Social Dimensions of Risk and Vulnerability

State of Research

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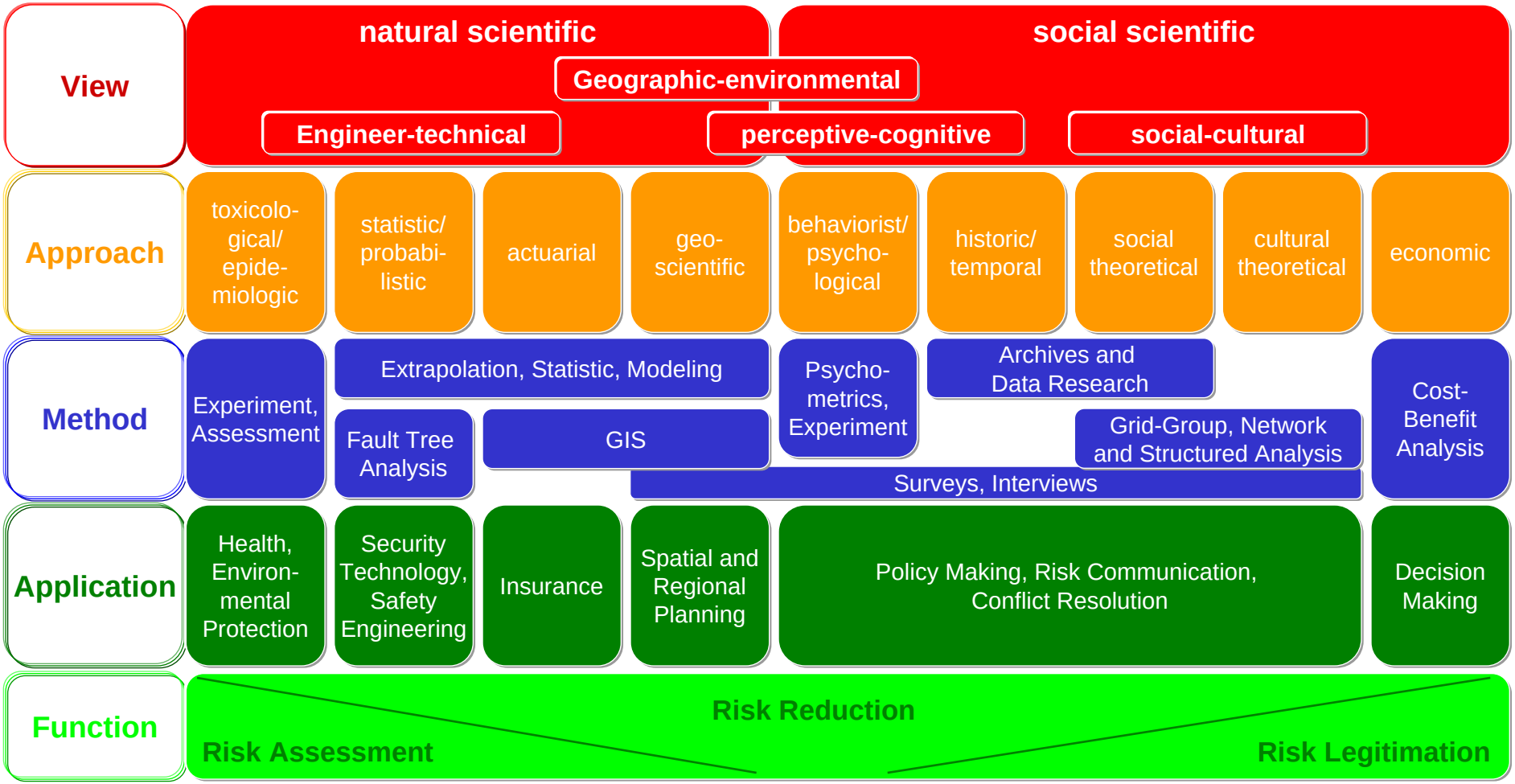
Outline

- Setting-the-stage: „*Science of Vulnerability*“
- State-of-the-art: „*Vulnerability of Science*“
- Synthesis: „*What‘s next?*“

Photo: Weichselgartner

Risk perspectives



after Dikau & Weichselgartner (2005): *Der unruhige Planet*. WBG, Darmstadt, page 29.

Vulnerability science

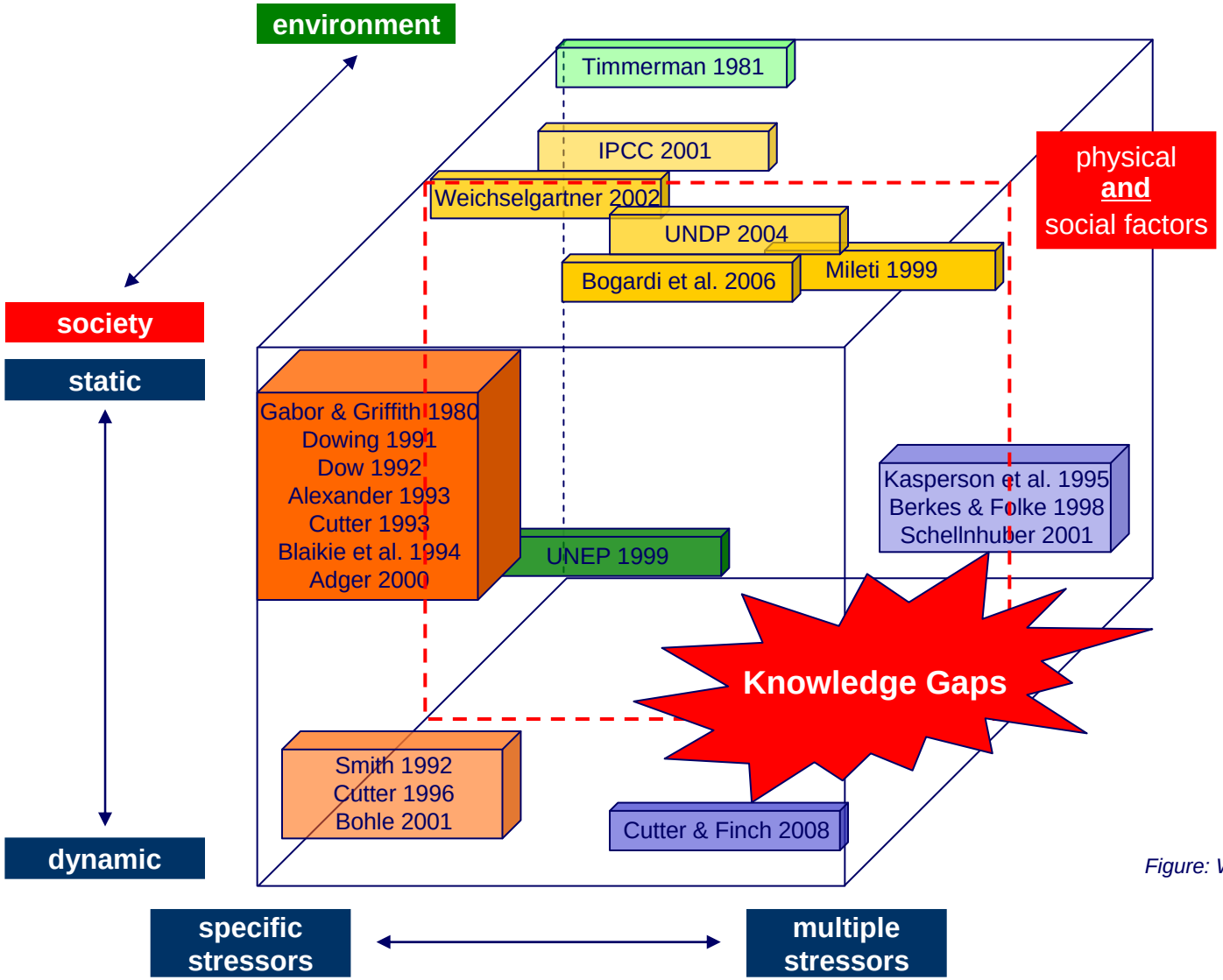


Figure: Weichselgartner

Vulnerability characteristics

1) **multi-dimensional**

(economic, geophysical, historical a.o.)

2) **socially divergent**

(varies individually, among/within groups)

3) **scale dependent**

(varies temporally, spatially, unit of analysis)

4) **dynamic**

(driving forces change over time)

5) **interactive**

(driving forces influence each other)

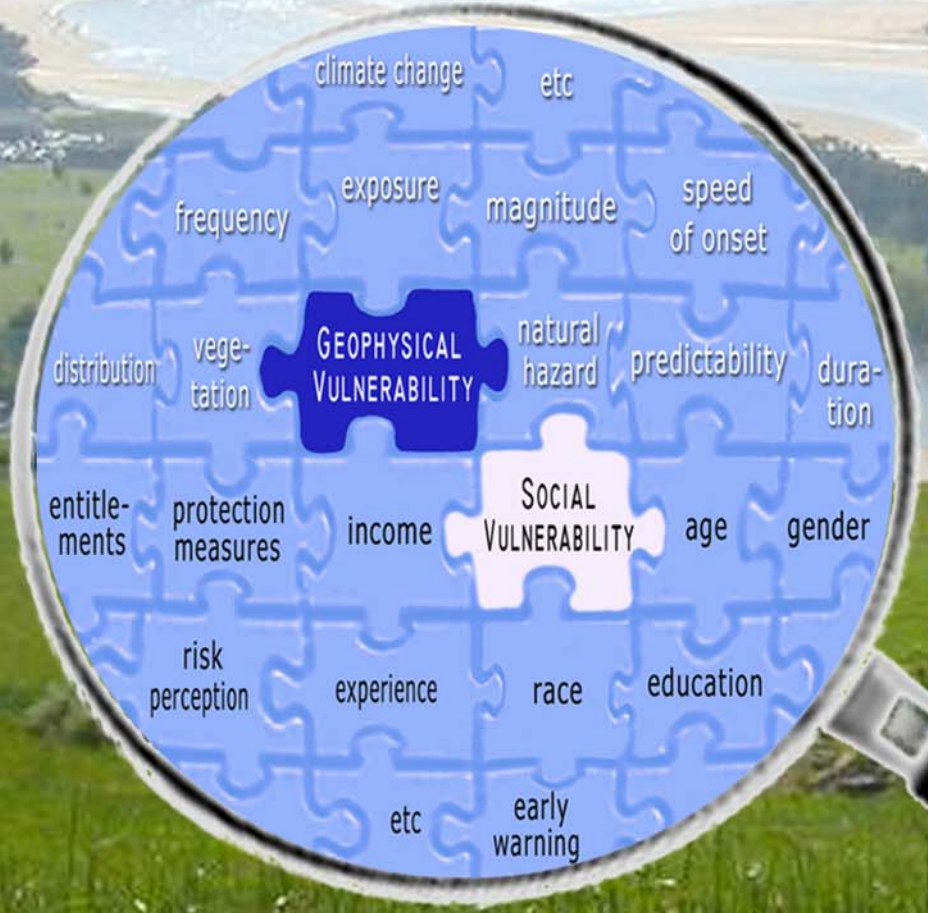
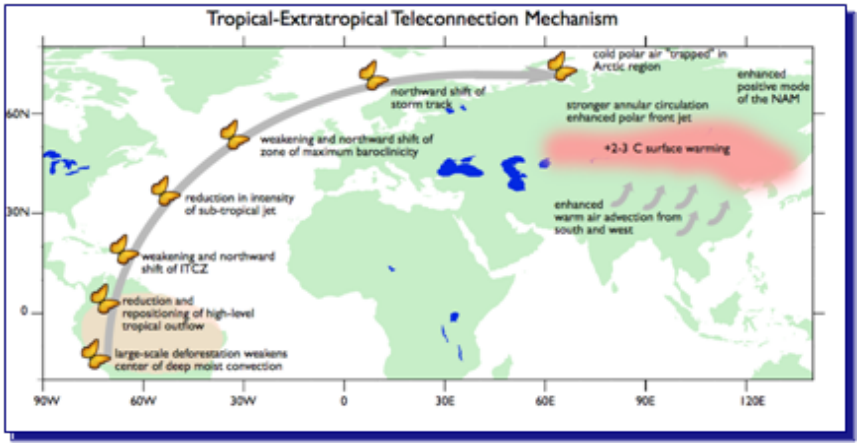


Figure: Weichselgartner

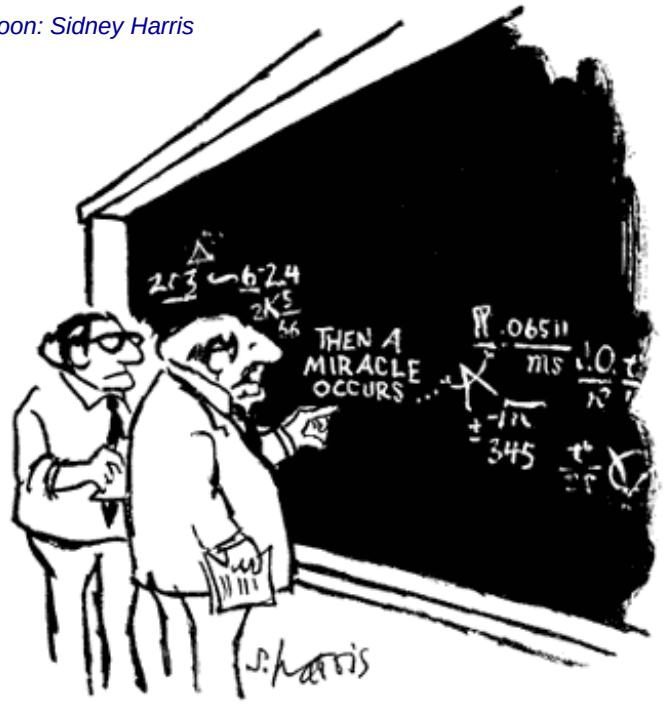
What are barriers?

- Process characteristics
  (dynamic, interactive etc)
- Scale interactions
  (spatial/temporal; up-/down scaling)
- Example: teleconnections



Snyder, Delire & Foley (2004): Evaluating the influence of different vegetation biomes on the global climate. *Climate Dynamics* (23): 279-302.

Cartoon: Sidney Harris

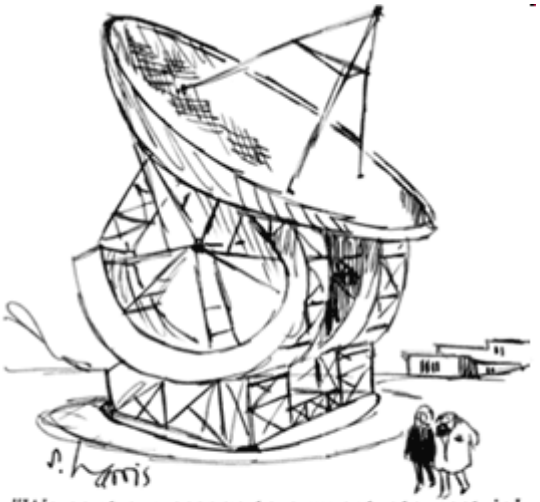


"I think you should be more explicit here in step two."

Process-level: understanding

What are barriers?

- Language-conceptual dissonance
- Availability, quality and transferability of data/models
- Processing and dissemination of knowledge
- Example: ozone depletion



"We sent a message to any extraterrestrial beings in deep space. It was picked up by an observatory in Great Britain. They didn't understand it."

Cartoon: Sidney Harris

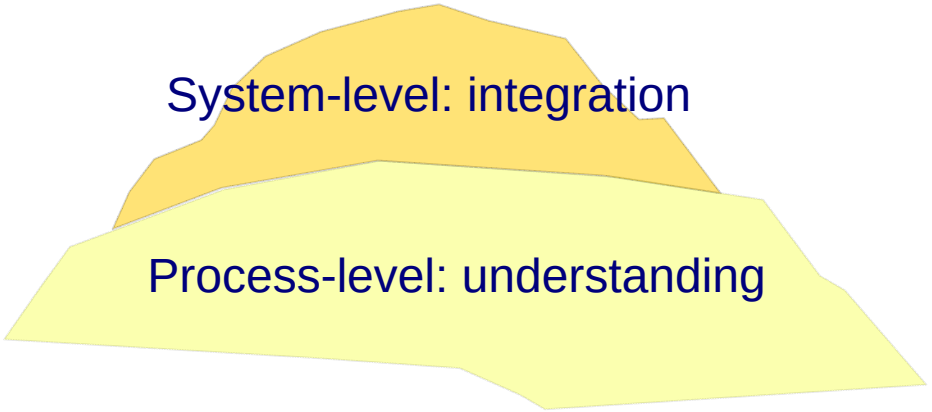
Sun

Scientists reveal shocking discovery:

UFO aliens found at South Pole

ETs are burning up Earth's ozone

Sun, 16 December 1986



What are barriers?

- Responsibilities
  (institutions, foci)
- Funding mechanisms
  (duration, scope)
- Science-policy-practice interface
  (social, structural, functional barriers)
- Example: vulnerability research

Cartoon: Sidney Harris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Barriers in the science-policy-practice interface: Toward a knowledge-action-system in global environmental change research

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ARTICLE INFO ABSTRACT

Practice-level: application

System-level: integration

Process-level: understanding

Weichselgartner & Kasperson (2010): Barriers in the science-policy-practice interface: toward a knowledge-action-system in global environmental change research. *Global Environmental Change* 20 (2): 266-277.

Risk governance

- A changing „landscape of risk responsibility" in Europe?

⇒ *Legislations, programs and/or agencies operating at the national and European levels are increasingly encouraging or even requiring private companies, voluntary organizations and individuals to take more responsibility for their actions with regard to natural hazards*

Johnson & Priest (2008): Flood Risk Management in England: A Changing Landscape of Risk Responsibility. *Water Resources Management* (24): 513-525.

- Individualisation of risk

⇒ *Example German Federal Water Law (31.07.2009)*

§ 5(2) Every person who can be affected by a flood, is obliged to implement prevention measures in accordance with his possibilities and abilities

Steinführer & Kuhlicke (2007): Social Vulnerability and the 2002 Flood: Country Report Germany (Mulde River). FLOODsite report T11-07-08. Helmholtz Centre for Environmental Research - UFZ, Leipzig.

Risk governance

Country/Region	Hazard	Prevention …
Germany	**floods**	**obligatory (according to abilities)**
England/Wales	**floods**	**encouraged**
Switzerland	**alpine hazards**	**encouraged**
Italy	**floods**	**encouraged**
Spain	**droughts**	**encouraged**
France	**floods**	**not expected**
Slovenia	**floods**	**not expected**

Walker, Whittle, Medd, & Watson (2010): Risk Governance and Natural Hazards. CapHaz-Net WP2 Report. Lancaster University, Lancaster Environment Centre, Lancaster. Available via www.caphaz-net.org

Social dimensions

- What makes people to take over responsibility?
- Can everyone take over responsibility?

CapHaz-Net: "Social Capacity Building for Natural Hazards"

⇒ *Documents state-of-the art of social science research on natural hazards as well as research gaps*

www.caphaz-net.org

Risk perception

- Risk perception … and preventive actions?

Wachinger & Renn (2010): Risk perception and natural hazards. CapHaz-Net WP3 Report. DIALOGIK, Stuttgart.
Rerpstra (2009): Flood Preparedness: Thoughts, Feelings and Intentions of the Dutch Public. PhD-Thesis. University of Twente, Twente.

⇒ *Being aware and being informed about* ↛ *preventive actions*

Personal characteristics
- homeownership
- gender
- age
- education
- income

Responsibility distribution
- between governments/ authorities and citizens

Prior experience

Appraisal
- sense of helplessness and powerlessness
- attributions (of effects, controllable/uncontrollable)

Social trust
- governments/authorities
- media
- experts

Risk factors
- perceived frequency and consequences

Behavior
- preventive actions

Risk perception

- Risk perception … and preventive actions?

⇒ *Some implications for risk communication*

Prior experience → *Events as "window of opportunity"*

Appraisal
- sense of helplessness and powerlessness
- attributions (of effects, controllable/uncontrollable)

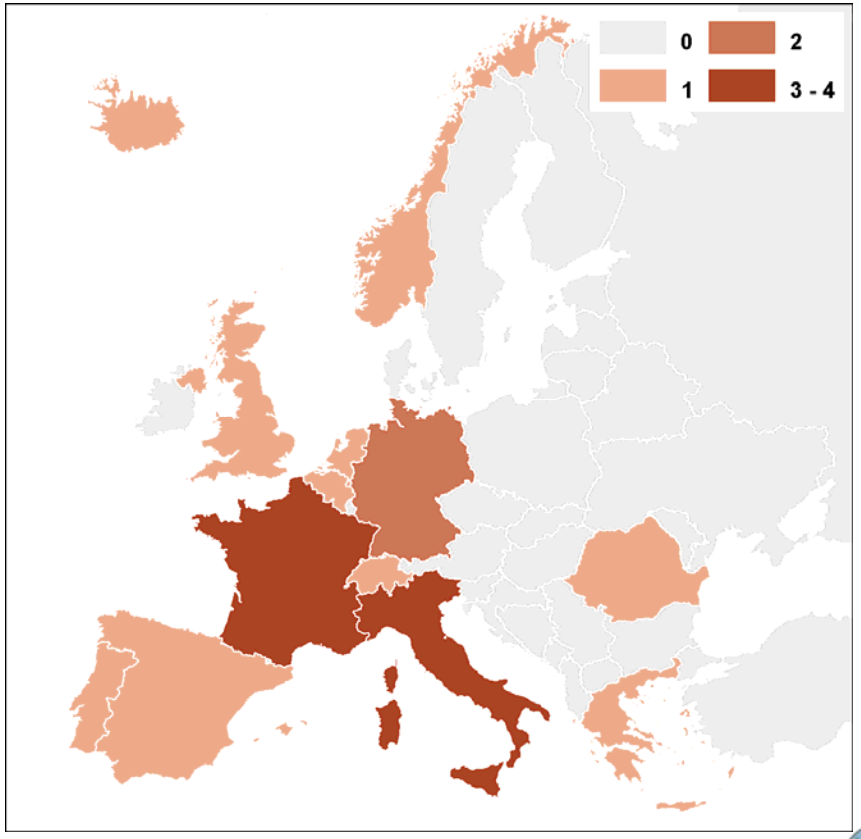
Social trust
- governments/authorities
- media
- experts

→ *Maintaining and/or developing trust among actors*
=> not only informing", but also two-way communication

Social vulnerability

Social Vulnerability

How exposed people are, how they adapt to and cope with the impact of disasters is also dependent on their socio-economic-demographic status within a society



⇒ *vulnerability research in Europe at a rather early stage*

⇒ *so far mostly in "developing countries" and North America*

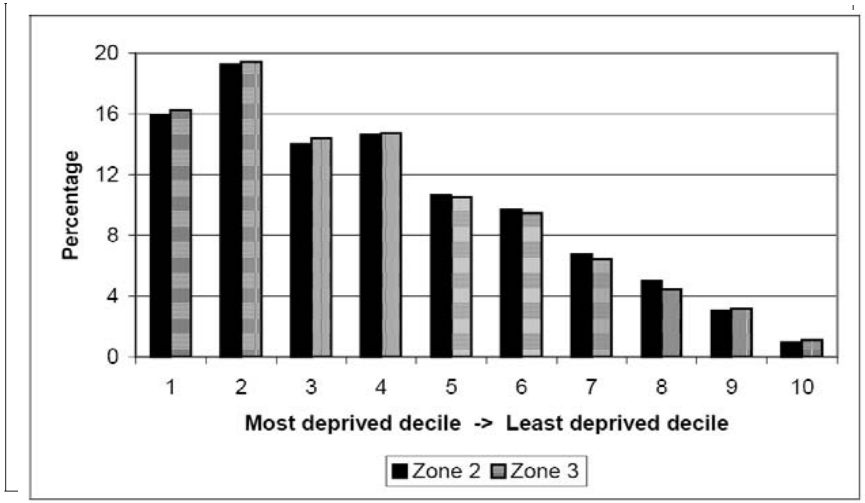
Tapsell, McCarthy, Faulkner & Alexander (2010): Social vulnerability to natural hazards. CapHaz-Net WP4 Report. Flood Hazard Research Centre, Middlesex University.
Available via www.cahpahz-net.org

Social vulnerability

- Social Vulnerability … unequal exposure?

⇒ *Exposure to flood risk: An example from the UK*

Percentage of population living in *sea* flood risk areas (low/medium to high[1])



Walker, Burningham, Fielding, Smith, Thrush & Fay (2007): Addressing environmental inequalities: flood risk. Environment Agency, Bristol.

[1] Zone 2: up to 1/1,000 years for rivers and sea

Zone 3: up to 1/100 years for rivers &
up to 1/500 years sea

- Explanations?:

⇒ *One explanation: historic patterns of urban development*

Social vulnerability

- Social Vulnerability … unequal capacities?

Coping and adaptive capacities with regard to recent flood events

Kuhlicke, Scolobig, Tapsell, De Marchi & Steinführer (submitted). Contextualising Social Vulnerability: Findings from case-studies across Europe. *Natural Hazards*.

German Case study	Italian Case study	England/Wales Case study
Survey N = 404 (2005)	Survey = 400 (2005/2006	Survey = 2.124 (2002-2005
Participant Observation (15 M)	Participant Observation (3 M)	
Semi-structured Interviews (N = 22)	Semi-structured Interviews (N = 18)	
	Focus groups (N = 2)	Focus Groups (N = 17)

Social vulnerability

- Social Vulnerability … unequal capacities?
  Coping and adaptive capacities with regard to recent flood events

Kuhlicke, Scolobig, Tapsell, De Marchi & Steinführer (submitted). Contextualising Social Vulnerability: Findings from case-studies across Europe. *Natural Hazards*.

Findings:

⇒ *There was not a common set of social vulnerability indicators which proved to be valid at a cross-country level for all the disaster phases, apart from 'location'.*

Implication:

⇒ *How to 'measure' the 'soft' dimension of vulnerability? 'Classical' vulnerability indicators (income, age, education, gender etc.) might not be appropriate in many European contexts*

Synthesis

Risk governance

- changing landscape of risk responsibility (intended and unintended consequences)

Risk perception/communication

- challenge for risk managers

Social vulnerability

- underlying structures/processes

Science-practice interface

- crucial to overcome barriers

Cartoon: Sidney Harris

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Photo: Weichselgartner