ul style="list-style-type: none"> •The load of P and N from WWTP's discharged into the river and its tributaries from point sources 	<ul style="list-style-type: none"> •Concentration of P and N in groundwater •Concentration of chlorophyll •Water consumption index per capita 	<ul style="list-style-type: none"> •Changes in performance of the ecosystem, decreasing number of species of flora and fauna •Algae blooming (blue-green algae, diatoms, green algae), including the algae toxic for the water fauna, for cattle and people 	<ul style="list-style-type: none"> •Construction of sewage systems and new sewage treatment plants •Costs of removing N and P from the sewage



Lessons for transboundary monitoring and assessment



Analysis of functions, issues and uses required project teams to:

- take a river basin approach where previous focus had been on water quality at the border
- think about the spatial distribution of functions and issues in relation to water management
- take account of possible groundwater – surface water interactions for both quantity and quality



Lessons for transboundary monitoring and assessment



Structured breakdown of objectives required project teams to:

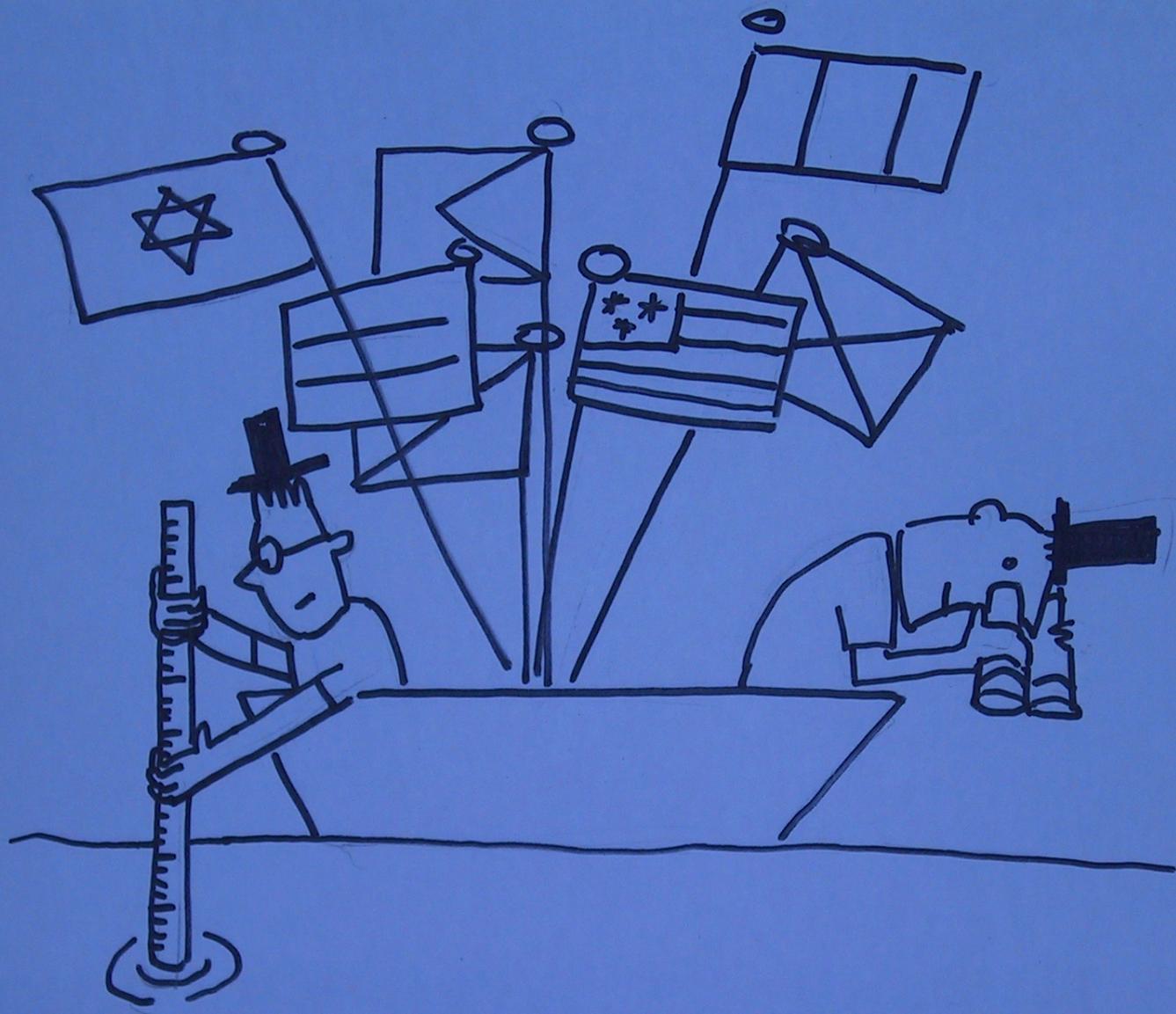
- think about the cause-effect chain where previous focus had been on status alone
- be aware of socio-economic factors next to the physico-chemical or ecological situation



Conclusion

The approach of a water management analysis combined with the structured breakdown of water management objectives supports and facilitates an integrated design of monitoring





MONITORING TOGETHER