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Consistent context scenarios:
a new approach to 'story and simulation'

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- conceptual ideas on CIBAS
- expected potential and limits

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Approaching futures of coupled human-environmental systems

modeling and simulation

- systems analysis
- integrated modeling

combining numerical modeling with qualitative scenario techniques (SAS)

➔ used for scientific exploration and to inform public and political debates

➔ but: usefulness and credibility of SAS scenarios for „producer-users“ and „recipient-users“ (e.g. Parson 2008, Pulver/ VanDeveer 2009) ?

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Focus

Aims: to reflect current approaches and to discuss a new approach

Question: (If and) how could CIB be used within a new approach to SAS and what potential benefits and limits can we expect from ‘CIBAS’ (i.e. CIB And Simulation)?

Methods:

- literature review
- expert interviews
- conceptual ideas and expectations on potential and limits of ‘CIBAS‘
- (empirical exploration and evaluation of CIBAS via case studies)

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‘Story And Simulation‘ (SAS) (Alcamo 2001, 2008)

- **Basic idea**: to explore futures of coupled human-natural systems by combining numerical simulation models with qualitative storylines

- **Central assumption:** combination of ‘qualitative’ with ‘quantitative’ scenario approaches benefits from the advantages of both (Alcamo 2008: 124; Kemp-Benedict 2004:1; Winterscheid 2007: 54).

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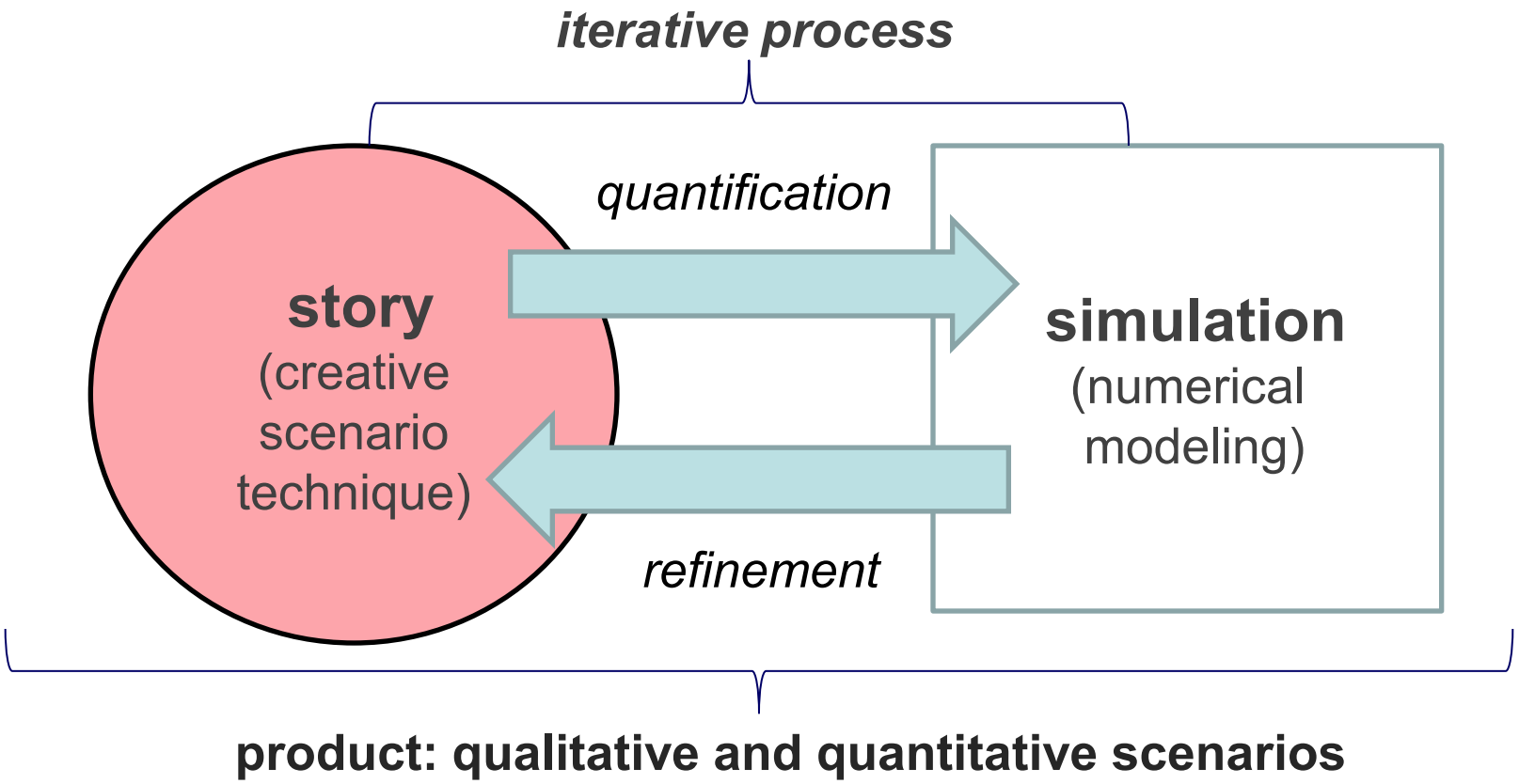
SAS: ideal type



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Source: own representation based on Alcamo 2001, 2008

SAS: practice

prototype studies

- Emission Scenarios (SRES) (IPCC 2000)
- Millennium Ecosystem Assessment (MA) (Carpenter et al. 2005)
- World Water Visions (Gallopin/ Rijsbersman 2000)
- Global Environmental Outlook GEO-4 (UNEP 2007)

➔ SAS covers a variety of designs combining numerical modeling with qualitative scenario techniques.

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SAS: strenghts

- use of **scenario concept** in its primary sense
- representation of **uncertainty** of social contexts
- integration of **qualitative** information
- inclusion of **variety** (of knowledge and of participants) possible

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SAS: weaknesses

- **methodological imbalance**: formal and systematic modeling vs. creative-narrative scenario technique
- ‘**promise of consistency**’ seems difficult to hold
- limited **reproducibility**
- ridden with **prerequisites**

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Cross-impact balance analysis (CIB) (Weimer-Jehle 2006)

- qualitative but systematic form of systems analysis
- based on expert judgments of interactions of system elements
- balance algorithm to determine consistent network configurations
- applied as qualitative scenario technique in various fields
- analysis via *SzenarioWizard* or with pen and paper

Example of a CIB matrix

	G			FP			EP			DW		S	
	p	e	s	cp	ri	cf	de	st	dy	ba	co	sp	te
government (G)													
-"patriotic" (p)				-2	1	1	0	0	0	0	0	-2	1
-"economy first" (e)				2	1	-3	-2	-1	3	-2	2	0	0
-"social" (s)				0	0	0	0	2	-2	3	-3	2	-1
foreign policy (FP)													
-cooperation (cp)	0	0	0				-2	1	1	0	0	0	0
-rivalry (ri)	0	0	0				0	1	-1	0	0	1	0
-conflict (cf)	3	-1	-2				3	0	-3	0	0	3	-1
economic performance (EP)													
-decreasing (de)	2	1	-3	0	0	0				-2	2	-3	1
-stagnant (st)	-1	2	-1	0	0	0				0	0	0	0
-dynamic (dy)	0	0	0	0	0	0				-2	2	3	-1
distribution of wealth (DW)													
-balanced (ba)	0	0	0	0	0	0	0	0	0			3	-1
-important contrasts (co)	0	-3	3	0	0	0	0	0	0			-3	1
social cohesion (SC)													
-social peace (sp)	0	0	0	0	0	0	-2	-1	3	0	0		

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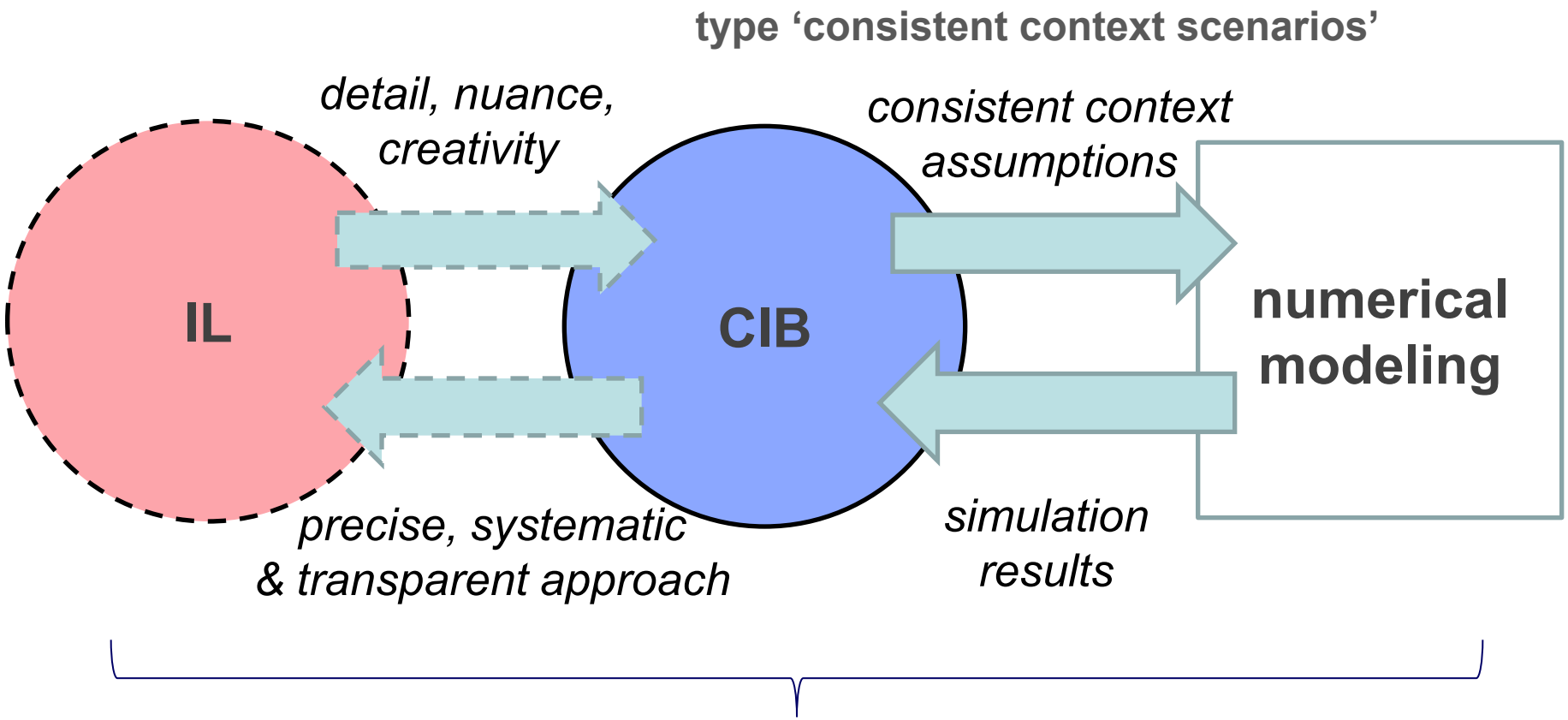
➔ **www.cross-impact.de**

Some conceptual ideas on ‘CIBAS‘

‘CIB instead or in addition to Intuitive Logics (IL)’



product: qualitative and quantitative scenarios

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CIBAS: expected potential

- **moderates the methodological imbalance** of SAS by its systematic and semi-formalized approach

- assures the **internal consistency** of the qualitative scenarios via CIB

- supports the **reproducibility** of the scenario process (*not* of the result) by explicitly documenting underlying mental models including assumptions on interrelations

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CIBAS: expected limits

- is **ridden with many of the same prerequisites** as SAS, the translation of verbal into numerical statements remains a challenge, e.g.

- possibly tends to **overemphasize causal relationships**

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Conclusion

CIBAS…

- could build on the strengths of SAS and balance some of its weaknesses
- might enhance the usefulness and the credibility of SAS processes

Future work

- develop a conceptual framework on SAS processes and variants
- explore CIBAS empirically: two case studies have already started

Ideas for further case studies are very welcome!

Thank you

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