Plenary I: Evidence and Science
The “Great Transformation” of Science

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Overview

- From the societal “Great Transformation” to the “Great Transformation” of science
- Deficits of the science system regarding sustainability challenges
- Expectations from a transformative research
- The new science – society contract as an institutional challenge
Flagship Report

World in Transition
A Social Contract for Sustainability

Quelle: Rockström et al. 2009
Vision 2050:
Prosperity for 9 billion people within the planetary boundaries

Source: Schneidewind 2012
Drivers for the Great Transformation
Four motors for Sustainability Transitions

Infrastructure/ Technologies
Capital/ Financing
Policies/ Institutions
Culture/ Lifestyles

Source: Schneidewind 2012
Consequences for a “Future Earth” - Science
Understanding the Transformation

transformation research (Tr)

transformative research (tR)

Source: WBGU (2011): 352
Understanding Transformation: The Role of Science
The Transition Cycle as Framework for Transition Research

Source: Following Loorbach 2007
System Analysis, Scenarios, Experiments, Diffusion
Applying transformation science

Technological System Analysis

Technological Scenario Analysis

Technological Diffusion Analysis

Infrastructure/Technologies

Source: Schneidewind 2012
System Analysis, Scenarios, Experiments, Diffusion
Applying transformation science

Macro-Economic Models
Business Model Analysis

Financial Market Reforms

Capital/Financing

Problem Analysis
Vision Development

System Knowledge
Target Knowledge

Transformation Knowledge
Learning & Upscaling

Experiments

Alternative Welfare Indicators

Local Money Micro Credits Sustainable Business Models

Source: Schneidewind 2012
System Analysis, Scenarios, Experiments, Diffusion
Applying transformation science

Culture-/Milieu-Analysis

New Culture Movements

Culture/Lifestyles

Problem Analysis

Vision Development

System Knowledge

Target Knowledge

Transformation Knowledge

Learning & Upscaling

Experiments

New value based narratives

Transition Towns Culture Experiments

Source: Schneidewind 2012
System Analysis, Scenarios, Experiments, Diffusion
Applying transformation science

Policy Analysis
Political Network Analysis

Problem Analysis
Vision Development

System Knowledge
Target Knowledge

Policies/Institutions

Learning & Upscaling
Transformation Knowledge

Technological Diffusion Analysis

Political Experiments on international, national, regional and local levels

Theory of Democracy

Source: Schneidewind 2012
System Analysis, Scenarios, Experiments, Diffusion
Applying transformation science
System Analysis, Scenarios, Experiments, Diffusion
Applying transformation science
Consequences for a “Future Earth” - Science
Understanding the Transformation

Experimental Turn of Science

transformation research (Tr)

transformative research (tR)

Source: WBGU (2011): 352
Expectations from a transformative research
Socially robust knowledge and integration of civil society

- "Socially robust knowledge" =) integration of target-, transformation- and system knowledge
- Integration of civil society ("Co-Design" and "Co-Production" of research processes)
- "Disciplined Interdisciplinarity in transdisciplinary processes" (Scholz 2011)
- Real word laboratories (Groß u.a.)

=) Mode 2 – Science (Nowotny)
Deficits of the science system regarding sustainability challenges
Still a long way to transdisciplinarity

- Mainly **disciplinary driven** research
- **Technological bias** of the research
- Science as **system analysis**, not a catalyst for transformation
  (predominance of system knowledge over target and transformation knowledge)
Established set of transdisciplinary methodologies
There is no method barrier
The great transformation of science
New science – society contract: an institutional challenge

- Overcoming disciplinary **university structures** and cultures
- Changing **funding programmes** and regimes
- Strengthening **transdisciplinary career** paths for young scientists
- **Capacity building within civil society** for knowledge co-design and co-production processes
Landscape, regime and niches in the German science system

Understanding science system transformation

Source: Schneidewind/Augenstein 2012
What is needed next?
Important milestones for a great transformation of science

- Intensified **involvement of civil society** in science policy
- **Students and study programmes** as change agents for a transdisciplinary science
- More courage to **political experiments**
- More **transdisciplinary structures**
  - transdisciplinary faculties
  - centers for transdisciplinary methods
  - establishment of real world laboratories

=> IHDP and “Future Earth” as change agents
Thank you for your attention!

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Back-Up
Rockström et al. 2009:
Planetary boundaries under pressure
Transdisciplinary co-production of knowledge
Combining scientific and societal impact

Societal Problems
Contested values, lack of orientation and transformation knowledge, institutional specialisation, limits to knowledge transfer...

Societal Discourse
Administration, institutions, NGOs, corporations, political sphere...

Results for Societal Praxis
Strategies, concepts, measures, prototypes, technologies...

Formation of a Common Research Object
Problem Transformation

Scientific Problems
Contested knowledge, lack of (system) knowledge and methods, disciplinary specialisation, limits to transfer of new knowledge...

Scientific Discourse
Institutions of higher education, non-university research facilities, industrial research...

Production of New Knowledge
(Interdisciplinary Integration)

Transdisciplinary Integration
Evaluation of new knowledge for its contribution to societal and scientific progress

Results for Scientific Praxis
Methodical and theoretical innovations, new research questions...

Source: Jahn/Bergmann/Keil 2012: 5
System Analysis, Scenarios, Experiments, Diffusion

Applying transformation science
Map of national niche–strategies and coalitions for sustainability science
The example of the German science system

Source: Schneidewind/Augenstein 2012