TECHNISCHE UNIVERSITÄT DRESDEN

Kommission Wasserforschung

DFG

Fakultät Wirtschaftswissenschaften, Lehrstuhl für Betriebswirtschaftslehre, insb. Betriebliche Umweltökonomie

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AP:

DFG-Roundtable Discussion Dresden:
Scenarios – an interdisciplinary method used in water research
29th and 30th of June 2010

Scenarios – our picture of the future of water

Scenarios are used in various disciplines such as natural sciences, engineering or social sciences and therefore can be applied as a method to foster interdisciplinary collaboration in water research. However, there exists a wide range of different approaches to scenario development and use between the different communities. Moreover specialists for scenario development continuously refine the method itself. Nevertheless, there is still no theory about scenario planning. Martelli (2001) even calls the current state-of-the-art a “methodological chaos”. This situation motivated the DFG-Senate Commission on Water Research (http://www.dfgwasserkommission.de) to organize an interdisciplinary roundtable discussion on “Scenarios – an interdisciplinary method used in water research” on an international level in June of 2010.

Aim of the Roundtable Discussion

The aim of the roundtable discussion was to merge the knowledge on scenario use and development by the different disciplines in engineering, natural and social science, in order to develop a common understanding for the interdisciplinary method scenario and foster interdisciplinary and international collaboration.

Content of the Roundtable Discussion

1. Timetable

Day 1: 29th June 2010	
Prof. R. Helmig	Welcome address to "Scenarios - an interdisciplinary method used in water research"
Session 1: Key Note Lectures - Status Quo of Scenarios within disciplines	
Prof. A. Marcus	Economics and Management: “Strategic Foresight – A new look at scenarios”
Prof. P. Bishop	Social Sciences: “Scenarios – a roundtable discussion”
Prof. N. van de Giesen	Natural Sciences: “Scenarios: Physical science perspective”
Prof. W. Gujer	Engineering: „Scenario Development for urban Water Management: The future is unknown“
Session 2: Disciplinary Workgroups - Status Quo & Future need (DQ)	
Prof. C. von Hirschhausen	Economics & Management
S. Langsdale	Social Sciences
Prof. P. Döll	Natural Sciences
Prof. J. Lund	Engineering
Summary of Day 1	
Day 2: 30th June 2010	
Prof. E. Günther	Key questions of the 1st day & Goals of 2nd day
Session 4: Interdisciplinary Workgroups (IQ)	
Prof. P. Krebs	Urban Water and Infrastructure
Prof. J. Schanze	Floods and Droughts
Prof. E. Günther	Water Scarcity
Dr. S. Liehr	River Basin Management
Closing remarks	
Prof. E. Günther	Closing remarks: future road map

Please click on the links to download the presentations.
Username: **scenarios10**
Password: **dresden10**

2. Key Note Presentations

Short summary of the presentations:

Alfred Marcus, a professor of strategy at the University of Minnesota, stresses the importance of scenarios to anticipate future developments and to respond to them. Stories might help to imagine the future. Three generic types from theater might help to envision the future in light of all uncertainties: romance (What desire?), tragedy (What fear?) and comedy (What actually may take place?). It is best to think in three scenarios, a middle world embraced by the worst and the best future story. Five strategies might help businesses to probe the middle world: 1) gamble on “most probable”, 2) take “robust” route, 3) delay until further clarity, 4) commit with fallbacks and 5) shape future. Overall weak or ambiguous signals from peripheries should be carefully analysed, as problems or opportunities often arise from them.

Peter Bishop, a professor of future studies at the University of Houston, differentiated traditional forecasting and strategic foresight. He stressed the differences between research in physical science (physical evidence, strong assumptions, unitary phenomenon, higher quality inferences) and social science (intangible evidence, weak assumptions, multiple possibilities, lower quality inferences). He stated that change is anticipated often as follows: projections (forecasts made by others), plans (announced intentions and actions by influential stakeholders), trends (continuous change in same direction over long period of time), cycles (periodic events or reversals), constants (not expected to change before the time horizon) and expected future and implications (the likely future if nothing unexpected occurs). The key mechanism of change as he recommended are trend reversals (counter-trend, disruption), unfulfilled plans (key stakeholder does not complete its plan), potential events (surprises, unexpected developments), unresolved issues, decisions to be made (intentional branching points), leading indicators (changes that suggest that a specific scenario is coming about or not), alternative Futures and Implications (plausible scenarios, what may happen), novel ideas, proposals, weak signals (other things that could change the future). Scenario is not a technique, but rather a foresight of a future development.

Nick van de Giesen, a professor of Water Resources Management at Delft University of Technology linked climate scenarios and water resources management by asking the question: How much more rain will global warming bring? Estimated by the Clausius-Clapeyron formula it will be 7% whereas the GRL published a 23% increase of global average precipitation increase. GCM are commonly developed for temperature projection, although including rain, this is not the models focus. It is therefore important to use the right models to predict specific parameters correctly. The effects will differ on a regional level and over the seasons. Referring to the IPCC, AR4, WG II, Ch. 3: “[…] quantitative projections of changes in precipitation, river flows, and water levels at the river-basin scale remain uncertain (very high confidence)”. In the second part of his talk he stressed the relevance of decision support tools and the necessity for cooperation between the different disciplines. In order to meet the challenge of too many futures ((multi-)objective function, external forcing / boundary conditions, constraints / institutions) Nick van de Giesen suggested using a Full Bayesian Integration scheme in decision-support systems.

Willi Gujer, a professor of environmental engineering presented possibilities of scenario development for urban water management. His definition of scenario is: a story about what happen**ed** in the future. Starting with a story, which happened in the past, the case of the wastewater treatment plant of the City of Zurich, he concluded: Society changes rapidly, technology evolves rapidly, legal requirements evolve rapidly, economic conditions change rapidly, political / institutional conditions change rapidly and the catchment area changes rapidly. Furthermore he presented a task for planning: changes in the environment are foreseeable, if the increase of our uncertainty about the future is slow relative to the timescale of the consequences of our decisions. Consequently the degrees of freedom have

to be considered for planning, as well as the effort to characterize the future uncertainty. If both are high, he recommended a multidisciplinary scenario analysis. His final message could be the conclusion for the roundtable discussion in general: 1) scenario development and analysis support decision making under uncertainty; 2) with scenarios we try to expand the time horizon of our foresight; 3) proven concepts for scenario development exist. They result in scenarios, which are specific for the decisions to be taken; 4) scenarios open our mind and lead to a more integrated view of things; and 5) valuable scenarios result from transdisciplinary processes.

3. Group Discussions

The results of the following group discussions were documented on flipcharts and can be downloaded here:

http://www.dfg-wasserkommission.de/index.php?menue=5&module=download&file=scenarios

Results of the roundtable discussion

The key note presentations as well as the group discussions and the follow-up meeting of the organization committee showed, that the perspective on the topic is very different between the different disciplines, but also within disciplines. For this reason and because of the importance of long-term thinking for the future of our planet, we decided to continue our work on the topic in the following areas.

1. Urban Water and Infrastructure
2. Floods and Droughts
3. Water Scarcity
4. River basin Management

Future Steps

1. Global Scenario Network

The participants of the roundtable discussion encouraged the organizers to continue the dialogue. A Global Scenario Network will be founded. A communication platform, which was proposed by the participants, will be part of the network. The platform will be available soon under the following address http://www.globalscenarionetwork.org/

The platform shall focus on interdisciplinary methods of scenarios and enable researchers to connect. Even if a transfer into practice shall be fostered, the discussion shall be methodological and scientific. Assistance to user shall be provided, capacity building is supported for teaching and research.

The next steps to establish the platform, we ask all participants to contribute:

- definitions of scenarios (we start with the definitions given by the participants),
- literature (to develop the platform into a file archive), and
- best practice examples.

2. *Future Meetings*

- August 2011: Academy of Management: Professional Development Workshop on scenarios for businesses
- 2011/12 summer school for young researchers
- 2011/12 certificate workshop "Foresight Studies" by Peter Bishop
- 2011/12 roundtable discussion to design the Global Scenario Network in detail (board, conference planning etc.)
- 2012 Water Day (http://www.water.sc/) in Dresden, special topic scenarios
- 2012 international conference (one focus: benchmark study)

3. *Planned publications*

- technical notes won´t be published as planned, as the participants recommended to inform less on the content and more on the initiative as such
- 2013 handbook (Wiley) http://onlinelibrary.wiley.com/book/10.1002/0471264385) based on the international conference

4. *Possible projects*

- EU-framework programme
- Benchmarking-study as proposed by Willi Gujer: same data, different methods

The organization committee:
W. Aeschbach-Hertig, E. Günther, S. Liehr, M. Nowack, J. Schanze, U. Weber, R. Enzenhöfer