



Ministry of Infrastructure and the  
Environment

# The main challenges in quantifying benefits

Rob van der Veeren



# Welcome to the Netherlands

40 000 km<sup>2</sup>

In total about 16 millions inhabitants

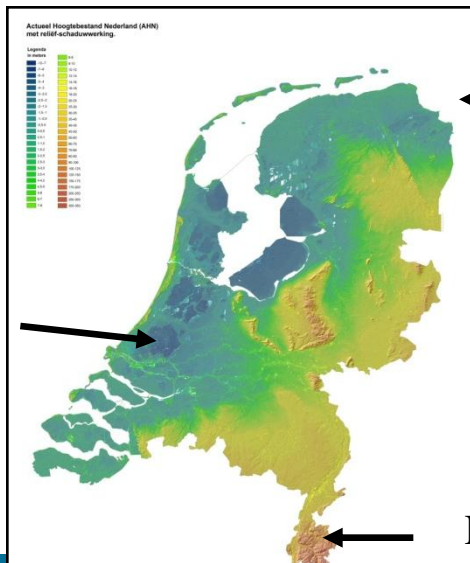
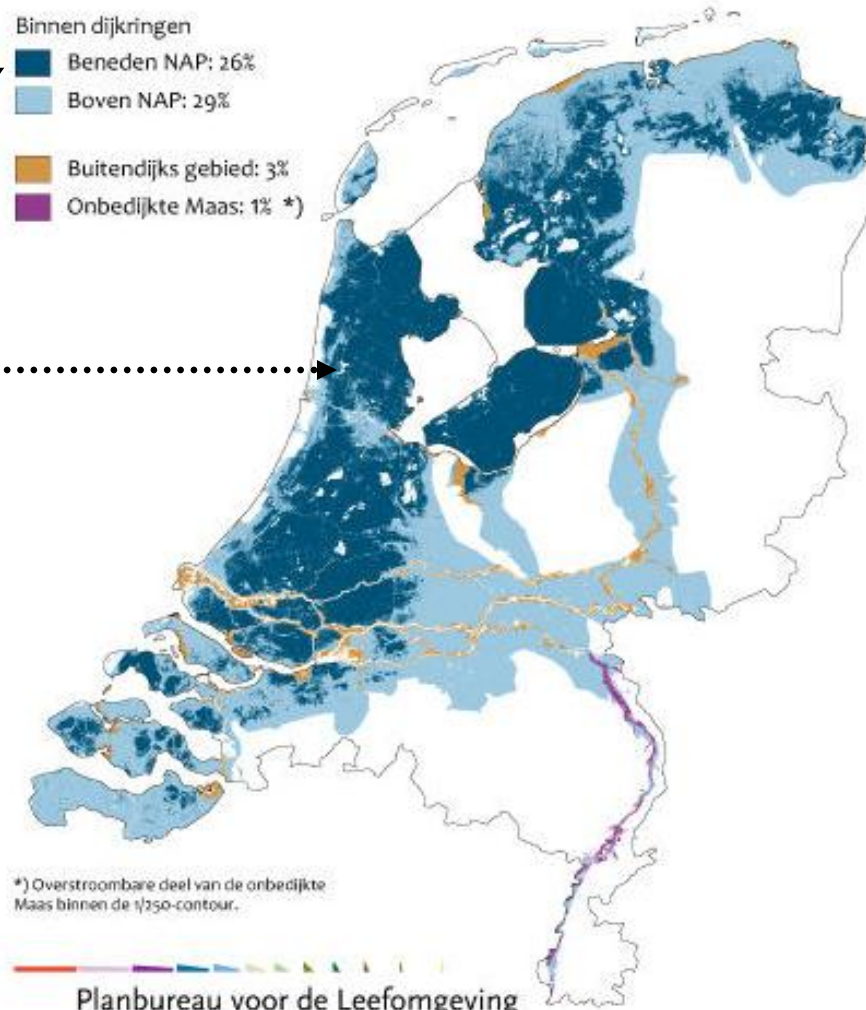
26 % is below sea level

About 55% is flood prone

(10 million inhabitants live there)

(2/3 of our GDP is generated there)

- Binnen dijkringen
  - Beneden NAP: 26%
  - Boven NAP: 29%
- Buitendijks gebied: 3%
- Onbedijkte Maas: 1% \*)



Altitude map

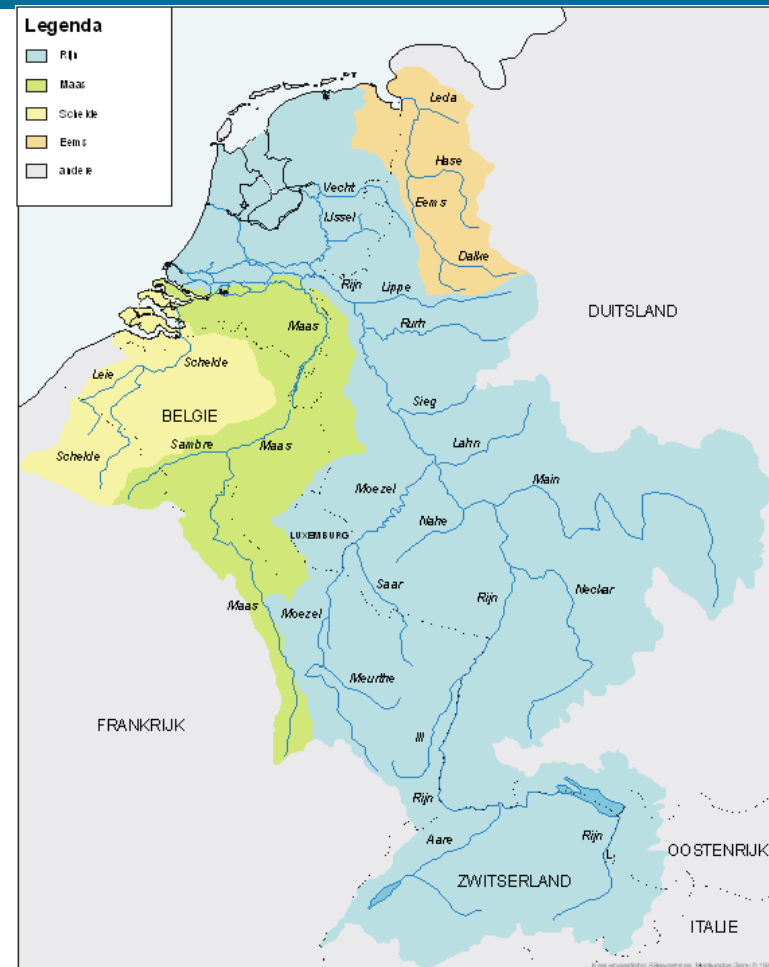
Lowest spot  
-7 m +  
MSL

Highest spot + **300** m + MSL



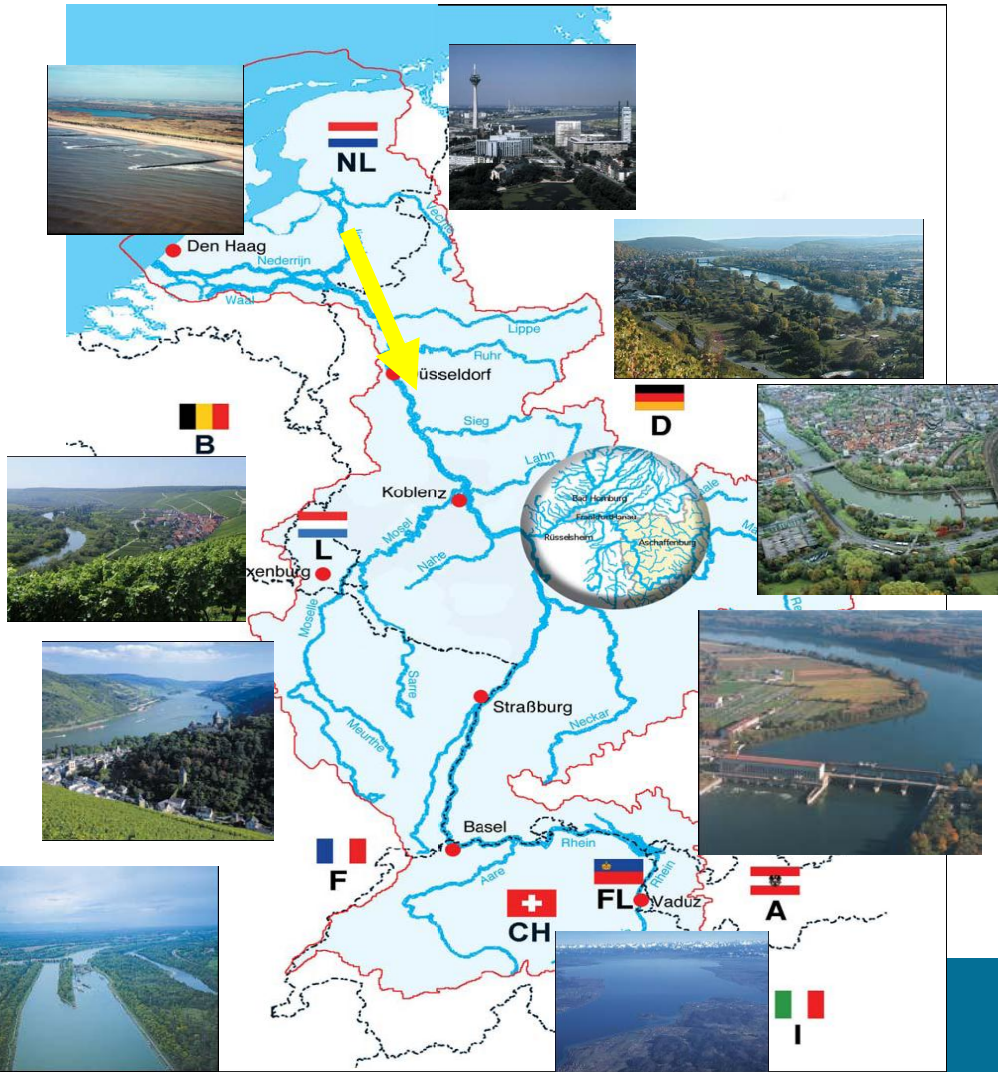
## Four international riverbasins

- Rhine
- Meuse
- Ems
- Scheldt
- International cooperation is key:
  - Water quantity
  - Water quality
  - Environment
  - Trade (Rotterdam!)
- International river basin commissions, regional sea convention, EU





# International cooperation in the Rhine basin



3rd European river after Volga and Danube

9 countries: Italy, Austria, Liechtenstein, Switzerland, France, Germany, Belgium, Luxemburg, The Netherlands

58 million inhabitants

Drinking water for 20 million people

Rijkswaterstaat

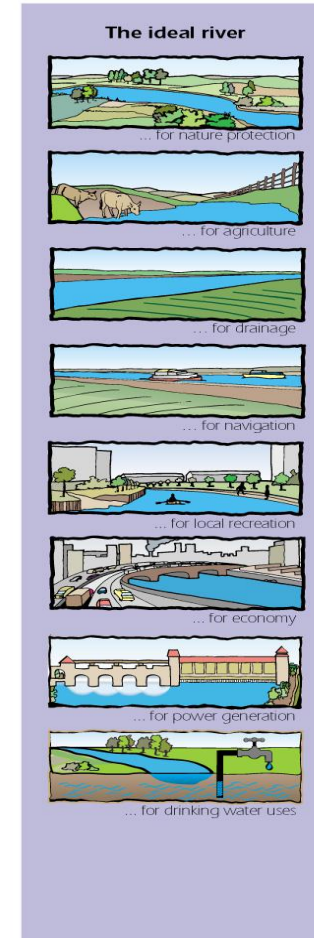
The main challenges in quantifying benefits



# Functions of the Rhine

## The ideal river...

- ... for nature protection
- ... for agriculture
- ... for drainage
- ... for navigation
- ... for local recreation
- ... for economy
- ... for power generation
- ... for drinking water uses

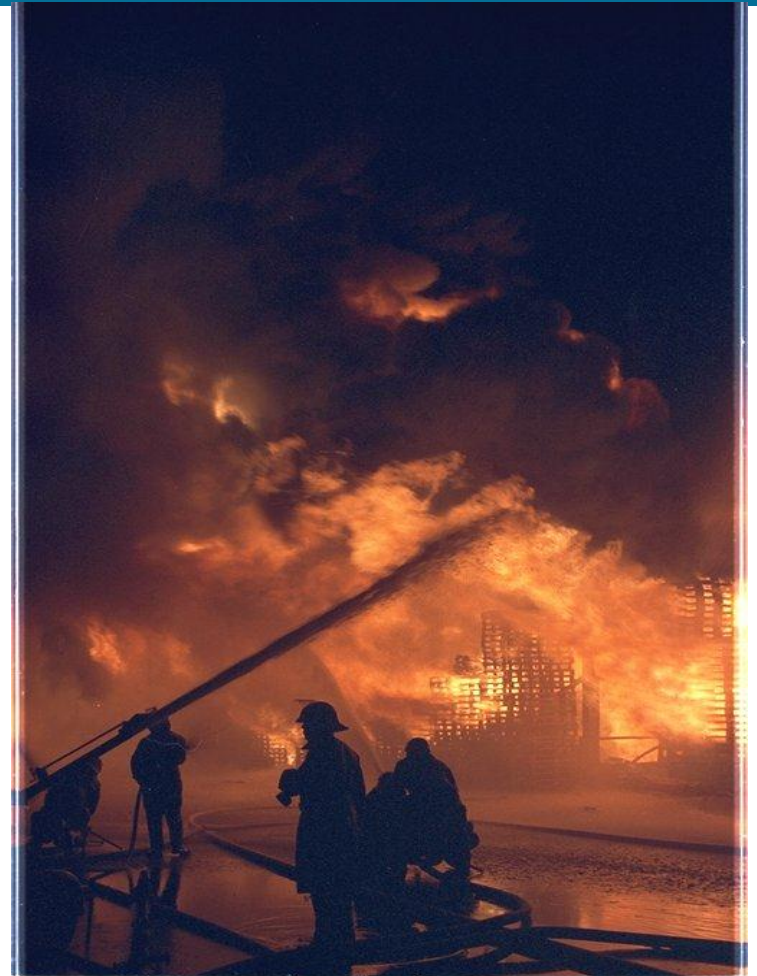




## Some important dates

- 1950 common forum for the Rhine.
- 1963 official agreement.
- 1976 EC becomes member and signing conventions against chemical pollution and chlorides
- 1986 Sandoz accident
- 1987 signing Rhine Action Program
- 1998 signing action plan on floods

([www.iksr.org](http://www.iksr.org))



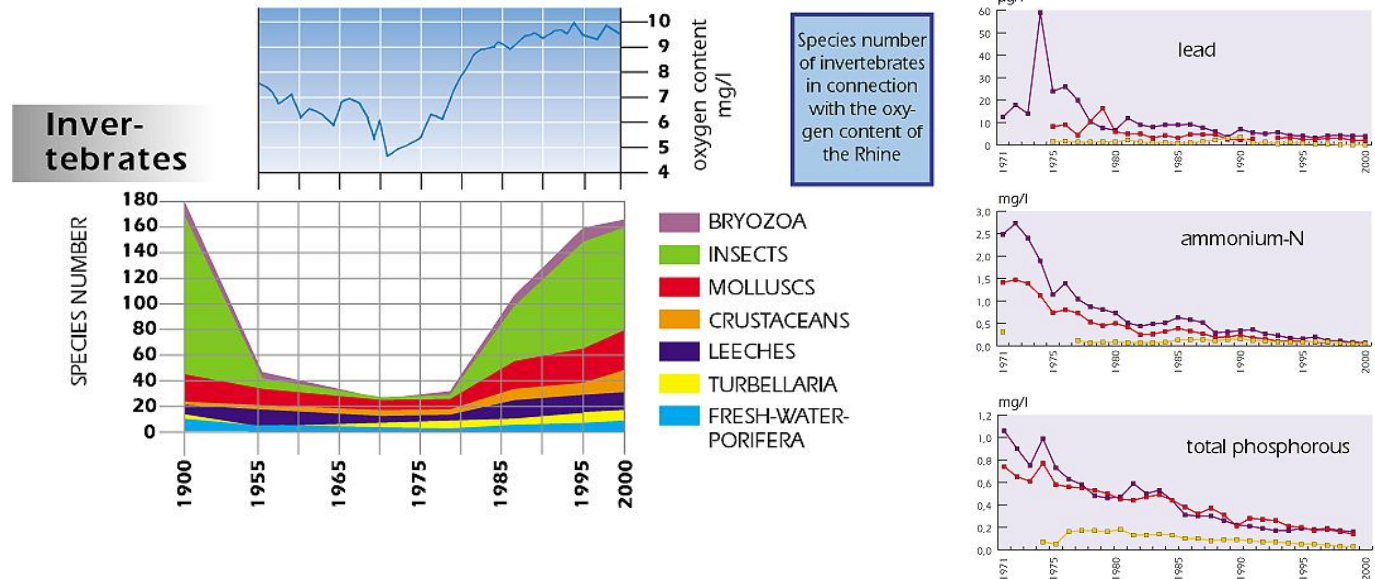
1986: Fire at Sandoz, Schweizerhalle (CH)



# International cooperation in the Rhine basin

- Cooperation to harmonize the many interests of use and protection in the area. Focal points of work are sustainable development of the Rhine, its alluvial areas and the good state of all waters in the watershed.

- Results of the Rhine Action Program



- Cooperation in the Rhine as example for European legislation. E.g. 2000 European Water Framework Directive, 2007 Floods Directive



## What determines successful cooperation?

- Commonly shared river basin
- Combined transboundary activities (e.g. shipping, hydropower, safety)
- Commonly recognised problems to be solved, resulting in shared responsibility (loads to North Sea are common responsibility)
- Commonly agreed objectives
  - Set realistic achievable targets (small steps on a longer path)
- Common targets require common actions
  - Not substance by substance, but best available techniques for various activities





## What determines successful cooperation?

- Each member state responsible to implement their own measures
  - based on and using existing national approaches, thus respect national differences
  - Common agreement on targets, not on measures
  - Own financing/budgets
  - Respect subsidiarity and proportionality
- Reporting to European Commission on e.g. Water Framework Directive in 2 parts:
  - 1 Part A: Elements of international importance
  - 9 Parts B: Elements of regional importance



## What determines successful cooperation?

- Open atmosphere: discuss, decide, implement and monitor
  - Agreed monitoring programs and progress reports -> Peer pressure
- There should be something in there for everyone
  - either interests, or a common enemy
- Positive attitude participants: common interest to do something
- Support by an active secretariat
- Culture?
- Communicate actions and share successes
  - Salmon back in to the Rhine
- But most important: People willing to cooperate

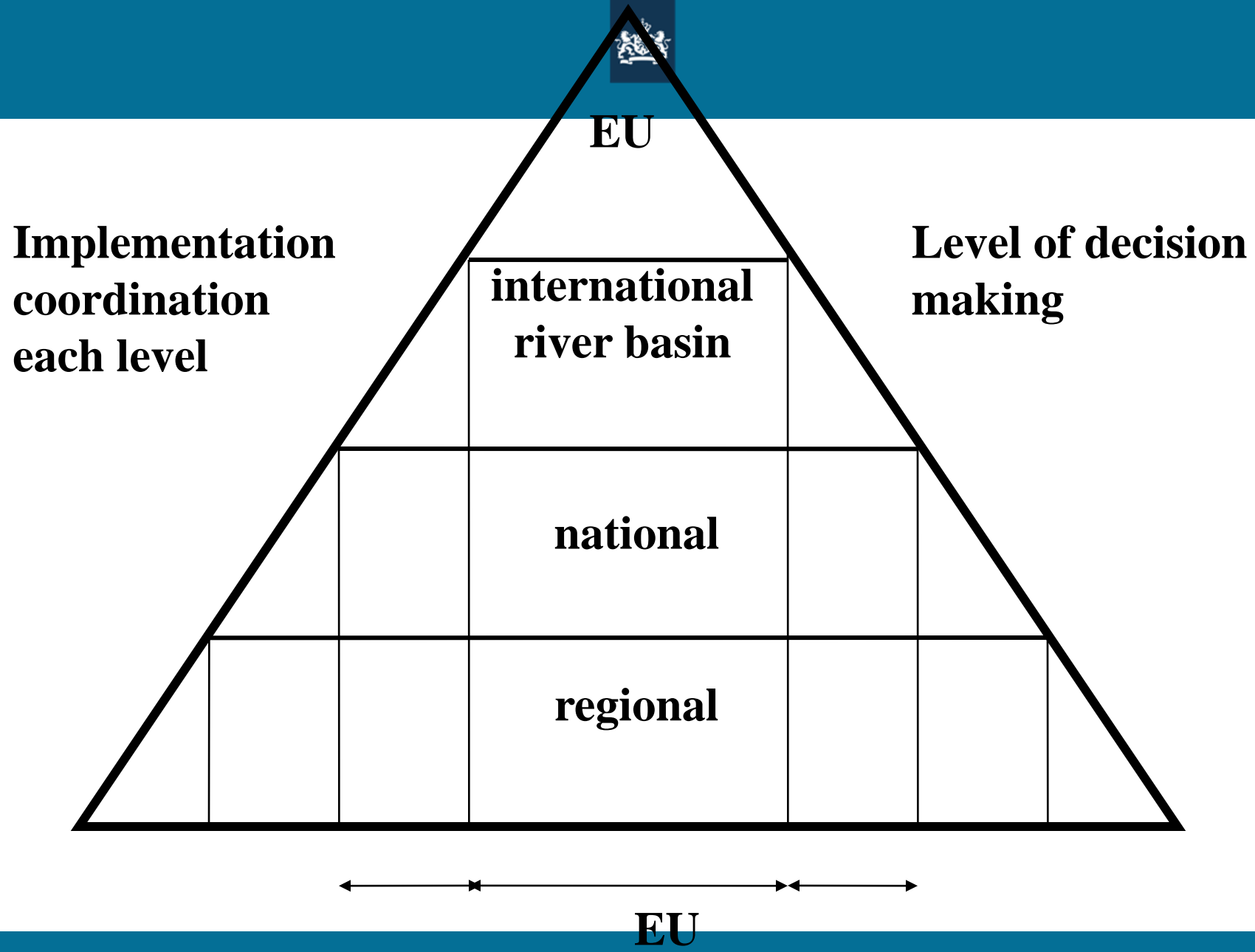


ICPR secretariat,  
Koblenz



## International cooperation irt EU directives

- European Water Framework Directive, European Flood Directive, European Marine Strategy Framework Directive together form legal basis for European water management
- Covers all water management issues
- Directives require international coordination and cooperation
- International river commissions (and regional sea convention) are ideal platform for international coordination
- Benefit of many years of experience
- But respect subsidiarity and proportionality...





## International cooperation irt EU directives

- Tried to estimate cost recovery rate for water services across Germany and NL
  - But institutional set up is completely different
  - Numbers look similar but mean totally different things
  - We agree on the goals, means can be different
- Largest value added of work on European guidance documents (but also international cooperation in general):
  - building an international network,
    - reduces the feeling you are the only one working on this issue; help from a peer is just a phonecall away
  - understanding differences and (common) interests
- Cost savings by performing joint research?

## The main challenges in quantifying benefits

- I am convinced of the benefits presented in the previous slides. But how to quantify them? I would not know, but important to stress in times of budget cuts.
- May be using game theory?
  - E.g. 'Game theoretic analyses of nitrate emission reduction strategies in the Rhine river basin' (van der Veeren and Tol): Int. J. of Global Environmental Issues, 2003 Vol.3, No.1, pp.74-103
- Remainder of the presentation will be on the challenges in quantifying environmental benefits...





## Lessons learned from Water Framework Directive

- Often effects of measures are not clear
- Often no idea at all on quantitative impacts on the environment
- Often willingness to pay numbers are not available
- Often willingness to pay numbers in other studies are not reliable (e.g. based on very limited population size; socially acceptable answers, and so on)
- Often willingness to pay numbers from other studies are not suited for the problem at hand
- Often the size of impacted population can not be determined
- For environmental measures costs usually outweigh benefits (don't trust people telling the opposite!)

## Lessons learned from Water Framework Directive

- Expert judgement and assumptions will bring you a long way.
- But...
- Be careful using too much assumptions: If you completely lack real life data you might end up with a nice scientific paper, instead of a policy relevant story
- In university we focus on theory and assume the practical world behaves accordingly. In policy it is the other way around.







Good ecological quality  
(EQR 0.6-0.8)

Characteristics are a large variety in open and shaded places, deep and shallow, sand and stones etc.



Insufficient ecological quality (EQR 0.2-0.4)

Some small rivers are functional canals without variation in morphological structure



Poor ecological quality  
(EQR 0.4-0.6)

Only one river bank has a natural morphology, the required species are available, but in too small numbers



Bad ecological quality (EQR < 0.2)

Bad water quality; animals can barely survive

Remember:

We have a story to tell



## Lessons learned from Water Framework Directive

- In case you are not certain about the exact size of the problem, but you know you have a problem, start by implementing some cheap effective measures and let increased knowledge base tell you whether you need to do more: E.g. real option analysis



## Ecosystem services: The new kid on the block...

- Various people and institutions assume that presenting impacts of measures in terms of ecosystem goods and services, will make environmental measures more beneficial
- But
- Often policy makers assume that 'benefits' can be used to cover the costs of the measures. But benefits are not a source of finance -> Virtual money; the problem with financing still remains
- Impacts of measures on ecosystem goods and services are often hard to quantify. In those cases, don't monetise
- Often better to have a good qualitative story than a bad quantitative one
- The concept of ecosystem services may be helpful to not forget certain benefits and even think of alternative solutions



**If you have any questions,**



**you know where you can find me...**

**[rob.vander.veeren@rws.nl](mailto:rob.vander.veeren@rws.nl)**