



Leibniz-Zentrum für
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Impact assessment of soil protection policies in Europe

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zalf Motivation: Why bother about soil?

- Do you eat food?
- Soil formation takes thousands of years
- Inadequate use of soil leads to depletion of soil resources
 - Nutrient loss - easy to replenish by fertilizers
 - Soil loss (erosion) - not replenishable
- In Europe, an area of the size of Berlin is transformed into urban area every year
- Nothing can grow on sealed soils



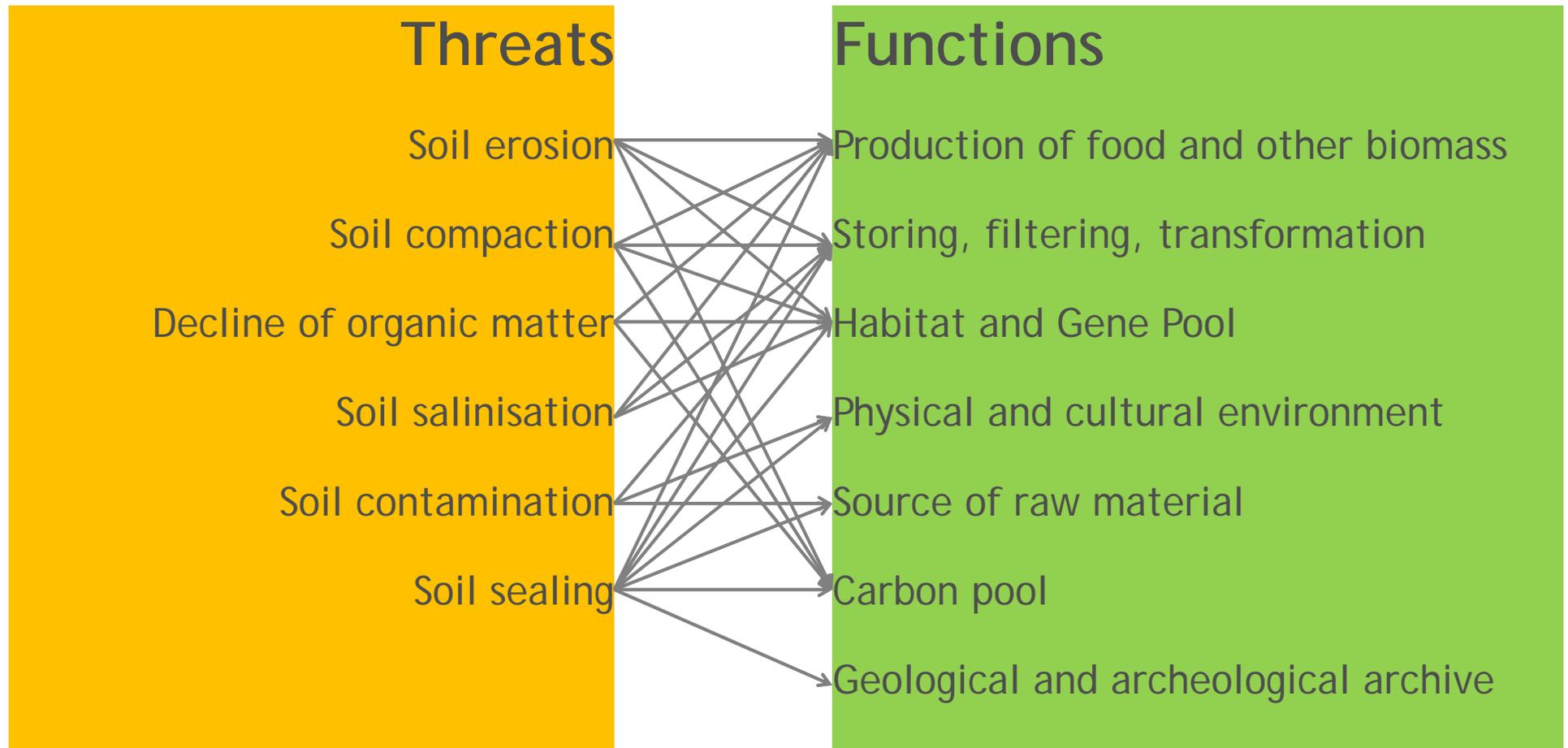
- 12% of European soils are subject to water erosion
 - 45% of European soils have low organic matter content
 - 3.5 million sites are potentially contaminated
 - 18% of European soils are moderately affected by compaction
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Background – Soil Framework Directive (2006)

- Interest in a strategic goal for soil protection in Europe
 - Proposal in 2006 for a **Soil Framework Directive** in line with e.g. Water Framework Directive
 - Not approved by all EU member states. Concerns were:
 - soil not a matter to be negotiated at European level
 - excessive administrative burden
 - scientific evidence not convincing, particularly monetary information on soil degradation
 - focus on mapping and reporting, not much on action for soil conservation
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- Resource efficiency Roadmap (2011):
 - *no net land take by 2050*
 - *decrease erosion*
 - *increase Soil Organic Matter*
 - Soil Thematic Strategy Report (2012):
 - *support soil **research** projects*
 - *focus on awareness raising of soil issues*
 - *integration of soil protection in other policies*
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- Aim: illustrate the need for a common EU soil protection framework
 - Review the 2006 proposal in light of current paradigms, emerging challenges, and state of knowledge as a **framework**
 - Provide new models and tools to assess: (i) the geographic variation and extend of soil degradation threats and respective **impacts on soil functions** (ii) impacts of management in relation to policies on soil threats and related soil functions
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Acknowledgement of soil functions in existing EU policies

Existing EU policies				
Soil functions	Water Framework Directive	Habitat Directive	Renewable Energy	Common Agricultural Policy
Production of food			x	x
Storing/filtering	x			x
Habitat / gene pool		x	x	
Physical / cultural		x		
Raw materials				
Carbon pool			x	
Geological and archeological		x		

Integration of soil in other policies might address all soil functions, but at the expense of other functions?



- Integrating multifunctionality of soils

Soils should provide more than one function

Focus on one function (e.g. biomass production) may lead to the depletion of the other functions (e.g. habitat pool, storing capacity)

Spatial and temporal scales (short term / long term)

- However, specific soils should be acknowledged (e.g. high capacity for carbon sequestration) depending on eg. soil type or land-use
 - Maintaining soil functions is today more important and more difficult than ever, because of the loss of land and because of the reinforced demand for agricultural products
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Europe 2020 strategy: Grand Societal Challenges

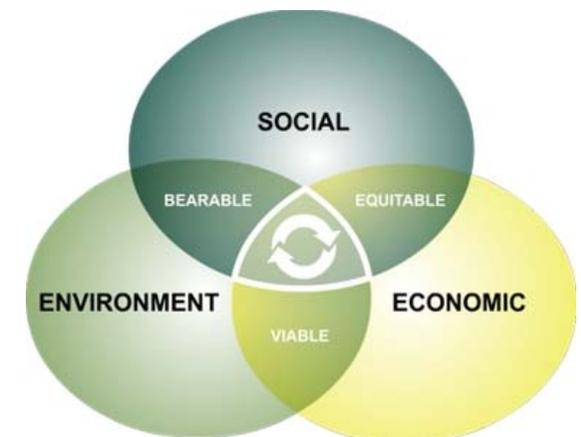
- Health, demographic change and well being
 - **Food security, sustainable agriculture**, marine and maritime research and the bioeconomy
 - Secure, clean and efficient **energy**
 - Smart, green and integrated transport
 - **Climate action, resource efficiency** and **raw materials**
 - Inclusive, innovative and secure societies
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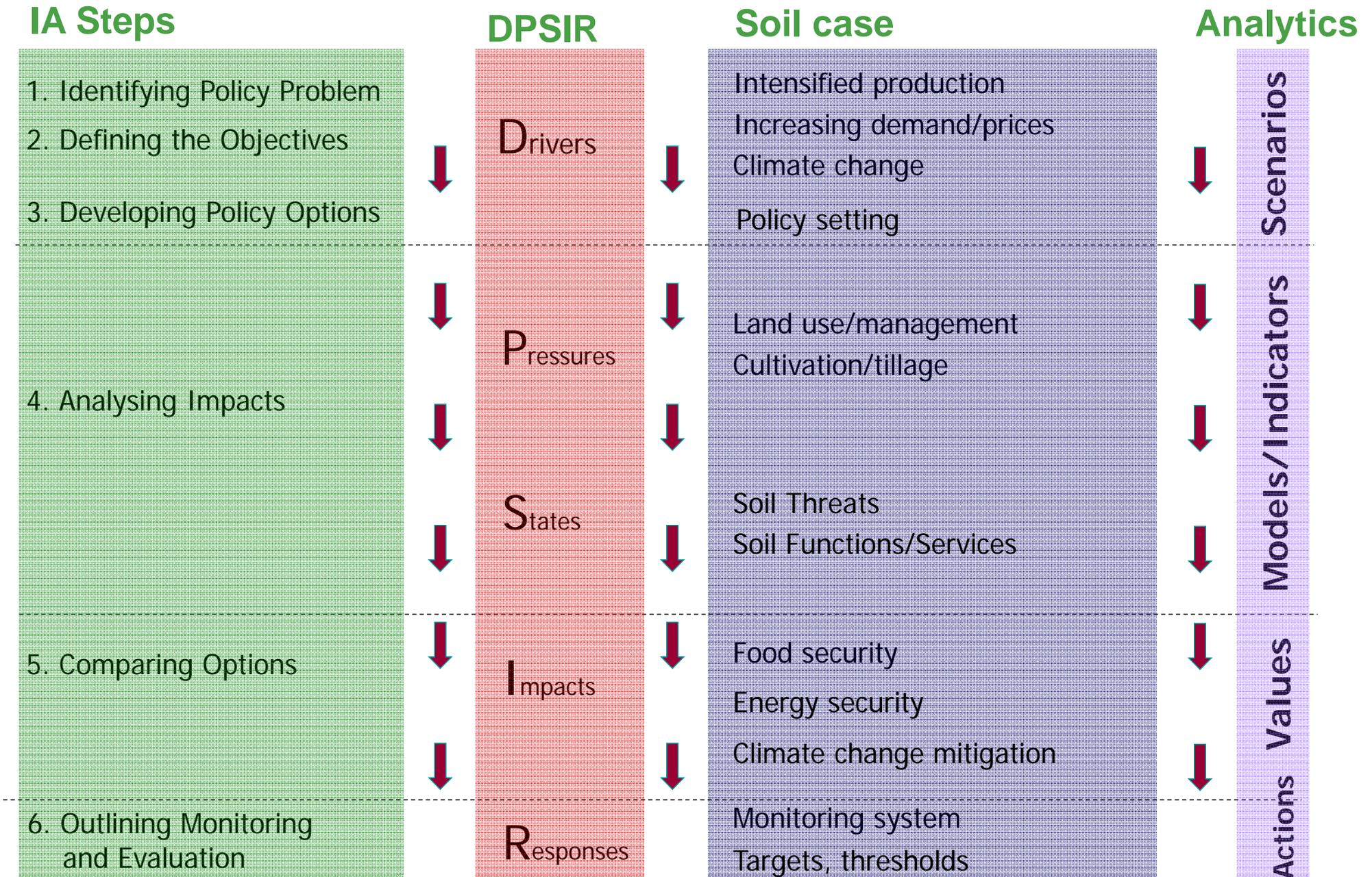
- Emergence of grand society challenges at European level
 - New paradigm on soil functions rather than soil threats
 - Improved understanding of IA methods and potentials
 - Improved science policy interaction
 - Availability of new methods, tools and data for assessing the relations between soil management, soil threats, soil functions, grand societal challenges
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Standardised procedure, mandatory for all policies

6 Steps of impact assessment

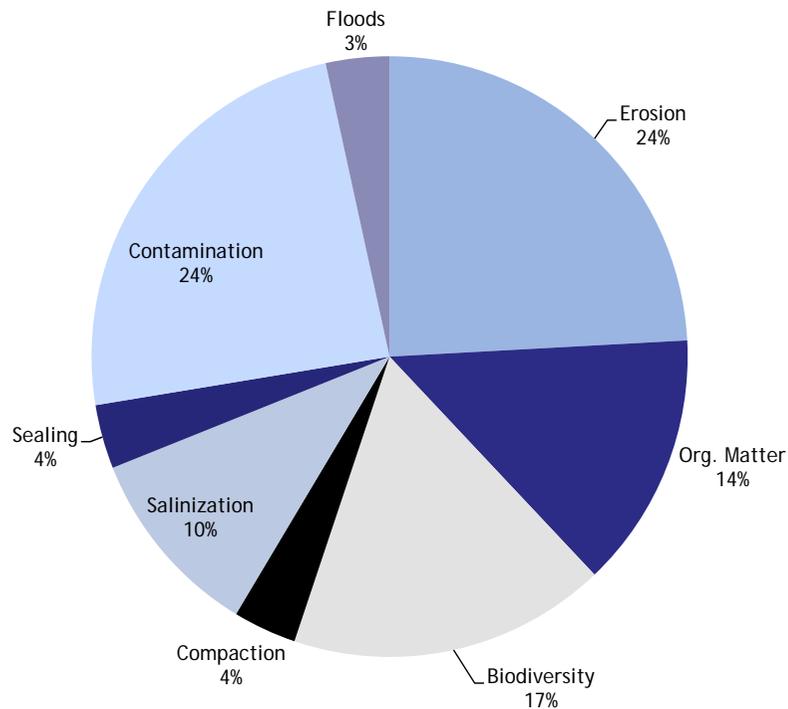
1. Identifying the policy problem
2. Defining the objectives
3. Developing the main policy options
4. Analysing their impacts
5. Comparing the options
6. Outlining policy monitoring and evaluation



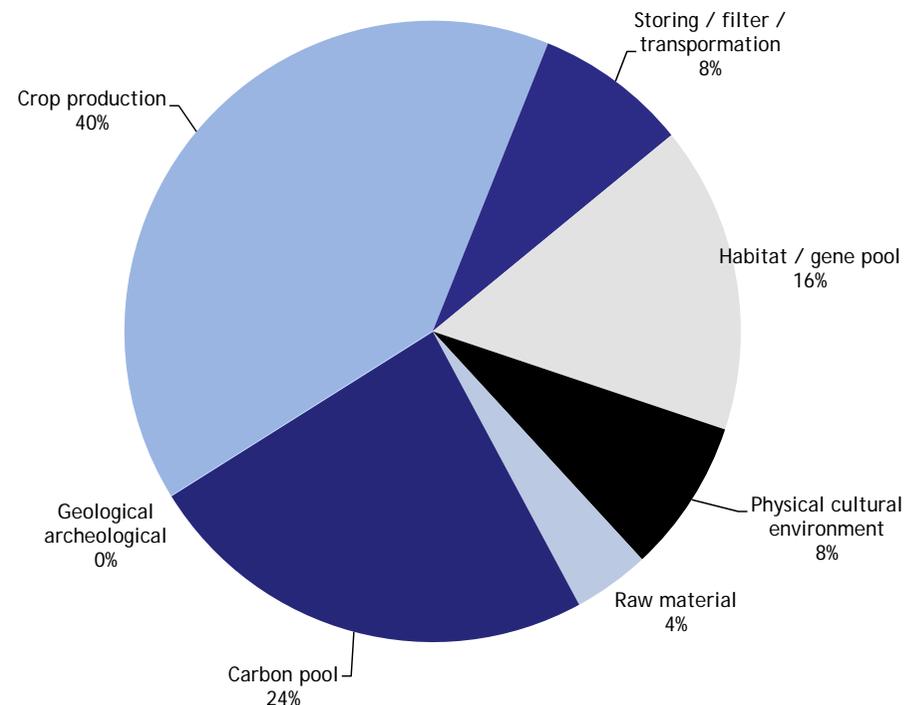


- Research trends of European soil policy interaction since 2007
- Literature review, Web of science: TS=(soil polic* europe*). Hits: 282; selected: 49. Selection criteria: main target of the paper was to discuss, analyze, or compare different policies

Papers within soil threats



Papers within soil functions





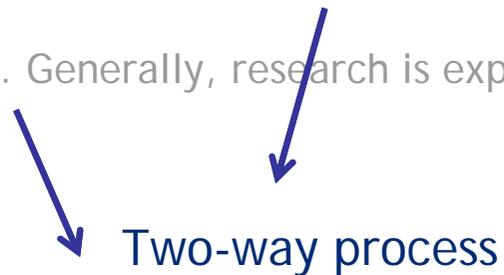
Research agenda for policy relevant soil research

- How do economic activities and policies **other than agriculture** affect soil functions (urbanization, infrastructure, traffic, energy production, mining, tourism, other)?
 - How can **non-use services** be acknowledged?
 - How can **indirect impacts of soil use** and management be identified and accounted for in policy? E.g. the impact of soil sealing (land take) on increased probabilities of flooding
 - How can spatial spill-over effects of soil use and management be accounted for in policy? E.g. the international impacts of domestic bioenergy promotion on **land use change elsewhere in the world**
 - What are the legal relationships of **those who own / manage soil** and **those who benefit** from soil functions and/or are affected by soil degradation?
 - How can **multifunctionality** be integrated into the planning process of land related activities? This is particularly challenging since soil functions may be contradictory to each other.
 - Development of instruments for policy able to assess **impacts of future policy** and planning decisions, thereby addressing the “what-if” question with adequate spatio-temporal scope
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How to bridge the gap between soil science and policy?

- Will a **paradigm shift** convince policy makers?
- **Transparency of soil related data** and knowledge by **data centers** that link regional and national data centers in Europe and abroad.
- **Availability** to public of research data. So follow-up research can make use of it. Intellectual property rights of data sources need to be clarified.
- **Harmonization** of data, tools and indicators. Next step: in a format that is useful for policy makers.
- Integration and flow of information between basic research and applied research on one side, and between applied research and policy decision support on the other side. **Risk that policy relevant research is decoupled** from basic research, and therefore from latest scientific information.
- Make **policy needs for scientific information** transparent to researchers. Maybe intermediates (e.g. political scientists) play a role in making this mutually transparent.
- Make **research transparent to policy makers**. Generally, research is explorative, is about asking questions and not about finding solutions.



Thank you for your attention

