Welcome to part I of the

Practical training course on sustainable sediment management with the Sava River Basin as a showcase

Four Points by Sheraton Panorama Hotel
Zagreb, 15 – 18 October 2012

Introduction to the course

Jos Brils, Deltares
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Deltares
Enabling Delta Life

Part I of the practical training course on sustainable sediment management with the Sava River Basin as a showcase. Zagreb, 15 – 18 October 2012

International Sediment Initiative · UNESCO · INTERNATIONAL SAVA RIVER BASIN COMMISSION · Venice Office · brgm Geoscience for a sustainable Earth · Hochschule für Angewandte Wissenschaften Hamburg · Hamburg University of Applied Sciences · Vmm VLAAMSE MILIEUMAATSCHAPPIJ · Deltares Enabling Delta Life · SedNet

Course enabled by

UNESCO International Sediment Initiative (ISI)

European Sediment Network (SedNet)

initiators of the course

International Sava River Basin Commission (ISRBC)

UNESCO Venice Office

German IHP/HWRP Secretariat

HAW

BRGM

VMM

Deltares

a great
"thank you"
to them

International Sediment Initiative - ISI

Objectives:

Through international cooperation in the area of erosion and sediment management, ISI aims to:

- Strengthen, at global level, awareness about the importance of erosion and sediment processes and their impacts
- Promote exchange of information on relevant data, monitoring and management methods, including the use of global environmental observation systems
- Foster cooperation in erosion and sediment-related research and education

ISI at a glance:

- launched by UNESCO's IHP in 2004
- secretariat at International Research and Training Centre on Erosion and Sedimentation (IRTCES), Beijing, China

Website: http://www.irtces.org/isi/info.asp

European Sediment Network - SedNet

Mission:

A European network aimed at incorporating sediment issues and knowledge into European strategies to support the achievement of a good environmental status and to develop new tools for sediment management.

Contribute to the further development of a holistic understanding of sediments and their management.

Identity:

- Network of sediment professionals
- Independent platform to expert advice
- Positioned between science and stakeholders
- Window on sediment issues to EC DG Environment

Focus:

- Sediment quality AND quantity issues
- River basin scale
- Including marine / estuarine sediments in a ICZM context

Website: www.sednet.org

Course objective for part I & II

At conclusion of course the participants should deliver:

1. draft practical guidance how to achieve SSM plan for the Sava River Basin;
2. initial results application part I guidance in the Sava River Basin;
3. draft implementing program for development of the Sava SSM Plan;
4. draft project fiches for different modules of the Sava SSM Plan.

Course objective for part I

1. draft part I guidance how to achieve SSM plan for the Sava River Basin
2. draft implementing program for development of this Plan
3. identify projects needed to develop different modules of this Plan

Course scope

Following the art. 4, par. 3 of the ISRBC “Protocol on Sediment Management (SM):

a) sediment balance throughout the river system;

b) sediment monitoring;

c) evaluation of sediment quality and quantity;

d) measures to prevent impacts and pollution of water or sediment resulting from dredging;

e) measures to control erosion, torrents and other sediment processes;

f) measures to ensure and maintain integrity of water regime;

g) measures to provide, ensure and maintain conditions for safe navigation;

h) measures to protect wetlands areas and retention spaces;

i) measures to control reservoir sedimentation;

j) designated areas for capital dredging;

k) guidance for sediment disposal, treatment and use

l) institutional arrangements for implementation of the SM Plan.

Course scope

Following the art. 4, par. 3 of the ISRBC “Protocol on Sediment Management (SM):

Part I

a) sediment balance throughout the river system;
b) sediment monitoring;
c) evaluation of sediment quality and quantity;

Part II

d) measures to prevent impacts and pollution of water or sediment resulting from dredging;
e) measures to control erosion, torrents and other sediment processes;
f) measures to ensure and maintain integrity of water regime;
g) measures to provide, ensure and maintain conditions for safe navigation;
h) measures to protect wetlands areas and retention spaces;
i) measures to control reservoir sedimentation;
j) designated areas for capital dredging;
k) guidance for sediment disposal, treatment and use
l) institutional arrangements for implementation of the SM Plan.

Course participants

YOU:

- local experts from the Sava Basin
- involved in its sediment management
- are asked to transfer your learning experiences into draft practical guidance on how to achieve a SSM plan

WE

also want to learn, so
please fill out evaluation form

Your teachers / experts

1 
Jos Brils
Deltares
The Netherlands

2 
Rollin Hotchkiss
Brigham Young University
United States of America

3 
Suzanne Heise
Hamburg University of Applied Sciences
Germany

4 
Philippe Negrel
BRGM
France

5 
Erik Mosselman
Deltares
The Netherlands

6 
Alan Covich
University of Georgia
United States of America

7 
Ward De Cooman
Flemish Environment Agency (VMM)
Belgium

8 
Matjaz Mikos
University of Ljubljana
Slovenia

9 
Damir Bekic
University of Zagreb
Croatia


Dijana Oskorus
Meteorological and Hydrological Service
Croatia

10 
Tarik Kupusovic
Hydro-Engineering Institute Sarajevo
Bosnia & Herzegovina

?
Zoran Lazic
Water Agency for Sava district
Bosnia & Herzegovina / Republic Srpska

11 
Marina Babic Mladenovic
Institute Jaroslav Cerni
Serbia

12 
Adriaan Slob
TNO
The Netherlands

Course outline

Time	Session	Expert		#	
		#	Name	sessions	hours
Day 1 – Monday 15 October 2012: start 14.00 – end 17.45 h					
14.00	- Welcome address: ISRBC & UNESCO - Introducing each other to each other	-	Komatina & Pypaert	1/3	0.50
14.30	Introduction to the course	1	Brils	1/6	0.25
14.45	Sediment quality – Ecotoxicology	3	Heise	1	1.50
16.15	*Tea*				
16.45	Introduction lecture	1	Brils	1/3	0.50
17.15	Expectations of the course participants	1 12	Brils & Slob	1/3	0.50
Day 2 – Tuesday 16 October 2012: start 09.00 – end 17.30 h					
09.00	Engineered river systems	5	Mosselman	1	1.50
10.30	*Coffee*				
11.00	Engineered river systems (continued)	5	Mosselman	1/2	0.75
11.45	Ecosystem functioning & biodiversity – Ecotoxicology	7	De Cooman	1/2	0.75
12.30	*Lunch*				
14.00	Ecosystem functioning & biodiversity – Ecology	6	Covich	1	1.50
15.30	*Tea*				
16.00	Sediment quality – Geochemistry / environmental chemistry	4	Negrel	1	1.50

"theory"

Sava "practice"

Course outline

Time	Session	Expert		#	
		#	Name	sessions	hours
Day 3 – Wednesday 17 October 2012: start 09.00 – end 17.30 h					
09.00	Sediment budget at a basin scale (including hydrology)	2	Hotchkiss	1	1.50
10.30	*Coffee*				
11.00	Sediment budget at a basin scale (including hydrology)(continued)	2	Hotchkiss	1	1.50
12.30	*Lunch*				
14.00	Sediment status Slovenia	8	Mikoš	1/2	0.75
14.45	Key-issues Slovenia	12	Slob	1/2	0.75
15.30	*Tea*				
16.00	Sediment status Croatia	9	Bekić & Oskoruš	1/2	0.75
16.45	Key-issues Croatia	12	Slob	1/2	0.75
Day 4 – Thursday 18 October 2012: start 09.00 – end 17.30 h					
09.00	Sediment status Bosnia & Herzegovina	10	Kupusović & Lazić	1/2	0.75
09.45	Key-issues Bosnia & Herzegovina	12	Slob	1/2	0.75
10.30	*Coffee*				
11.00	Sediment status Serbia	11	Babic	1/2	0.75
11.45	Key-issues Serbia	12	Slob	1/2	0.75
12.30	*Lunch*				
14.00	Drafting part I guidance for Sava SSM Plan	12	Slob	1	1.50
15.30	*Tea*				
16.00	Drafting part I guidance for Sava SSM Plan (continued)	12	Slob	5/6	1.25
17.15	Closing remarks & farewell	-	Komatina, Pypaert, Brils	1/6	0.25

"theory"

Sava "practice"

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Introduction into sustainable sediment management

Jos Brils, Deltares
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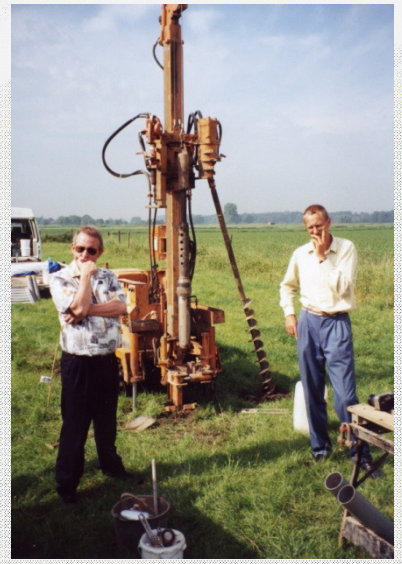
Outline

- Perspective on sediment
- Sustainable sediment management (SSM)
  - Possible definitions of S, S and M
  - SSM key messages: ISI, SedNet and Framework Agreement on the Sava River Basin (FASRB)
- Sediment management 2.0

Perception of sediment

Invisible

Toxic



Difficult

Waste

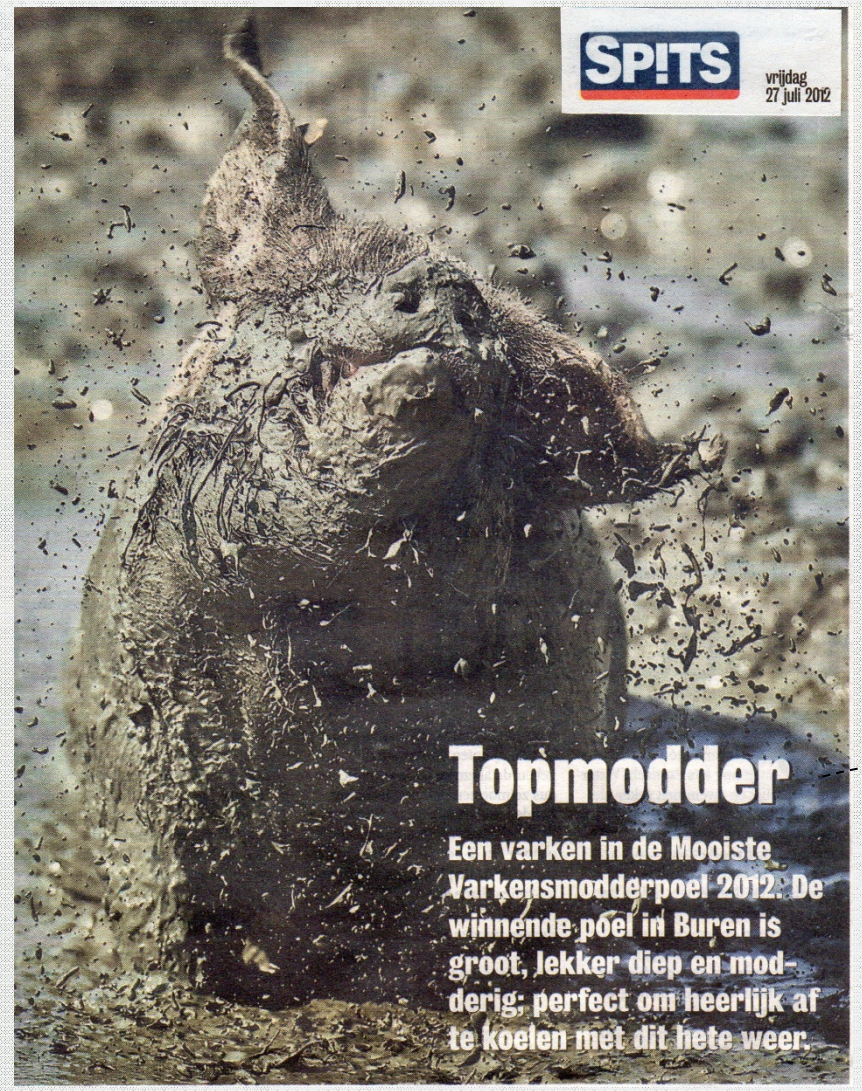
Nimby

Source: Hakstege, SedNet conference 2004

But perceptions change …

Photo: Bert Satijn, RISKBASE conference 2008

A true expert's perspective …

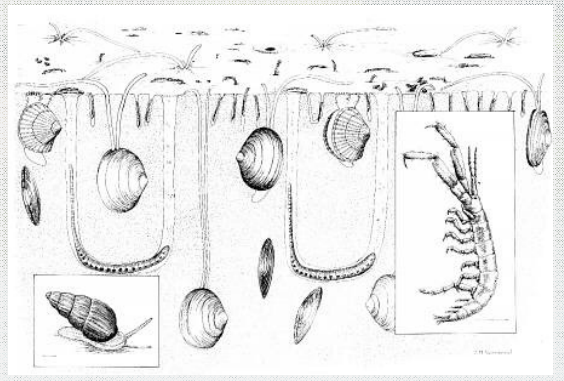


"Top sediment"

"A pig in the most beautiful 2012 sediment pit. The winning pit in Buren is big, pleasantly deep and muddy: perfect for cooling down on a hot day, like today."

SedNet perspective on sediment

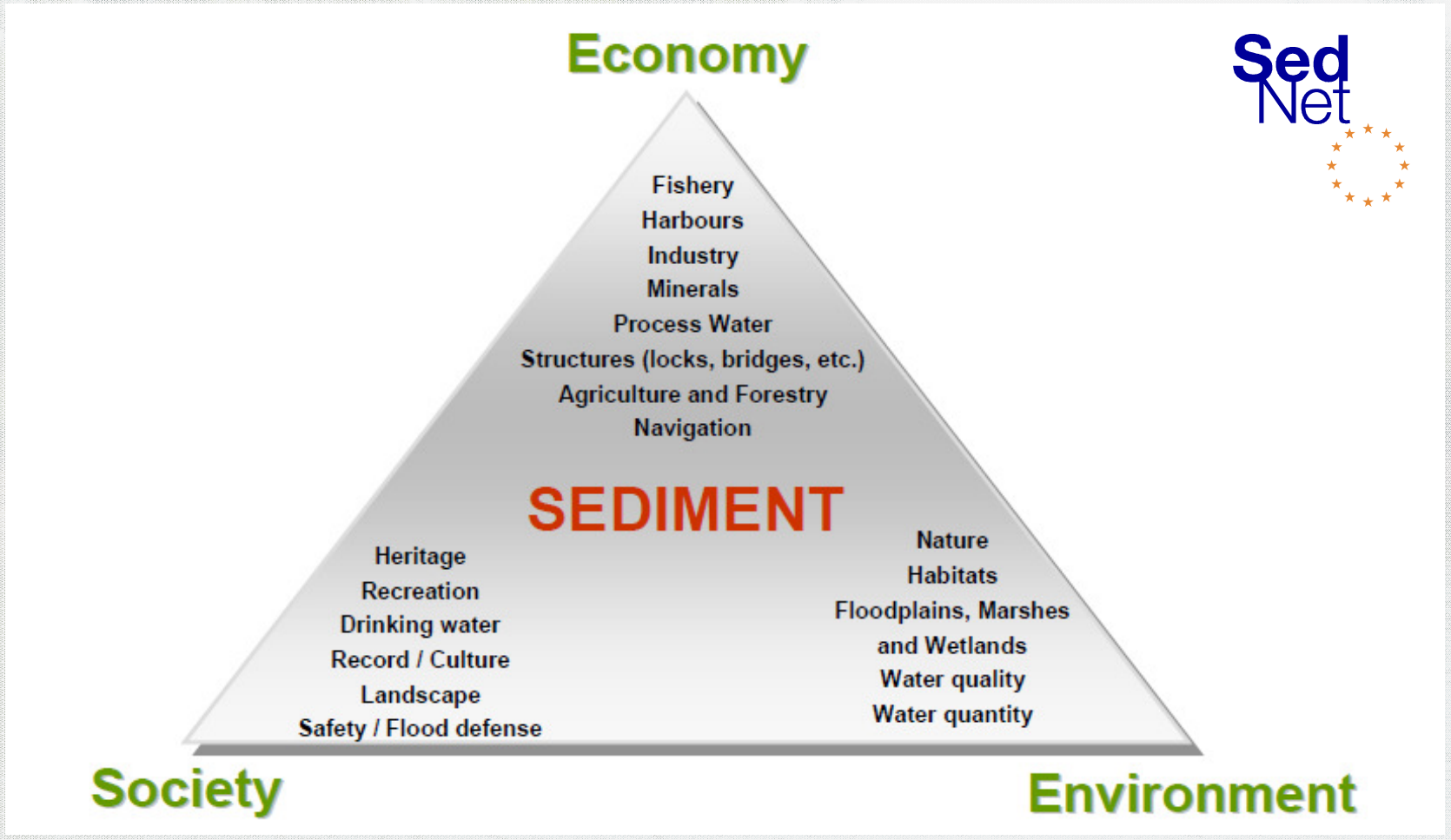
Too much sediment	Too little sediment	Sediment as resource
Obstruction of channels Rivers fill and flood Reefs get smothered Turbidity	Beaches erode Riverbanks erode Wetlands are lost River profile degradation	Construction material Sand for beaches Wetland nourishment Soil enrichment Habitat and food for life



Sediment = not a waste =
essential and integral part of our river basins

Source: Martin, 2002

The three values and sediment functions



Source: Brils (Eds.), 2004. The SedNet Strategy Paper - The opinion of SedNet on environmentally, socially and economically viable sediment management

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Possible definitions S, S and M

Sustainable:	The use of sediment, balancing the social, economical and environmental values, with full attention to adverse effects, so as to enhance the utility of river basins in the future
Sediment:	Suspended or deposited solids, of mineral as well as organic nature, acting as a main component of a matrix, which has been, or is susceptible to being transported by water*
Management:	A set of continuous interventions in order to achieve sustainability**

* In the view of SedNet, sediment and suspended solids are the same in terms of SSM.

** It should be emphasized that management of sediment is inextricable connected the management of soil/water system.

Source: Brils (Eds.), 2004. The SedNet Strategy Paper - The opinion of SedNet on environmentally, socially and economically viable sediment management

ISI key messages related to SSM

- Global change involves more than climate change
- Important changes to the earth's surface occur as result of population growth, land clearance and land use change, infrastructure development and resource exploitation
- Changing erosion and sediment dynamics have wide-ranging implications for food production food security, water resource development and terrestrial and aquatic ecosystems
- Need for improved sediment management in river basins, and resulting need for capacity building and improved education in the sediment field
- Need for improved sediment monitoring programmes
- Need for improved predictive capabilities for erosion and sediment dynamics

Source: Walling, 2009. The Impact of Global Change on Erosion and Sediment Transport by Rivers: Current Progress and Future Challenges. UNESCO publication

SedNet key messages related to SSM

SSM is finding solutions:

- in the context of the whole river system
- carefully balancing environmental and socio-economical values
- in increased interaction with stakeholders
- embracing the whole soil-water system (integrated solutions)
- respecting natural processes and functioning
- not resulting in up-/downstream impacts, not now or in the future

Source: Salomons & Brils (Eds.), 2004. Contaminated Sediments in European River Basins.

FASRB key messages related to SSM

Part II
Sediment Management

Article 3
Principles of sustainable sediment management

The Parties shall cooperate in order to achieve sustainable sediment management in the Sava River Basin by:

(a) Respecting the natural processes;
(b) Respecting the water regime;
(c) Recognizing the sediment, considering its quality and quantity, as resource;
(d) Providing the balance between *socio-economical* and *environmental* values of sediment;
(e) Planning and executing measures to reduce up- or downstream impacts;
(f) Providing the integrated river-sediment-soil-groundwater solutions;
(g) Supporting and increasing the cooperation with stakeholders.

Source: Protocol on Sediment Management to the Framework on the Sava River Basin - draft

Conclusion

TOWARDS SUSTAINABLE SEDIMENT MANAGEMENT IN THE SAVA RIVER BASIN

One of the essential parts of the river system is sediment, which forms a variety of habitats and environments. Nevertheless, its important role has been somehow forgotten many times. Consequently, there are as yet no examples of the fully-fledged integration of sediment management into river basin management. This was a key driver for UNESCO's International Hydrological Programme (IHP) to establish the global International Sediment Initiative (ISI), and to – independent of, and complementary to, ISI – establish the European Sediment Network (SedNet). Both ISI and SedNet promote and provide ample arguments for sustainable sediment management (SSM).

On the other hand, within the implementation of the *Framework Agreement on the Sava River Basin* (*FASRB*), the Sava countries have drafted the *Protocol on Sediment Management to the FASRB*, which will provide a legal basis for future cooperation of the countries on the development of the *Sediment Management Plan for the Sava River Basin* (*Sava SM Plan*). The *Protocol* highlights comparable guiding principles to SSM as those endorsed by ISI and SedNet.

These 'shared' principles set an excellent condition for cooperation among the Sava countries that will implement the *Protocol*, and ISI and SedNet to support that implementation through the project entitled *Towards Practical Guidance for Sustainable Sediment Management using the Sava River as a Showcase*. The project will bring together the state-of-the-art in scientific as well as practical knowledge on SSM and make that knowledge available through a practical training course. Therefore, the ISRBC, ISI and SedNet teamed up to jointly look for funding to develop the course and to apply the practical SSM guidance – as trained in the course – in the Sava river basin as a showcase. It is expected that such an experience will inspire other river basins (globally) to apply the SSM guidance, as well.

A sponsorship has been kindly offered by IHP-Germany, SedNet, ISI, UNESCO Venice Office,

BRGM and Deltares, while the ISRBC offered an in kind support by assisting in the organization and execution of the planned activities. This combined offer covers the first two steps of the project. Thus, it was decided to start with the implementation in April 2012.

The first step includes the development and execution of the first part of the SSM course, as well as the drafting of the corresponding guidance document. It will address the sediment balance throughout the river system, sediment monitoring and sediment quality and quantity evaluation, i.e.

the first three elements of a SM plan, as foreseen by the *Protocol*. In the course, planned to be held in October 2012, experts assigned by ISI and SedNet will train the state-of-the-art related to these issues, while the participants – local experts from the Sava river basin, involved in sediment management – will transfer their learning experiences into the draft practical guidance. In the second step, starting just after the course, the local experts will apply that draft guidance to elaborate the first elements of the *Sava SM Plan*, under the coordination of the ISRBC.

All the parties involved are optimistic to find the remaining funding needed to develop the second part of the project, which will address measures, dredging, sediment disposal, treatment and use, as well as institutional arrangements, and then again apply the lessons learned in the Sava practice to facilitate further development of the *Sava SM Plan*.

***Jos Brils**, Deltares, SedNet Steering Group*

***Anil Mishra**, UNESCO Paris, International Sediment Initiative*

***Dr. Dejan Komatina**, Secretary, Secretariat of the ISRBC*

"The Protocol highlights comparable guiding principles to SSM as those endorsed by ISI and SedNet.

These 'shared' principles set an excellent condition for cooperation among the Sava countries that will implement the Protocol, and ISI and SedNet to support that implementation"

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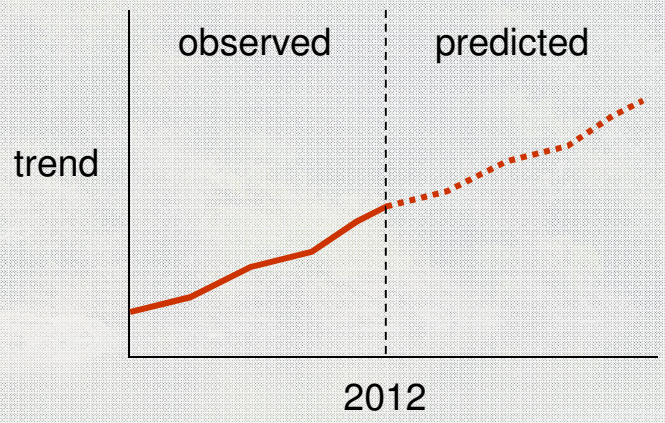
Sediment management 2.0

Vision based on:

no

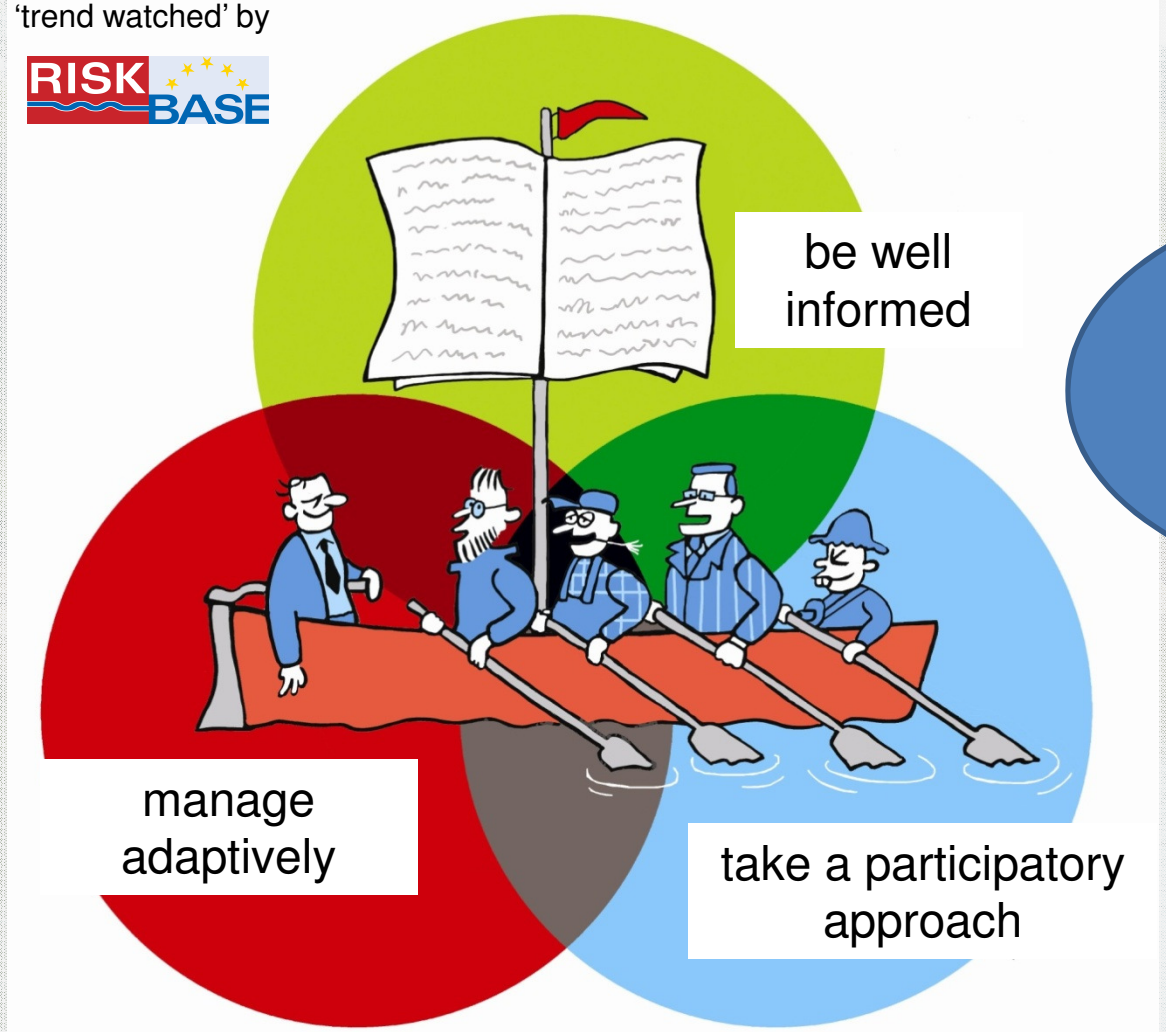


yes

Sediment management 2.0

‘trend watched’ by

RISK BASE



and
ecosystems services as common language and SSM objective

Source: Brils & Harris (Eds.), 2009. Towards Risk-Based Management of European River Basins.

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Vmm VLAAMSE MILIEUMAATSCHAPPIJ
Deltares Enabling Delta Life
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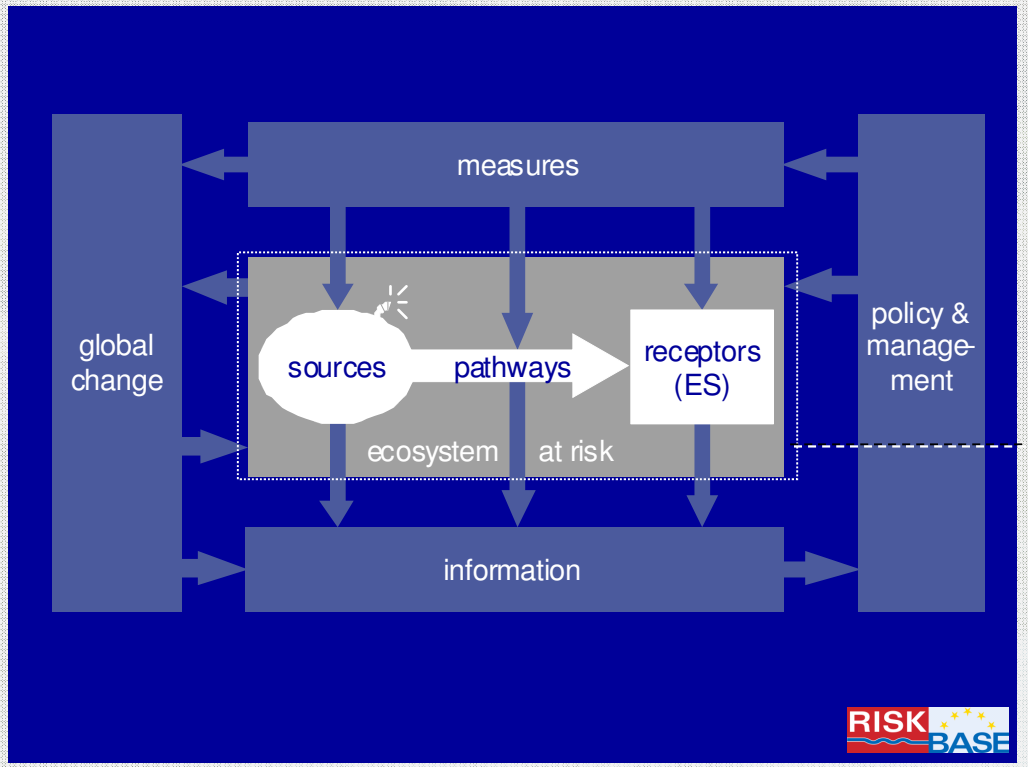
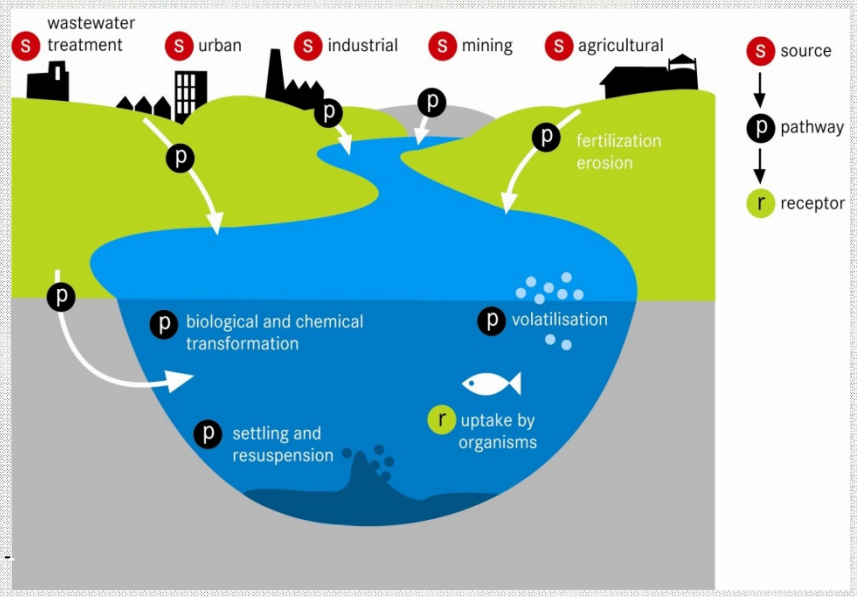
Be well informed

Understand the river basin ecosystem (course part I)



Source: Brils & Harris (Eds.), 2009. Towards Risk-Based Management of European River Basins.



Sediment and risks

Risks **of what?**

- Unforeseen changes of quality and quantity (key-issue)
- And its combined impact

Risks **to what?**

- Human health & even life (casualties)
- Biodiversity
- Physical processes
- Goods and services (impact to soil productivity, water storage, filtering capacity etc.)

Photo: Matjaz Mikos

Keep in mind:

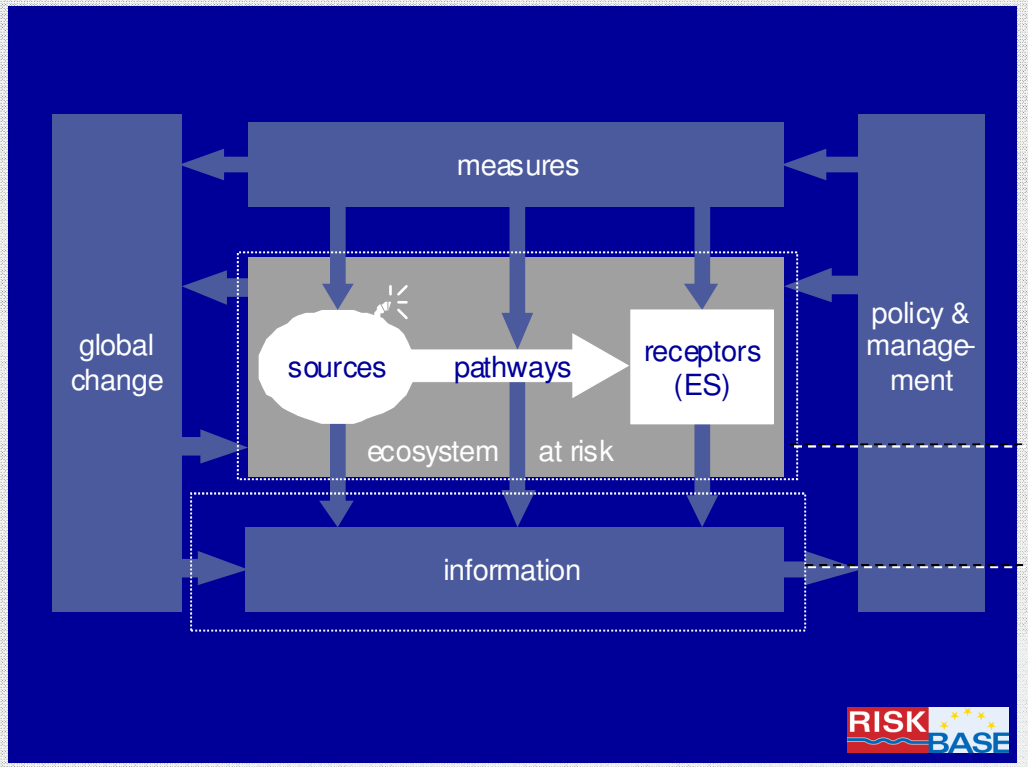
- large temporal & spatial scale AND highly dynamic

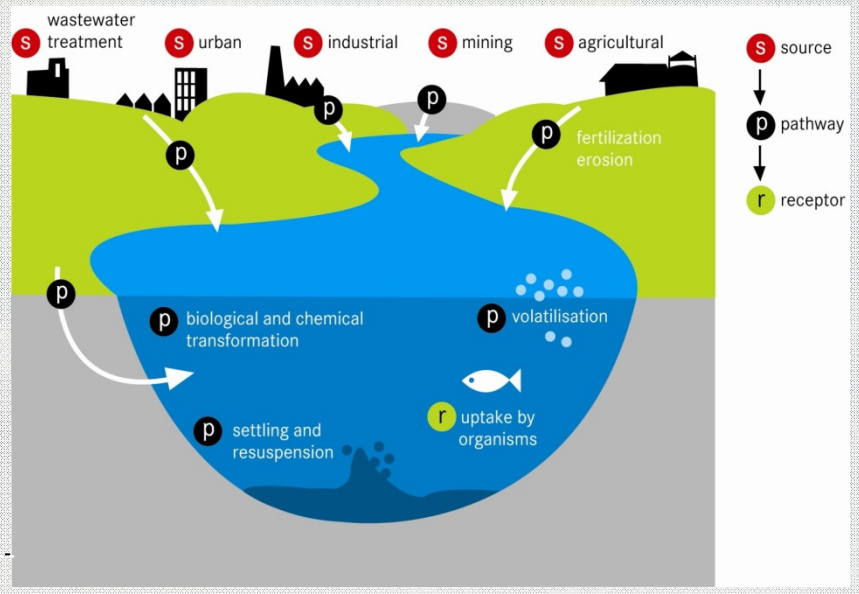
Source: Brils et al., 2009. Final conference RiskBridge

Be well informed

Understand the river basin ecosystem (course part I)

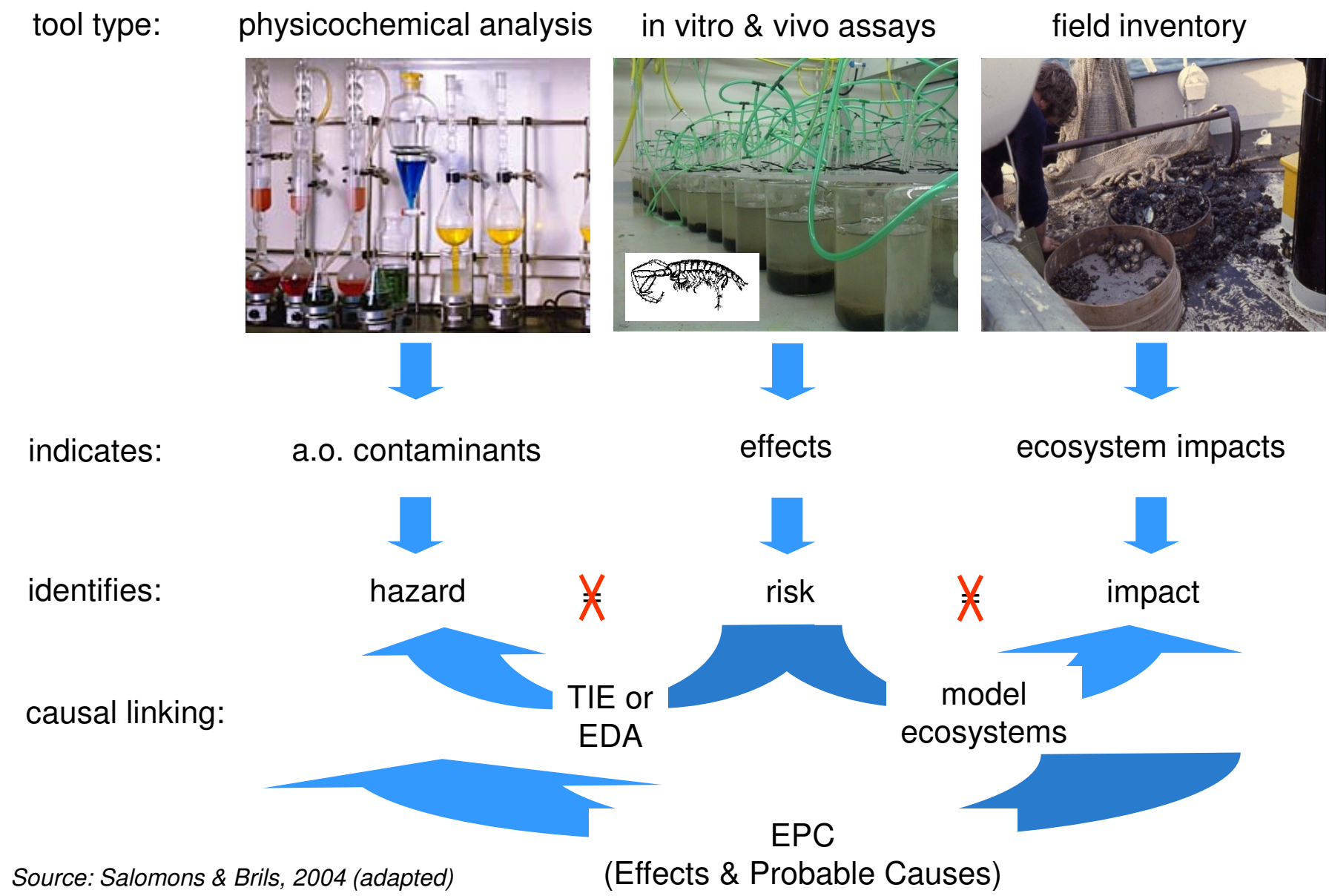
Source: Brils & Harris (Eds.), 2009. Towards Risk-Based Management of European River Basins.





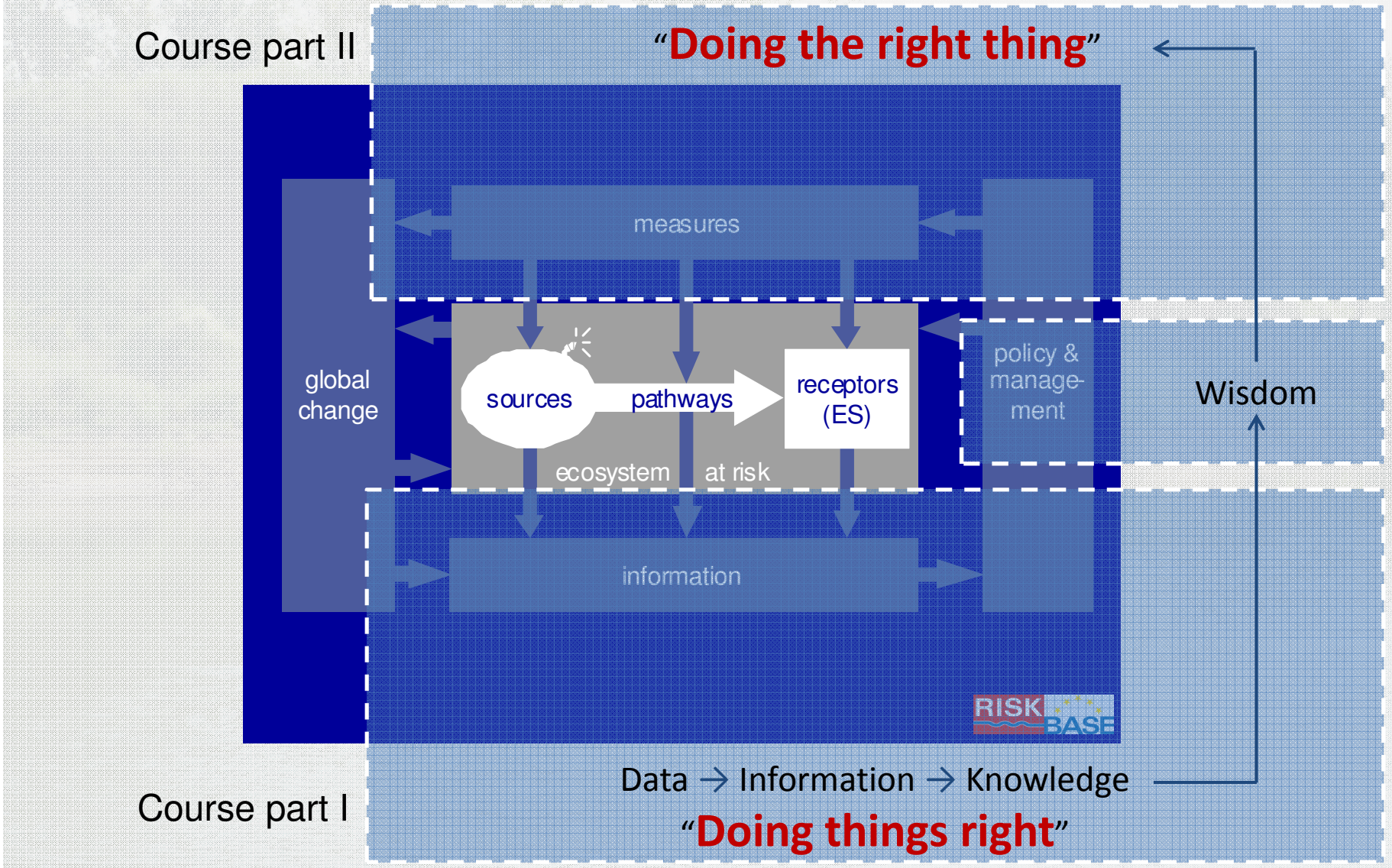
e.g. Triade

Triad approach

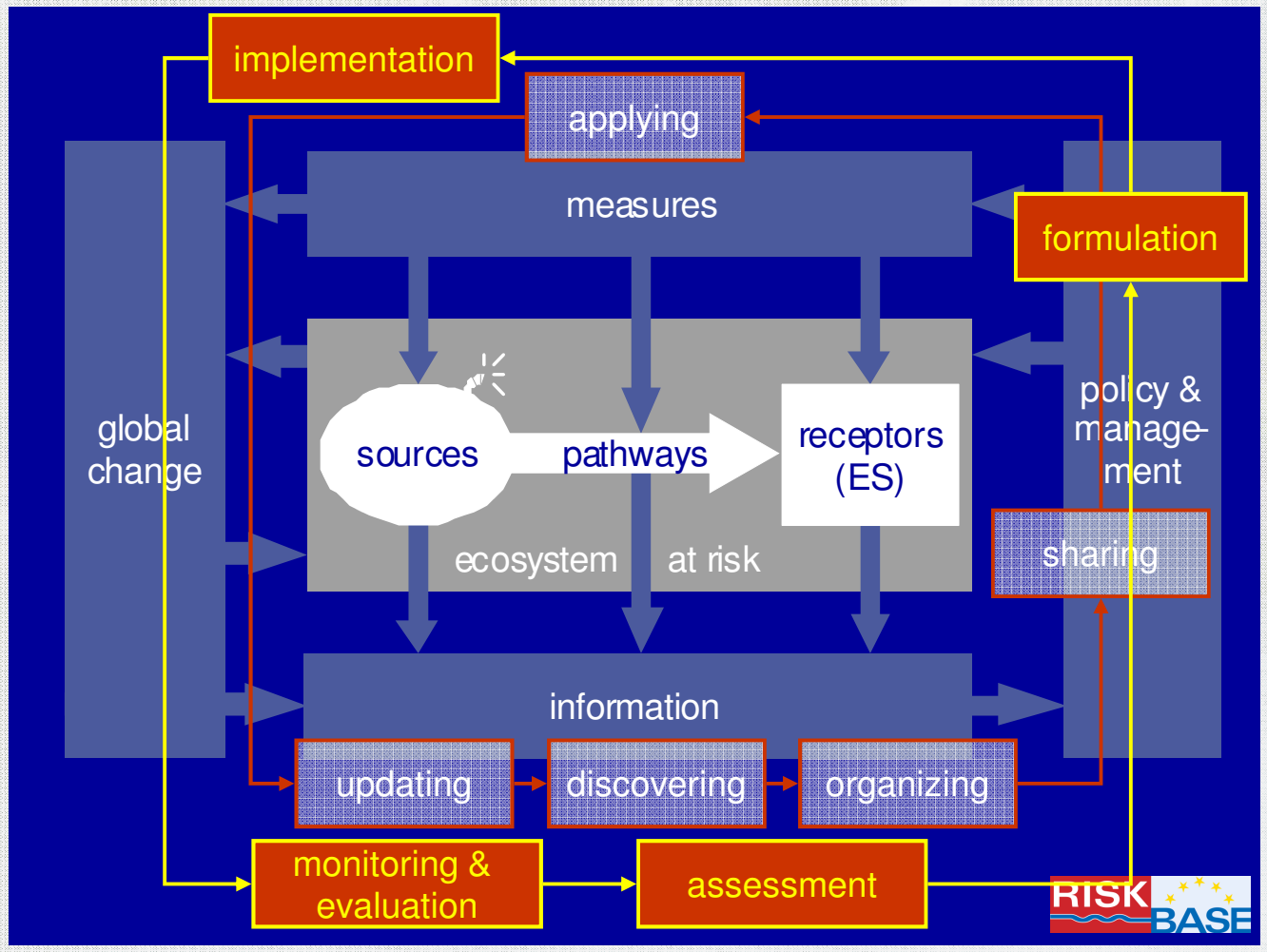


Source: Salomons & Brils, 2004 (adapted)

Be well informed



Manage adaptively (several cycli)



management

knowledge

policy

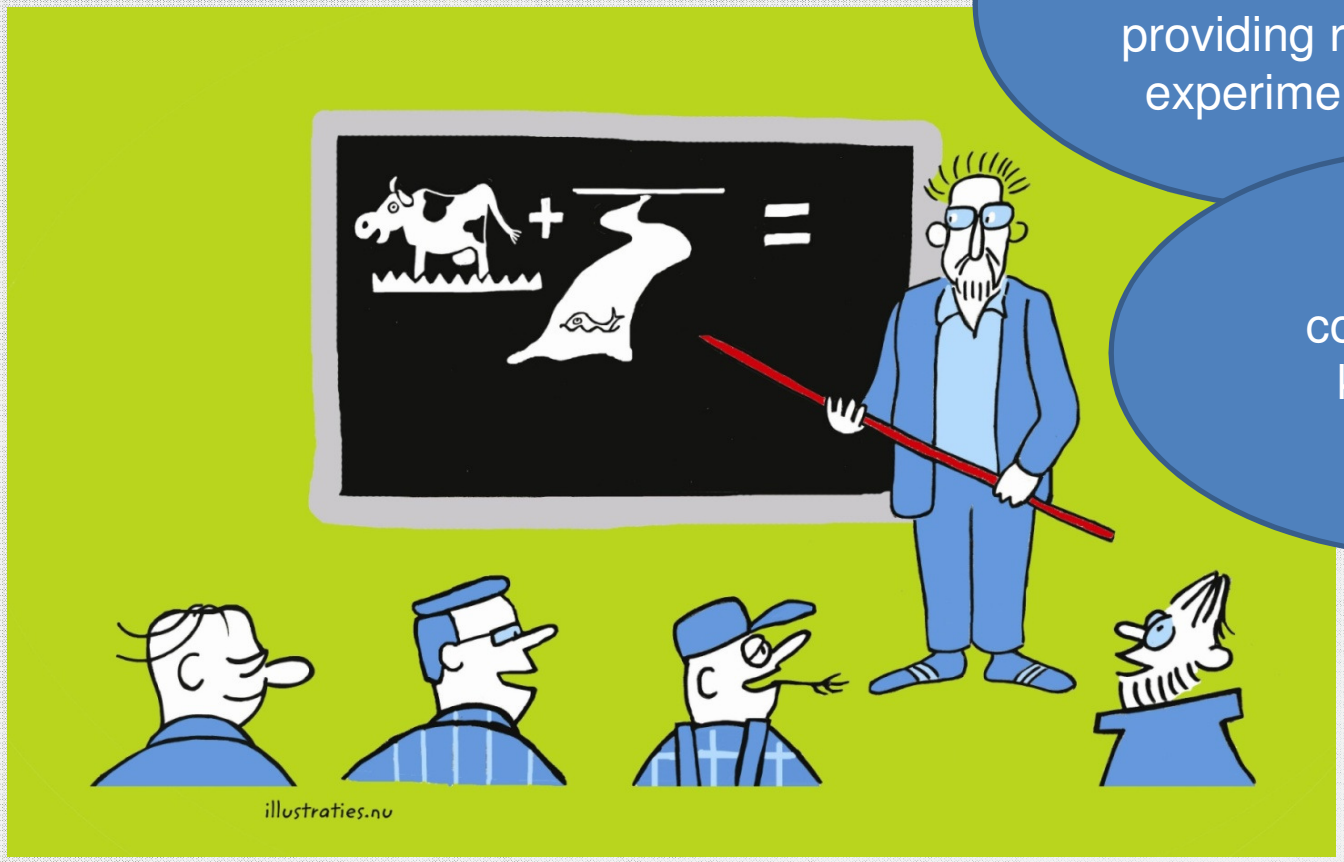
POLICY SCIENCE

PSI-CONNECT

www.psiconnect.eu

Take a participatory approach

Learning together to manage together

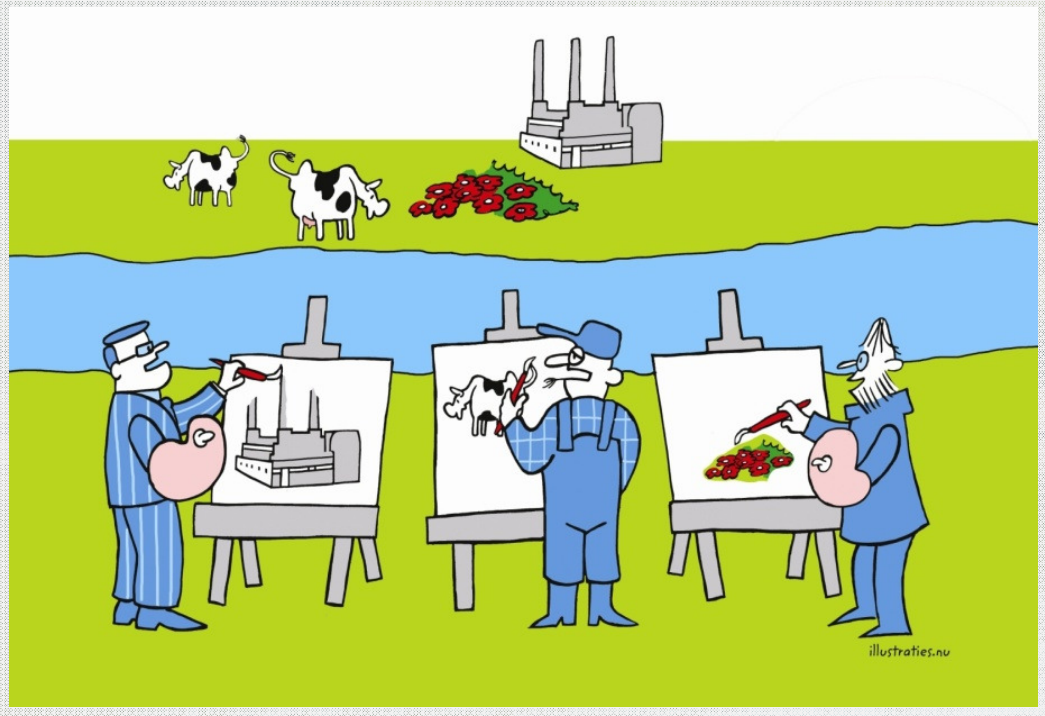


learn by doing
&
providing room for
experimentation

co-creation of
knowledge

Source: Brils & Harris (Eds.), 2009. Towards Risk-Based Management of European River Basins.

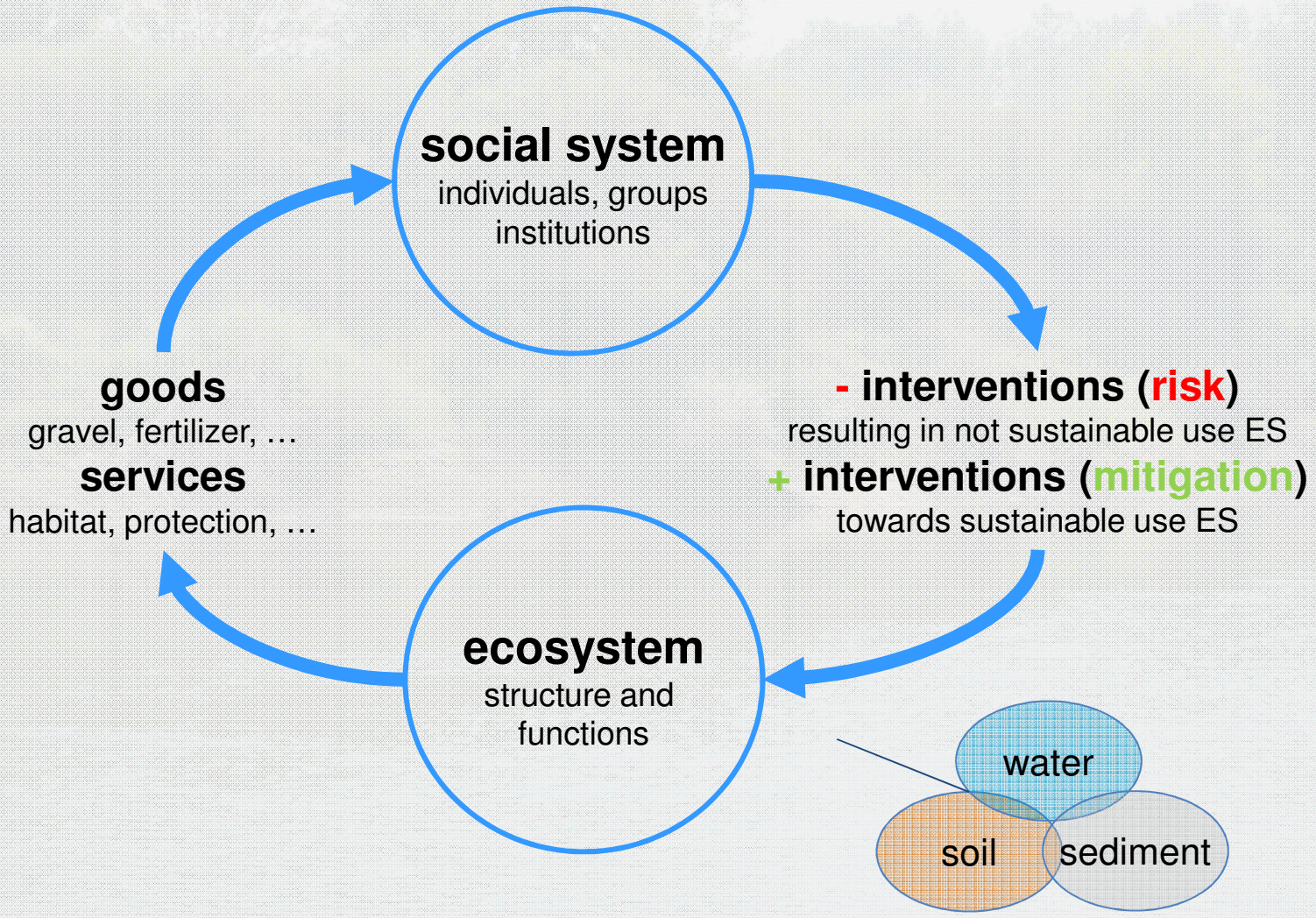
But difficulty is …



"It is human nature to stay within our own comfort zones"

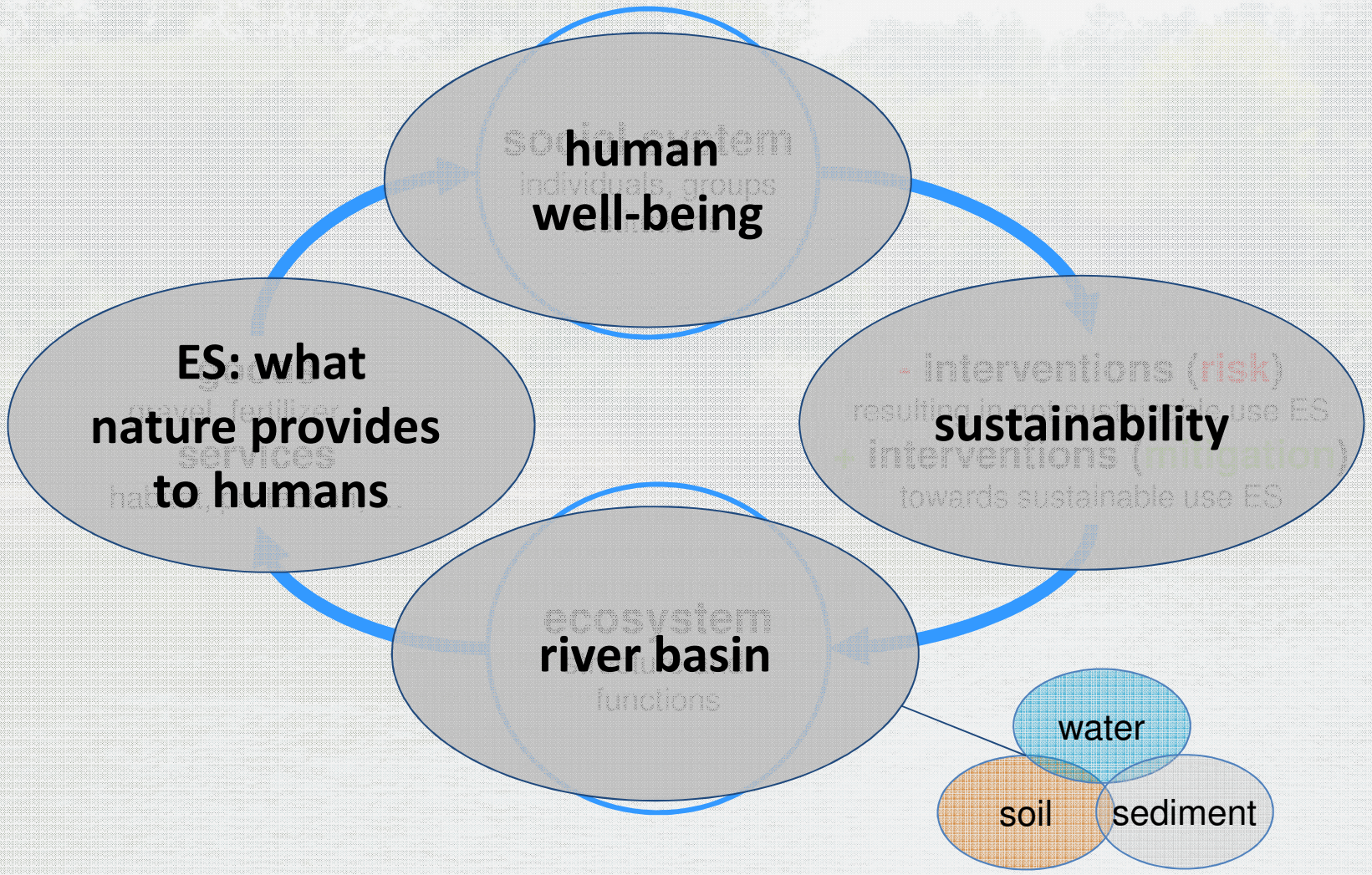
Source: Brils & Harris (Eds.), 2009. Towards Risk-Based Management of European River Basins.

Ecosystem services (ES)



Source: Brils & Harris (Eds.), 2009 & www.resalliance.org

Ecosystem services (ES)



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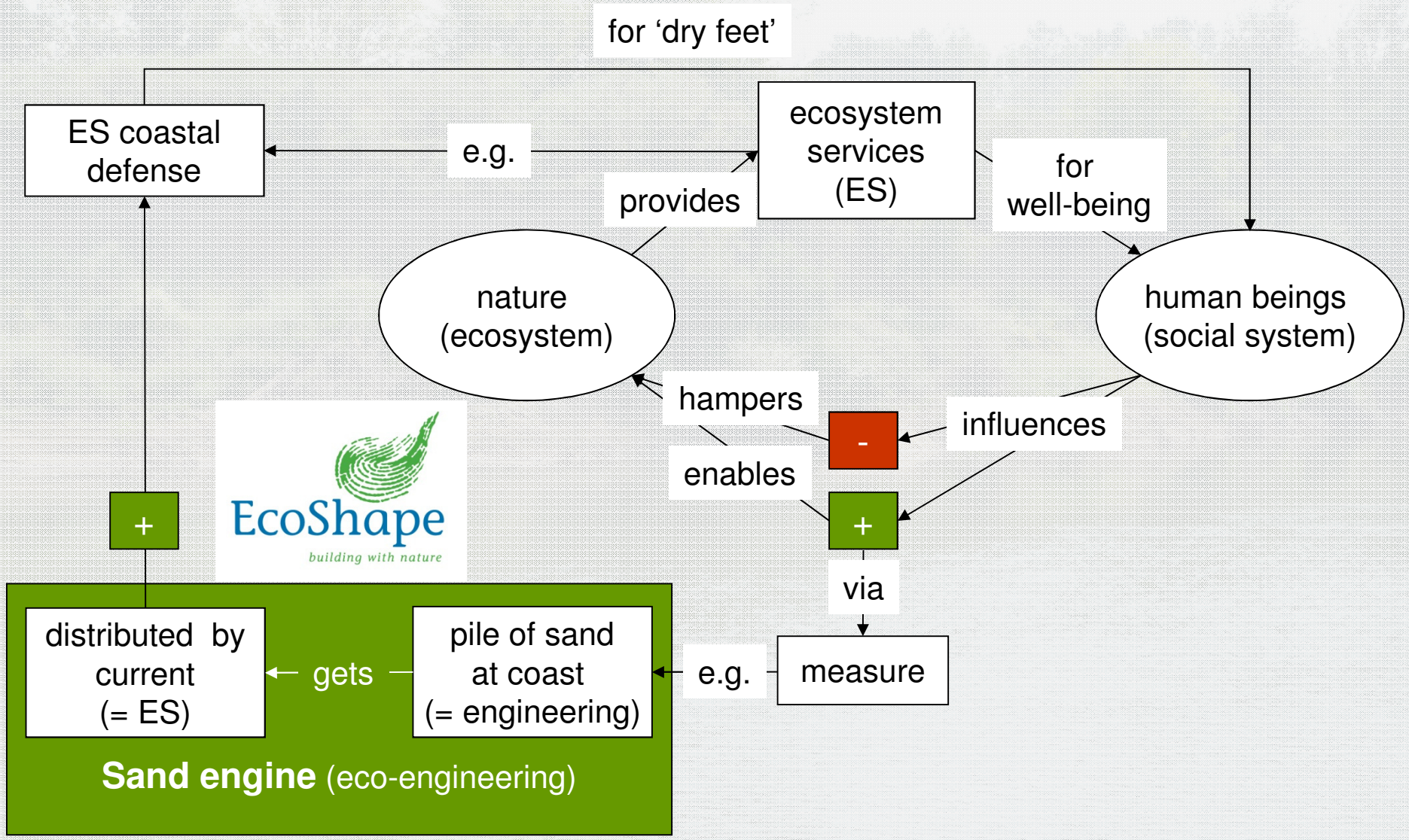
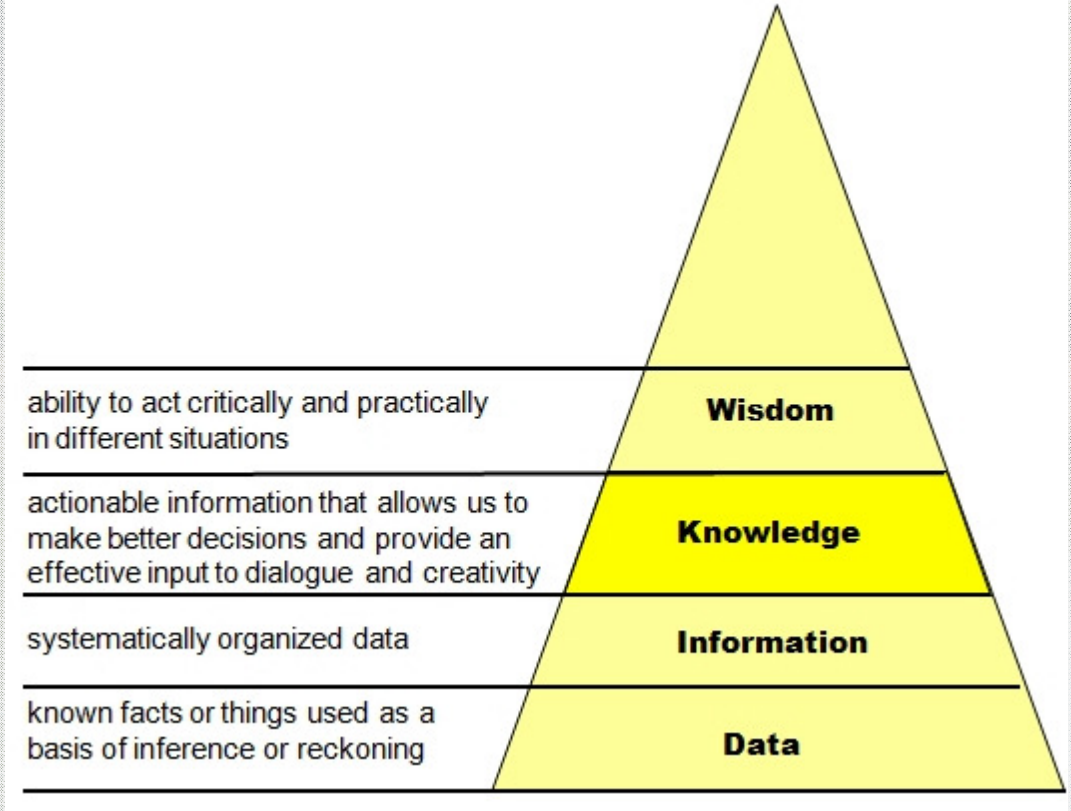
Sediment ES example



To conclude

Sediment = <u>not a waste</u> = essential and integral part of our river basins



Source: Magnuszewski et al., 2010. Report on conceptual framework for science-policy barriers and bridges. Deliverable D1.1, www.psiconnect.eu

To conclude

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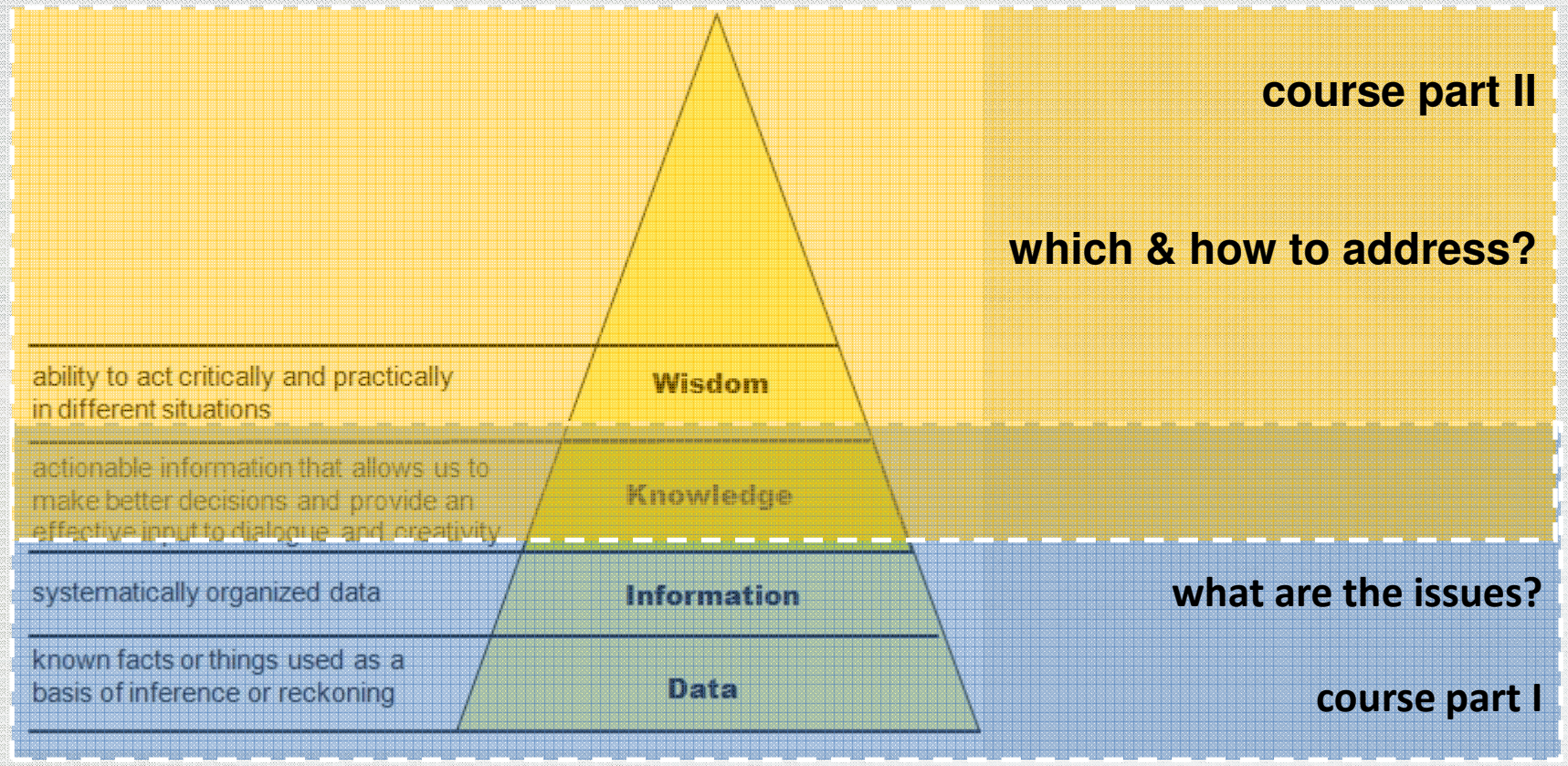
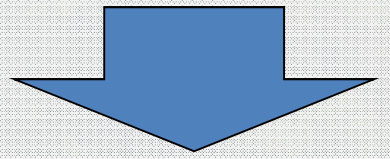


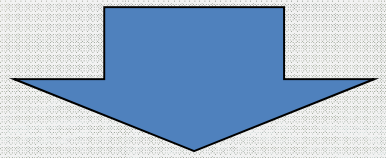
Source: Magnuszewski et al., 2010. Report on conceptual framework for science-policy barriers and bridges. Deliverable D1.1, www.psiconnect.eu

And keep in mind

A thorough analysis and shared perception of what constitutes a "problem" is necessary for addressing actual or perceived risks



the quality of the response to risk depends on
the quality of the question to the condition of risk



therefore:
take the time for
thorough problem framing

enjoy the course!

Source: Brils et al., 2009. Final conference RiskBridge

What are your expectations towards the course?

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Part I of the practical training course on sustainable sediment management with the Sava River Basin as a showcase. Zagreb, 15 – 18 October 2012

Expectations

- Xxx
- Xxxx
- Xxxx
- xxxx

Expectations

- Xxx
- Xxxx
- Xxxx
- xxxx

International Sediment Initiative

United Nations Educational, Scientific and Cultural Organization

INTERNATIONAL SAVA RIVER BASIN COMMISSION

United Nations Educational, Scientific and Cultural Organization Venice Office

Geoscience for a sustainable Earth brgm

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Hamburg University of Applied Sciences

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