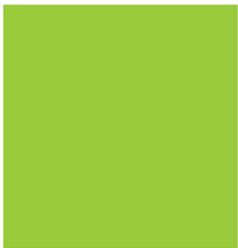
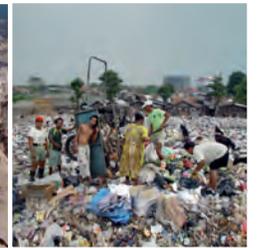




conference  
summary report

# German Future Earth Summit

27. / 28. Jan 2014  
Berlin



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summary report**

**German  
Future Earth  
Summit**

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German Committee  
Future Earth

## Preface

Human activities are altering the Earth system with significant impacts on the environment at the local, regional and global scale. Changes in the Earth's climate and loss of biodiversity are undermining improvements in human wellbeing and poverty alleviation. The challenge of achieving a transition to global sustainability is urgent given the potentially catastrophic and irreversible implications for human societies. On one hand, this is a threat to human prosperity on Earth, on the other hand, it provides incentives to exploit and develop new opportunities for innovation that supports sustainable development.

*Future Earth* is a 10-year international research programme launched in June 2012 at the UN Conference on Sustainable Development (Rio+20) that will provide critical knowledge required for societies to face the challenges posed by global environmental change and to identify opportunities for a transition to global sustainability.

*Future Earth* is sponsored by the Science and Technology Alliance for Global Sustainability. Its members consist of the International Council for Science (ICSU), the International Social Science Council (ISSC), the Belmont Forum of funding agencies, the United Nations Educational, Scientific, and Cultural Organization (UNESCO), the United Nations Environment Programme (UNEP), the United Nations University (UNU), and the World Meteorological Organization (WMO) as an observer.

*Future Earth* will answer fundamental questions about how and why the global environment is changing, what are likely future changes, what are the implications for human development and the diversity of life on Earth, and what the opportunities are to reduce risks and vulnerabilities, enhance resilience and innovation, and implement transformations to prosperous and equitable futures. Currently, *Future Earth* research is organized around three broad and integrated

research themes: “Dynamic Planet”, “Global Development”, and “Transformations Towards Sustainability”.

*“Future Earth Initial Design Report”. 2013.  
ISBN 978-0-930357-92-4*

To further develop *Future Earth* in Germany, the German Committee Future Earth (DKN Future Earth) held the first German Future Earth Summit in January 2014. The two-day programme included presentations, panel discussions and workshops. The overall aim was to initiate a dialogue on possible *Future Earth* research priorities from a German perspective. The summit also set out to foster interdisciplinary collaboration across the natural and social sciences, humanities, economics and engineering, as well as involve policy-makers, funding agencies, industry and other sectors of German civil society. It also provided opportunities to discuss possibilities for collaboration in cross-cutting *Future Earth* topics such as research methods and concepts, stakeholder involvement, environmental and societal data availability, potential contributions to the UN International Year for Global Understanding and the role of early career scientists.

The German Future Earth Summit was intended to be one of the steps towards the development of a national perspective and roadmap for *Future Earth* research.

The overwhelmingly positive response of the scientific community gives us confidence that Germany is and will remain a strong supporter of research on global sustainability.

This conference summary report was prepared by the DKN Future Earth Secretariat and is based on discussions between conference participants and contributions from the workshop organisers. <<



*Martin Visbeck*  
(Chairman DKN Future Earth)

*Bettina Schmalzbauer*  
(Scientific Secretary)

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## Executive Summary

Over 260 scientists attended the first German Future Earth Summit held in Berlin on the 27<sup>th</sup> and 28<sup>th</sup> January 2014. The conference was organised by the German Committee Future Earth and called on scientists and stakeholders to exchange their views and perspectives on the development of an effective research agenda that would address the many global and regional challenges faced by society today and in the future. The summit was intended to be one of the steps leading towards the development of a German perspective and roadmap for *Future Earth* research. Prior to the conference, the German Committee Future Earth invited the German scientific community to submit research topics related to the three broad international *Future Earth* themes. A total of 75 concepts (titles are listed in annex 1) were received and discussed during the summit.

The German Future Earth Summit opened with a general introduction to *Future Earth* international by Interim Future Earth Director Prof. Dr. Frans Berkhout with additional remarks from Prof. Dr. Martin Visbeck relating to the work of the German Committee Future Earth. A panel of experts expressed their views and expectations of a global research platform on sustainability. Panel members included: Prof. Dr. May-Britt Kallenrode, Prof. Dr. Karin Lochte, Prof. Dr. Uwe Schneidewind, Dr. Eberhard Faust, Prof. Dr. Dirk Messner and Dr. Ursula Fuentes Hutfilter.

In the afternoon, possible research foci for *Future Earth* were discussed in three workshops under the headings of the *Future Earth* programme's initial research areas: "Dynamic Planet", "Global Development" and "Transformation Towards Sustainability". The research topics discussed focused on sustainable use of natural resources, the impacts of extreme events, the role of system interfaces, sustainable global development, concepts and pathways of transformation as well as the role of individuals and actors in transformation processes.

After a short presentation of the key workshop outcomes, perspectives on *Future Earth* from research funders were given by Dr. Johannes Karte (German Research Foundation), Wilfried Kraus (German Ministry of Education and Research) and Kurt Vandenberghe (European Commission). In the afternoon, network meetings provided insights into integrated science with stakeholder involvement, defined the interests of early career scientists in *Future Earth* and facilitated the discussion on e-infrastructures and data management within the framework of a Belmont Forum initiative.

Overall, the discussions at the conference highlighted the need and willingness to integrate knowledge from different domains and disciplines in order to address the role of human activity in the "Anthropocene" and within the context of sustainable development. The complexity of the issues and breadth and scope of the research portfolio that needs to be implemented may well require new ways of doing science, including new innovative concepts that take environment, economy and society into account. <<





## 1 Future Earth: Introduction and panel discussion

Prof. Frans Berkhout presented his vision and the purpose of the international *Future Earth* initiative. The principal aim of the initiative is to develop the knowledge required to be able to respond effectively to the risks and opportunities of global environmental change and to support transformation towards global sustainability. Berkhout also explained that an international platform for global environmental change science is needed in order to be able to effectively deal with the epistemic fit, to leverage resources and to actively engage the natural sciences, social sciences, humanities and other sectors across the world in the search for solutions to global problems. Berkhout explained the added value of international collaboration using best-practice examples from core projects supported under the global environmental change programmes. Berkhout believes that *Future Earth* signals the birth of a new scientific era where the co-design and co-production of knowledge will contribute to achieving Sustainable Development Goals (SDG), carrying out ecosystem assessments such as IPBES and reaching new climate change agreements. Berkhout also introduced the Future Earth Scientific Committee and the Future Earth Interim Engagement Committee and their tasks and highlighted the initiative's efforts to build on the success of international global environmental change programmes (e.g. IHDP, IGBP and

DIVERSITAS), to engage all the existing projects of these programmes, to establish a permanent *Future Earth* Secretariat as well as completing and launching *Future Earth* research priorities in 2014.

Prof. Visbeck's talk focused on the goals and tasks of the newly established German Committee Future Earth whose members were appointed by the German Research Foundation in 2013. He pointed out that in Germany numerous research projects on global change and environmental issues already exist and were further developed by the former NKGCF (German National Committee on Global Change Research), to name but one example. The NKGCF initiated research projects and programmes addressing topics such as megacities, integrated water cycles, sustainable land management and climate engineering. Today, the interdisciplinary research community is well established and similar in size to the transdisciplinary research community. Visbeck went on to explain that although several German research programmes and research projects are already dealing with sustainability and environmental problems, the projects and project groups are nevertheless fragmented due to different funding opportunities, research scales and research priorities. He believes that *Future Earth* will facilitate coordination and international



collaboration through new alliances between researchers, scientific organisations and research users who will come together to co-design an integrated research agenda and co-produce knowledge for solutions applicable to the global community.

The German Committee Future Earth is tasked with the development of a scientific agenda on the national (and international) level, and the establishment of a forum that connects Germany's scientific community. The German Committee Future Earth will support the self-organising process of the German research community in its efforts to identify socially relevant research topics and to initiate flagship activities.

The panel discussion focused on the expectations of German research institutions, universities, the economy and politicians for a global coordinated platform in terms of sustainability research. The panel members included: Prof. Dr. May-Britt Kallenrode (Vice President for Research and Graduate Student Development, University of Osnabrück), Prof. Dr. Karin Lochte (Director Alfred Wegener Institute), Prof. Dr. Uwe Schneidewind (President Wuppertal Institute for Climate, Environment and Energy), Dr. Eberhard Faust (Head of Climate Risks and Natural

Hazards at Munich Re), Prof. Dr. Dirk Messner (Director German Development Institute) and Dr. Ursula Fuentes Hutfilter (Head of the Climate Policy Division of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety). The panel addressed the challenges of integrated research, especially in terms of education and career development, with a particular focus on the barriers faced by the social sciences and humanities, the lack of incentives for integrated research and appropriate funding structures and review procedures, the need for the involvement of non-scientific experts in the research process of integrated science as well as the challenges associated with this, and the need to involve basic research in *Future Earth* as it forms the basis for fundamental questions related to how the global environment is changing.

The panel members expressed their support for the conceptual idea and thematic priority of *Future Earth*, but also emphasised the need to improve cooperation possibilities between science and economy/politics/society, organisational structures (disciplinary vs. interdisciplinary) as well as funding schemes and review processes. <<

**Prof. Dr. May-Britt Kallenrode**  
(*Vice President for Research and Graduate Student Development, University of Osnabrück*)



» Universities are in an excellent position to focus on *Future Earth* activities. Their broad range of subjects, ranging from the natural and engineering sciences to the humanities and social sciences, lays the foundation for trans- and interdisciplinary research. Moreover, their close integration in society is the basis for applied and accompanying research. However, universities also have problems with the sustainability of sustainability research; career perspectives and assessment standards of up-and-coming scientists need to be tailored to the complexity of research topics in order to inspire brilliant, curious researchers to enter this field of study. «

**Prof. Dr. Karin Lochte**  
(*Director Alfred Wegener Institute*)



» The global challenges require global efforts in science. *Future Earth* is the right approach to tackle these challenges in interdisciplinary and international collaboration. The most important step in the future development of *Future Earth* is linking the science with the needs of society. «

**Prof. Dr. Uwe Schneidewind**  
(*President Wuppertal Institute for Climate, Environment and Energy*)



» Challenges associated with co-designing and co-producing knowledge:

1. Methodological development: new ways of interdisciplinary modelling, working together in “living labs”, new languages.
2. Structural development: to improve interdisciplinary cooperation at universities, set up new research infrastructures e.g. “living labs”.
3. Civil society capacity building in order to put co-design and co-production into practice.
4. New research funding schemes to support items one to three (see also German agenda for setting up processes related to sustainable cities). «

## Dr. Eberhard Faust

*(Head of Climate Risks and Natural Hazards at Munich Re)*



» The improved cooperation between science and industry while respecting every partner's self-determination as represented by the programmatic keywords "co-design" and "co-production", is of huge importance for identifying and resolving scientific issues in the promotion of global

sustainable development. In this respect it is important to be aware right from the start of the partners' different institutional conditions such as different time horizons and the difference between epistemological risks and risks based on implementation choices. «

## Prof. Dr. Dirk Messner

*(Director German Development Institute)*



» Sustainability science requires massive interdisciplinary effort. However, incentive schemes for scientists, PhD programmes and university faculties still revolve around individual disciplines. Institutional reforms are therefore crucial for promoting

interdisciplinary cooperation. An in-depth knowledge of the methods used in various disciplines is a major driver of scientific innovations. «

## Dr. Ursula Fuentes-Hutfilter

*(Head of the Climate Policy Division of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety)*



» The BMUB very much welcomes the notion that future research activities will be co-designed and that cooperation between scientists, politicians, society and the economy reinforced in order tackle the societal challenges associated with the

necessary transition towards environmental/climate compatibility and sustainability. *Future Earth* has the potential to come up with groundbreaking research, but care must be taken to assess current opportunities and existing structures. The time factor is key, as the time available to make a successful transition is limited. «

# 2

## Workshops on Future Earth research topics

An open call for the submission of concepts for *Future Earth* research topics was published prior to the conference with the goal of getting an overview of the interests of German researchers. Around 75 concepts were submitted, ranging from topics involving individual disciplines to those that brought together partners from different disciplines. These concepts formed the basis for the discussions in the three workshops focusing on the *Future Earth* themes "Dynamic Planet", "Global Development" and "Transformation Towards Sustainability":

**Dynamic Planet:** Gaining insights into how the Earth is changing due to natural phenomena and human activities. The emphasis will be on observing, explaining, understanding and projecting Earth, environmental and societal system trends, drivers and processes and their interactions, as well as anticipating global thresholds and risks. Building on existing knowledge, there will be a particular focus on interactions between social and environmental changes across scales.

**Global Development:** Providing the knowledge for addressing the most pressing needs of humanity including sustainable, secure and fair stewardship of food, water, biodiversity, energy, materials, and other ecosystem functions and services. The emphasis of this *Future Earth* research theme will be on understanding the impacts of human activities and environmental change on the health and well-being of people and societies and on the interactions of global environmental change and development.

### ✿ Transformation Towards Sustainability:

Understanding transformation processes and options, assessing how these relate to human values and behaviour, emerging technologies, and economic development pathways, and evaluating strategies for governing and managing the global environment across sectors and scales. The emphasis of *Future Earth* research will be on solution-oriented science that enables fundamental societal transitions to global sustainability. It will explore the institutional, economic, social, technological and behavioural changes that can enable effective steps towards global sustainability and how these changes might best be implemented.

The major objective of the workshops was to discuss research interests related to the research topics and to facilitate the development of *Future Earth*. The conclusions drawn from the workshops (see section 2.1 to 2.3) were presented to the conference participants on Tuesday morning. Amongst other things, the plenum discussed the role of basic research in *Future Earth* and the need to consider basic research from within the context of *Future Earth*, how basic research in the humanities can contribute to *Future Earth*, the need for well recognised communicators/scientists who are able to bring *Future Earth* into all disciplines, and the increasing awareness of scientists of the central role of people in the Earth System.

The participants made numerous suggestions as to how the challenge of integration could be tackled and agreed that the social sciences will need to be instrumental in integrated research aimed at achieving global sustainability. It was also emphasised that focusing on environmental issues in the social sciences is not currently a recognised career path, and this presents a challenge in itself.

As *future studies* work with modelling approaches it was suggested that this could be a branch of the social sciences that could be included in integrated research very easily. Some participants felt that the ISSC report on “Transformative Cornerstones” would be an excellent starting point for identifying integrated research priorities and initiating the first flagship activities.

The following conclusions can be drawn from the discussions: First, knowledge from different domains and disciplines needs to be integrated in order to address and understand the role of human activity in the “Anthropocene”. Second, the social sciences play a crucial role in addressing the many challenges that will occur on the move towards a sustainable society. And third, the development of new pathways for global sustainability requires a new way of doing research, including new concepts, i.e. research that not only takes into account ecological and economic issues, but to a greater extent all sections of society (e.g. political decisions, social issues). <<





**Organisers:** Prof. Dr. Christoph Garbe (University of Heidelberg/SOLAS), Dr. Mark Gessner (Leibniz-Institute of Freshwater Ecology and Inland Fisheries/freshwater biodiversity), Prof. Dr. Patrick Hostert (Humboldt-Universität zu Berlin/GLP), Prof. Dr. Martin Visbeck (GEOMAR Helmholtz Centre for Ocean Research Kiel/DKN Future Earth), Prof. Dr. Volkmar Wolters (Justus Liebig University Giessen/DKN Future Earth).

**T**wenty-three concepts were submitted to the Dynamic Planet workshop and discussed by around 50 participants. The concepts proposed and subsequent discussions focused mainly on the following topics:

- ✿ **Sustainable use of natural resources** (land and water systems) in the face of future trends in nature and society (e.g. demography, lifestyles, climate change).
- ✿ **Impacts of extreme events from a social perspective** (e.g. civil wars) and a natural systems perspective (e.g. natural hazards).
- ✿ **System interfaces:** spatial aspects (e.g. coastal systems, land-atmosphere interface) or systemic aspects (e.g. land use including biodiversity).

It was argued that discussions on land issues need to become more open and need to be approached in a more comprehensive, systematic way (e.g. sustainable resource management), and that regime shifts (caused by the impact of extreme events) and hotspots of unique complex systems need to be considered alongside system interfaces. It was also noted that research concepts such as the planetary boundaries concept have to be revised in the *Future Earth* context (see also conclusions from the World Café in section 4.4).

The workshop participants agreed that it was necessary to improve cooperation between different disciplines (natural sciences, social sciences, humanities), including the integration of descriptive and normative dimensions as well as social, cultural and natural linkages. “Regional realities” was recognised as an important item for

solving global problems within *Future Earth*, as well as the linkage between the regional/local and the global level. Participants agreed that stakeholder involvement in the research process was necessary from the very outset. Nevertheless it was recognised that broader stakeholder involvement processes must be based on a concrete research idea. Great importance was attached to:

- ✿ Development of research methods and concepts in addition to research topics.
- ✿ The detailed understanding of social aspects on a regional level.
- ✿ Socio-ecological novelties that deal with unpredictable system changes.
- ✿ Cross-system approaches (e.g. including different sub-systems such as land-ocean, social-natural, etc).
- ✿ Impact on different sub-systems (e.g. biodiversity, climate, governance, human well-being).
- ✿ The need for multi-scale approaches (e.g. time, space).
- ✿ Methods that take into account the disparity and inhomogeneity in individual/local communities (e.g. using multi-model approaches).

*Future Earth* methods were also discussed in the World Café (see section 4.4), where workshop participants recognised the crucial role of seed money for transdisciplinary research. They also suggested the establishment of platforms that provide broad access to research methods and concepts (e.g. “Werkstatt Wissenschaft”). <<



**Organisers:** Prof. Dr. Almut Arneth (Karlsruhe Institute of Technology/AIMES), Prof. Dr. Dagmar Haase (Helmholtz Centre for Environmental Research, UFZ/UGEC), Prof. Dr. Wolfgang Lucht (Potsdam Institute for Climate Impact Research/DKN Future Earth), Prof. Dr. Christiane Schmullius (Friedrich Schiller University Jena/DKN Future Earth).

## 2.2 Summary of Global Development workshop

The Global Development workshop opened with Guido Schmidt-Traub (UN Sustainable Development Solution Network/Future Earth Interim Engagement Committee) giving a short summary of Sustainable Development Goals. The workshop featured 19 concepts, attracted 60 participants and led to a constructive discussion of the challenges posed by “new” and “solution-based” research.

The majority of the 19 concepts addressed research topics and methods. The workshop organisers grouped the concepts into three main categories: first, normative approaches that focused on planetary and regional boundaries, second, regional approaches that focused on analytical components (e.g. global patterns with regional components, production and consumption patterns), and third, temporal approaches combined with different worldviews (e.g. human behaviour vs. decision-making). The workshop participants suggested that the *Future Earth* research activities relating to global development could be best grouped into the following three categories:

### 1) Transformation pathways

- ☀ Development within planetary and regional boundaries (i.e. sustainable development).
- ☀ Emerging (new) social, industrial and information infrastructures.
- ☀ Temporal trajectories of development, differences in worldviews.

### 2) Ecological services

- ☀ Global patterns and their governance, case studies/case problems, teleconnections.
- ☀ Shifts in institutional, production and consumption patterns.
- ☀ Water, food, land-use change, urbanisation, air quality, multifunctional landscapes.

### 3) Basic social science research with regard to global development

- ☀ Fairness and distribution, political economy of change, human behaviour, knowledge and innovation. ‹‹



## 2.3 Summary of Transformation Towards Sustainability workshop



**Organisers:** Prof. Dr. Ilan Chabay (Institute for Advanced Sustainability Studies/IHDP), PD Dr. Marion Glaser (Leibniz Centre for Tropical Marine Ecology/ LOICZ), Dr. Thorsten Grothmann (Carl von Ossietzky University of Oldenburg), Dr. Jochen Hinkel (Global Climate Forum e.V.), Prof. Dr. Karen Pittel (ifo Institute/DKN Future Earth).

The workshop on Transformation Towards Sustainability attracted great interest. 95 scientists participated in the discussions and 35 concepts on potential research topics were submitted. The concepts were grouped into three general topics and discussed in different breakout groups:

- I. The role of individuals in the transformation process: social and psychological studies of human-ecosystem interdependence and on how human behaviour can be changed accordingly.
- II. The role of collective action and institutions in the transformation process: political, economic, institutional studies of governance at multiple scales/levels.
- III. How to undertake transformation research:
  - a) How to design scenarios, models and narratives.
  - b) How to design solution-oriented empirical research: action research, participation, science-policy interaction, case studies, monitoring and evaluation.

Due to time constraints, the discussions had to be restricted to more or less general statements. The following research topics were identified:

### **Research topics relating to the role of individuals in the transformation process:**

- ✿ How and when does the self-interested individual turn into a collective actor? How relevant are social identity, (new/local) social norms and collective efficacy in this respect?
- ✿ Which role does local context play in promoting or hindering decisions for sustainable actions?
- ✿ What are positive incentives (e.g. positive narratives) of sustainable actions and how can these be further enhanced and how can new ones be catalyzed?

**Research topics relating to the role of collective action and institutions in the transformation process:**

- ✿ Under which key conditions (e.g. knowledge, mechanisms) do individual and collective governance actors, processes and structures drive transformative change (e.g. tipping points, solutions) efficiently, effectively and legitimately towards the resolution of collective action problems/conflicts in the area of sustainable development?

**Research topics relating to the methodological design of transformation research:**

- ✿ To whom is our research addressed?
- ✿ Who wants to learn and how do they want to learn, who wants to know?
- ✿ What variety of methods and different ways of didactical and communication methods are needed for different types of stakeholders?
- ✿ How to deal creatively with conflicts between different interest groups?
- ✿ How to establish an authentic vision? Could the development of visions be an effective answer to avoid or resolve conflicts?  
What are potentially useful methodological reference frameworks for carrying out and assessing trans- and interdisciplinary, solution-oriented transformation research?  
*To answer this question the following “sub-questions” were developed:*
  - What lessons have been learnt about useful reference frameworks from previous and ongoing trans- and interdisciplinary, solution-oriented research projects?
  - How can existing methodological standards from different disciplines be integrated into trans- and interdisciplinary, solution-oriented research?

“Useful methodological reference frameworks” in this context mainly referred to methodological *process quality standards*, e.g. ways to involve stakeholders in a scientifically sound manner. They were not intended to be outcome quality standards, e.g. number of stakeholders involved. It was stressed that the aim should not be to develop just one single methodological reference framework for all types of trans- and interdisciplinary, solution-oriented transformation research. Instead, a number of different reference frameworks for different types of transformation research were recommended. Establishing such methodological reference frameworks was identified as an issue requiring rapid agreement; therefore the recommendation was that it should be addressed within a Future Earth Fast Track Initiative. <<

# 3

## Future Earth research funding opportunities

While *Future Earth* is a framework programme with the principal goal of promoting and coordinating research on global sustainability on an international level, individual *Future Earth* research projects will mainly be funded by national research funding organisations. This section outlines the funding opportunities provided by the German Research Foundation (DFG), the Belmont Forum, the German Ministry of Education and Research (BMBF) and the European Commission (EC).

Dr. Johannes Karte (Programme Director and Coordinator for Environment at DFG) highlighted in his talk the different stages of the *Future Earth* knowledge generation process and explained that specific DFG funding is available for the different process stages (see Figure below). He explained that the Belmont Forum provides multilateral funding opportunities. The Belmont Forum is an international cooperation of national funding agencies that provide funding to international partnerships of social and natural scientists working on e.g. freshwater security and coastal vulnerability. Joint research calls that will bring together international partnerships on other research topics are currently at the preparation stage.

Wilfried Kraus (Director General of the BMBF directorate for Sustainability, Climate and Energy) highlighted some of the major challenges faced by Germany and all other countries of the world: changes in energy use, changes in climate and limited resources. He also focused on solutions being sought by German researchers. In addition, he gave an overview of the BMBF's research funding criteria and important structural features intended as guidance for further work within *Future Earth*. Kraus explained that the BMBF attaches great importance to the collaboration between German scientists and researchers in Europe and the rest of the world and that the BMBF's Framework Programme "Research for Sustainable Development (FONA)" and Joint Programming Initiatives (JPIs) could be key sustainability research funding tools. In addition, Kraus highlighted the importance of dialogue and co-operation between research and stakeholders. He regards *Future Earth* as a strategic springboard for current and impending international societal challenges that could be used to orient national research programmes worldwide. Kraus finally underlined the importance of global capacity building within *Future Earth*, and supported the idea that *Future Earth* research needs to be

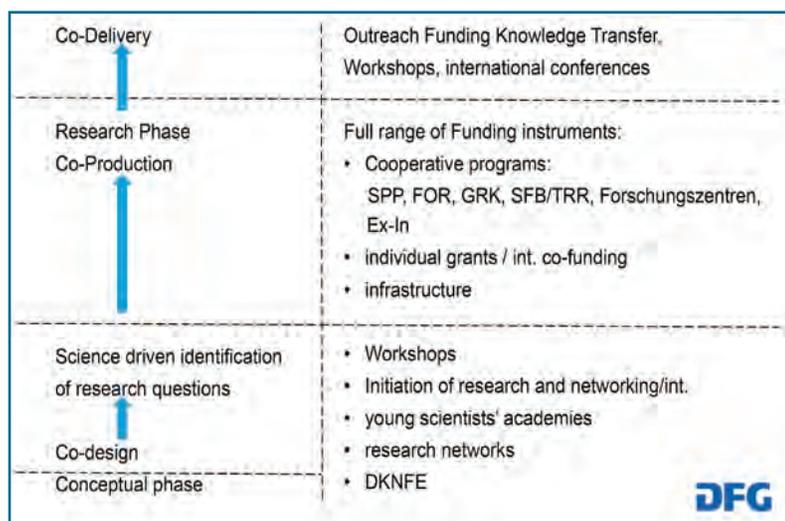


Fig. 1: *Future Earth* knowledge production process and DFG funding options



structured according to programmatic priorities, but also needs to take into account specific (regional/local) solutions.

Kurt Vandenberghe (European Commission, Director Environment DG Research and Innovation) reported on possible links between *Future Earth* and Horizon 2020 research funding. Both programmes have introduced specific measures to promote excellence and broaden participation of natural scientists and social scientists. Both programmes have also adopted a challenge- and solution-oriented approach for solving societal challenges of the future, and both focus on interdisciplinary and transdisciplinary research in order to develop business models for the future and for societal innovations, to name but one example. In addition, both programmes are being developed in such a way as to build global confidence in the knowledge acquired during the transition to global sustainability. «

**Dr. Johannes Karte**  
*(Programme Director and Coordinator  
 for Environment at DFG)*

» *Future Earth* is a challenging and inspiring new platform for international and integrated research on global change and sustainability. Deutsche Forschungsgemeinschaft offers a broad portfolio of funding opportunities to support research within this framework and encourages the scientific community to develop innovative research initiatives contributing to *Future Earth*. «

**Wilfried Kraus**  
*(Director General of the BMBF directorate for  
 Sustainability, Climate and Energy)*

» BMBF appreciates in particular the ambition of *Future Earth* to enhance the dialogue and cooperation between science and stakeholders from society, private sector and politics. This is an important pre-condition to increase relevance and usability of research results. «

**Kurt Vandenberghe**  
*(Director Environment DG Research and  
 Innovation of European Commission)*

» Both *Future Earth* and Horizon 2020 are being developed to build global confidence in the knowledge acquired during the transition to global sustainability. «

# 4

## Network meetings



### 4.1 Global data management and e-infrastructures

**Organisers:** PD Dr. Birgit Gemeinholzer, Justus Liebig University Giessen; Dr. Christoph Waldmann, MARUM University of Bremen.

The German representatives of the international scientific “Global Data Management and e-infrastructures” steering committee of the Belmont Forum were available for discussing issues related to data availability and exploitation. Issues raised in the context of the design of global e-infrastructures was the need to take into account the requirements of scientists involved in integrative research such as planned for *Future Earth*. The suggestions and concepts of the workshop participants can be summarised as follows:

- Need to optimise the organisation of data discovery and access.
  - Social science data are acquired differently from environmental data – *Future Earth* research needs to explore new concepts in order to be able to turn data and information into knowledge.
  - Interoperability is also an organisational problem → *Future Earth* offers a platform for addressing this problem.
  - Data must be traceable and trustworthy.
  - Data and information are needed for tackling big problems → *Future Earth* might contribute to increasing motivation.
  - *Future Earth* requires data that cover large geographical areas or have a wide temporal dimension.
- Using existing infrastructures as integration platforms.
  - GEO/GEOSS (or potentially organisations on a smaller scale that support GEOSS).
  - INSPIRE.
  - Existing infrastructures must be identifiable and made known to all involved (e.g. expansion of the website [resources.dfg.de](http://resources.dfg.de)).
- Adopting an unconventional way of thinking.
  - Using concepts and ideas from the private sector without creating dependence.
  - Private sector needs to see a win-win situation to become an active contributor.
- Need to generate trust & purpose.
  - Using “best-practice” examples to generate acceptance, guarantee targeted data availability (linking the goals of science with those of society).
- Strengthening social science infrastructures and establishing national research infrastructures. <<

## 4.2

### Integrated research “lessons learned”: design of integrated research projects



**Organisers:** Prof. Dr. Birgit Blättel-Mink, Goethe University Frankfurt; Prof. Dr. Wolfram Mauser, Ludwig Maximilian University of Munich; Prof. Dr. Armin Grunwald, Karlsruhe Institute of Technology; Dr. Antonietta Di Giulio, University of Bern; Prof. Dr. Ralf Seppelt, Helmholtz Centre for Environmental Research – UFZ.

The main objective of the workshop was to exchange experiences on and learn from the daily practice of interdisciplinary and transdisciplinary research projects and to exchange experiences on how to set up integrated projects and programmes. Moderated by Prof. Dr. Blättel-Mink and based on statements from Prof. Dr. Wolfram Mauser, Prof. Dr. Armin Grunwald, Dr. Antonietta Di Giulio and Prof. Dr. Ralf Seppelt, workshop participants discussed their experiences. One of the diverse issues raised was the involvement of stakeholders. The following questions were discussed:

- When does it make sense to include stakeholders and in what cases would it be better to involve other groups than stakeholders? What other groups outside academia have to be identified with regard to transdisciplinary research?
  - Should they be involved from the very beginning, only at the end, at fixed points in a project? The workshop participants discussed the pros and cons of stakeholder involvement and the involvement of other non-academic groups at these different stages of a project.
- How is a stakeholder defined?
  - As collective or individual actor (e.g. corporate representative or concerned private consumer), as expert or non-expert (e.g. representative of trade union or employee of a retail company)?
  - Are private stakeholders exclusively lead-users (people enthusiastic about the development of specific topics/technologies, members of highly educated populations) or also non lead-users (e.g. women; social groups with lower levels of education).

- What is the stakeholders' role in the research process? How much does this depend on the stakeholders' background (e.g. with regard to the level of education)?

The discussion of the workshop participants also focused on the “science-society division”, including a discourse on the role of science in society, the rational of integrated research and the question as to who should be involved in the early development stages of a research programme. Gender-sensitive language was also criticised.

Ultimately, it is clear that the processes required to ensure the quality of integrative research are very challenging. Such processes do not just occur by themselves, and will not come about if all parties do not show good-will and determination. The success of process control in an inter- or transdisciplinary project does not depend on the solitary talent of a particularly charismatic genius. Of course, like any other research approach, creativity is required, but process control is first and foremost based on sound theoretical and methodological science, which can be learned. Inter- and transdisciplinary processes must be part of methodical research design and the realisation of processes needs to be reflected in budget planning and resource administration.

The workshop participants suggested the establishment of a mailing list in order to exchange information on literature that has been found to facilitate the design of transdisciplinary research. <<

# 4.3

## Early Career Scientists in Future Earth

The early career scientists network meeting attracted over 60 PhD students, post-docs and junior professors. The discussions centred mainly on (1) possible structures, incentives and the establishment of a German early career scientist Future Earth network, (2) the research priorities identified at the German Future Earth Summit, and (3) potential initial activities and flagship projects of the future German early career

- Pooling of current and planned research activities in a strategic-programmatic way.
- Integration of early career scientists in agenda setting and research in *Future Earth* (on a national and international level).
- Internationalisation: involvement of research activities in international networks.

**Organisers:** Prof. Dr. Antje Bruns, Humboldt-Universität zu Berlin; Prof. Dr. Daniel Lang, Leuphana University of Lüneburg; Dr. Simon Meisch, Eberhard Karls University of Tübingen; M.Sc. Moritz Remig, IASS Potsdam; Prof. Dr. Martin Wilmking, University of Greifswald.



scientist network. Finally, the participants showed great interest in joint *Future Earth* projects. The participants also concluded that the formal integration of an early career scientists network into the German Committee Future Earth structure would generate a number of mutual benefits. Expectations for such a possibility included:

- Improved information exchange on *Future Earth* (global and national activities).
- Increased knowledge about *Future Earth* research projects (in particular from and with early career scientists).
- Possibility for scientific exchange and discourse on inter- and transdisciplinary topics.
- Learning from each other: joint workshops, publications, research activities.

The early career scientists agreed to publish an open letter as one of the network's first activities. The open letter will be based on the draft version of "Open letter to *Future Earth* from young researchers" and will call for the greater integration of young scientists in the *Future Earth* processes (see also annex C). The participants agreed to address the open letter to the German Committee Future Earth and German research funding organisations (DFG, BMBF) and to submit it in March.

Possible other future activities might involve the further development of the German early career scientist network structure and associated self-organisation processes as well as the organisation of a workshop that focuses on the further development of methods in inter- and transdisciplinary sustainability research. <<



## 4.4

### Keywords collected

### during the World Café

### “Future Earth Markt der Ideen”

#### a) Future Earth research methods

Host: Prof. Dr. Anke Jentsch,  
University of Bayreuth

- Natural sciences methods are not sufficient to solve the CO2 problem.
  - Research on transformation in the Anthropocene.
  - Political conflict.
- Participation of all scientific disciplines required in order to develop responses to current societal challenges.
- New, adapted research concepts are required.
- All three research approaches are needed in *Future Earth*: without disciplinary research, there is no detailed knowledge; without interdisciplinary knowledge, there is no problem solving, without transdisciplinary research, there is no problem definition.
- Different concepts of transdisciplinarity have to be taken into account (“natural sciences and humanities” vs. “integration of society and problem-specific stakeholders”).
- Regional (continental) socio-ecological research is difficult and transfer to other regions is not possible.
  - A change in methodology is needed: depart from reproducible studies and focus on (multi)-regional studies.
- Large functional differences are also possible on small scales.
- Are archetypes of natural sciences transferable and/or extendable to socio-ecological research?
- Transdisciplinary coordination and synthesis of research are needed.

- Seed money for stakeholder involvement is needed (e.g. in budgets for transformation research).
- Project duration in *Future Earth* (extended).
- Multilateral research programmes (such as the Belmont Forum) that also include countries in the south need to be developed.
- In education, internationalisation already takes place (e. g. Erasmus).
- Research deficit: participation of stakeholders in early stages in order to inspire researchers for new research foci.
- The benefits of a platform such as “Zukunftswerkstatt für Wissenschaftler”.

#### b) Research concepts: planetary boundaries research - water, land use, ecosystems

Host: PD Dr. Dieter Gerten, Potsdam  
Institute for Climate Impact Research

#### Question 1: How can the planetary boundaries concept be improved and what are the new methods for exploring (water and land use) planetary boundaries?

- Water and land use: regional issues difficult to aggregate on a global level.
- Water quality also needs to be taken into account.
- Question of how to compensate (regional) exceedance of boundaries in other regions.
- Some weighting of regional exceedance (according to the regions’ global relevance) needed to determine the planetary boundary.

- Interdisciplinary work and interaction on planetary boundaries is key and also needs to involve the social sciences and the humanities.

#### Question 2: How should natural and social scientists cooperate to identify opportunities for staying within planetary boundaries?

- Many socio-ecological questions (e.g. distribution of resources, globalisation, definition of sustainability criteria).
- Relation between planetary boundaries and Sustainable Development Goals needs to be clarified and balanced.
- Definition and positioning of boundaries is a normative question.
- Cultural differentiation regarding definition of boundaries.
  - Need to develop social models coupled with natural sciences models.
- Research required on “green” development options in order to stay within boundaries (to oppose overexploitation of resources).
- If quantitative options (critical values) are defined to help to stay within planetary boundaries, who is responsible for implementation and which jurisdiction should be adopted (on a local to global level)?
- Adaptation of social systems with approaching system boundaries
  - Social tipping points may occur if local/global boundaries are transgressed.
  - Need to analyse the political implication of planetary boundaries.

- Discussion on planetary boundaries as a social process.
  - How to deal with uncertainty, tradeoffs, particularly on a local level.

### c) What are the options for involving social sciences and humanities in the integrated assessment of global sustainability problems?

Host: Prof. Dr. Karen Pittel, ifo Institute

#### Problems:

- Complexity of research: recognition of individual knowledge boundaries.
- Evaluation of research outputs by research funding and institutions.
- Prejudices caused to other disciplines; lack of respect.
- Time availability – time for projections/visions at the beginning and synthesis.
- Different languages, different study outlines.
- Relativisation of disciplinary research results.

#### Action:

- Integrated staffing policy (at universities and interdisciplinary institutes).
- Short distances: multi-disciplinary faculties.
- Extend the evaluation criteria for successful research.
- Interdisciplinary aspects in curricula.
- Demands need to be realistic.
- Training on interdisciplinary research and team building.
- Communication and information.

#### Doing research as part of Future Earth means:

- Space and time for discussions to understand each other.
- Centre of excellence for interdisciplinary research.
- Interdisciplinary “hubs” in disciplinary research landscape (not to forget interactions).

### d) How can stakeholder engagement in transdisciplinary research in Future Earth be improved?

Host: Prof. Dr. Ilan Chabay, Institute for Advanced Sustainability Studies

- Clear definition of goals.
- Developing goals (as part of a collaborative process).
- Pre-project funding (explorative phase).
- Action research (non-experts).
- How to reach all relevant stakeholders in a timely fashion?
- Explanation to the broader public as to why there is no alternative to including all relevant stakeholders (given the kind and magnitude of problems).
- Training scientists in stakeholder engagement.
- Taking into account stakeholders’ constraints, interests and benefits.
- Ensuring stakeholder follow-up.
- Assessing opportunity costs for stakeholders.
- Who and what are the relevant stakeholders?
- Who is to decide what is relevant?
- What criteria? How to select criteria?
- Clearly establishing the scientist’s role: a stakeholder in the process or an impartial (→ impossible) investigator?
- Process knowledge to be published too → incentives also in the natural sciences.
- Identification of stakeholder subgroups to develop group-specific strategies.
- Analysis of stakeholders satisfaction levels/motivations
- The democratic legitimacy of the stakeholder role.
- Danger of stakeholders “overpowering” untutored academic in transdisciplinary dialogue.

### e) How to improve data availability in Future Earth (global data management and e-infrastructures)?

Hosts: PD Dr. Birgit Gemeinholzer, Justus Liebig University of Giessen; Dr. Christoph Waldmann, MARUM University Bremen

- Putting in place a coordination or mediation mechanism, for instance by establishing a committee for coordinating data from different sources.
- Fusing socio-economic with natural

science data is still an unresolved issue

- Field study data (harvest).
- Gender data: case economy (distribution under what conditions, basis of comparison in relation to sustainable environment).
- Water utilisation data.
- Water quality data.
- Economic data (social science studies).
- Health data.
- Long-term national and international data preservation is crucial for Future Earth.
- Data quality and traceability has to be ensured.
- How to motivate and raise (financial) support for data collectors? (e. g. publications, money, research associations).
- Establishing a joint platform for research data is desirable.
- Data on socio-political information should be made available as geospatial information.
- Existing platforms and infrastructures need to be used more efficiently.
- Open access to all publically supported observation systems (DWD) should be provided.
- Public agencies request data exchange support (research on coastal zones).

### f) UN “International Year of Global Understanding” 2016: interdisciplinary networking

Host: Prof. Dr. Benno Werlen, Friedrich Schiller University of Jena

- Global transformation.
- Care economy.
- Gender – age diversity.
- Teleconnections.
- How can we change our behaviour? Breaking out of the comfort zone and from “business as usual” attitudes is a big problem.
- Household – locally – globally (gender).
- Grand/greater challenges of society.
- Video implementation?

*Global thinking and global action demand global understanding. This initiative by the International Geographical Union aims to bridge the awareness gap between local acts and global elects. It will do this through research, education and information.*



## 5 The Way Forward

The first German Future Earth Summit was an enormous success. It provided a stimulating environment to discuss integrated research on global sustainability. It became clear that the high degree of complexity and the interdependencies of *Future Earth* research topics represent a significant challenge for research institutions that tend to work on the basis of disciplinary science. At the national level there is a need to establish enabling infrastructure to foster more cooperation between disciplines and encourage capacity building. There appears to be a need for more strategic and collaborative research, especially in the social sciences.

There was general agreement among participants that communication and appropriate interaction between the research community and its stakeholders will help to advance our understanding of and bring solutions for interconnected problems. However, it was also recognised that these are not fundamentally new challenges and limited progress has been observed over the past decade.

The new and broader mandate of *Future Earth* was perceived as having significant potential to enable the scientific community to make a step-change in the way science is planned, executed and applied within the context of global sustainability.

There is a clear need to mobilise more expert communities, to develop more efficient research methods, to have (free) access to better data sets and to provide rewarding career opportunities in integrated global change and sustainability science. Furthermore, the strong engagement of early career scientists at the summit shows that they are highly likely to become involved in all strategic processes as well as the further development of *Future Earth* in Germany and globally.

Building on this momentum of the scientific community the German Committee Future Earth will continue its role as a national advisory board on global sustainability science and will provide support for the German scientific community to design, participate in and benefit from *Future Earth* research. The committee called upon researchers, funding bodies and users to stay involved and engaged in the development of the *Future Earth* programme. <<

### The next steps

The German Future Earth Summit was an important consultation step for the German sustainability research community.

The German Committee Future Earth will take on board all advice, ideas and criticisms from the summit in the development of a German perspective on research priorities for *Future Earth*.

In June 2014, an expert discussion will take place to develop a plausible set of 8-10 *Future Earth* research challenges. The findings will be communicated to *Future Earth* international and discussed with the broader German research community.

Towards the end of 2014 the German Committee Future Earth will establish a process to support the self-organisation of the German community to further develop integrated research topics, processes and structures in the context of *Future Earth*.

The second German Future Earth Summit will be held in early 2016 with a possible focus on enabling infrastructure and cross-cutting needs.

# ANNEX A

## Overview of submitted concepts

### DYNAMIC PLANET

#### Biosphere-Atmosphere Exchange Processes

Matthias Mauder (Karlsruhe Institute of Technology IMK-IFU)

#### Global change and local threats: From coastal and marine typologies to governance

Bernhard Glaeser (German Society for Human Ecology (DGH))

#### The Future Frozen Earth: Understanding, Documenting, Communicating and Anticipating Environmental Change and its Socio-ecological Implications in the Arctic and the Antarctic

Karin Lochte / Huhues Lantuit (Alfred Wegener Institute)

#### Land surface processes in the climate system

Hans-Peter Schmid (Karlsruhe Institute of Technology IMK-IFU)

#### Urban Environment: carbon, climate, comfort

Hans-Peter Schmid (Karlsruhe Institute of Technology IMK-IFU)

#### The Future Digital Earth - Establishing Scientific Information Infrastructures for Sustainability Research

Lars Bernhard (TU Dresden), Ralf Bill (University of Rostock), Stephan Mäs (German Geodetic Commission, DGK)

#### Decadal mass balance of glaciers and ice caps from 2000 to 2012 based on interferometric SAR satellite data

Dana Floricioiu (Remote Sensing Technology Institute IMF)

#### Global Land Use and Resource Scarcity

Patrick Hostert (HU Berlin), Antje Bruns (HU Berlin), Dagmar Haase (Helmholtz Centre for Environmental Research, UFZ), Tobias Krüger (Helmholtz Centre for Environmental Research, UFZ), Tobias Kümmerle (HU Berlin), Hermann Lotze-Campen (Potsdam Institute for Climate Impact Research, PIK), Wolfgang Lucht (Potsdam Institute

for Climate Impact Research, PIK), Jörg Niewöhner (HU Berlin), Sebastian van der Linden (HU Berlin)

#### Understanding the Indian Ocean System

Hermann W. Bange (GEOMAR Helmholtz Centre for Ocean Research Kiel)

#### Revealing Temporal and Spatial Human Dimensions of Ecosystem Developments

Hermann Jungkunst (University of Koblenz-Landau), Felix Heitkamp (Georg-August-University of Göttingen), Lisa Schüler (University of Bayreuth), Tobias Rothmund (University of Koblenz-Landau), Engelbert Niehaus (University of Koblenz-Landau), Bernhard Köppen (University of Koblenz-Landau), Jörg Bofinger

#### Dynamische Ökosysteme - Forschung in "splendid isolation" oder in ökosystemübergreifenden Ansätzen: Analyse und Management globaler Umweltveränderungen durch Integration mariner, limnischer und terrestrischer Forschung

Helmut Hillebrand (Carl-von-Ossietzky Universität Oldenburg), Antje Boetius (Alfred Wegener Institute, Helmholtz Zentrum für Polar- und Meeresforschung, Universität Bremen), Klement Tockner (Leibniz-Institut für Gewässerökologie IGB)

#### Towards a re-conceptualization of planetary boundaries

Dieter Gerten, Holger Hoff, Wolfgang Lucht (Potsdam Institute for Climate Impact Research, PIK)

#### Entangled polyrationality: The joint venture of Environmental Justice & Climate Change

Götz Kaufmann (FU Berlin)

#### Future Land Development for Sustainability regional solutions for global development

Gerhard Gerold (University of Göttingen), Patrick Hostert (HU Berlin), Hermann Jungkunst (University of Koblenz-Landau), Rüdiger Schaldach (USF-University of Kassel), Regine Schönenberg (FU Berlin)

#### Transition in (tropical) coastal zones – The challenge of global changes to coastal social and ecological systems on regional and local scales

Werner Ekau, Marion Glaser, Achim Schlüter, Hildegard Westphal (Leipzig Center for Tropical Marine Ecology, ZMT)

#### Influence of rapid socio - economic and environmental changes in BRICS countries for future of our dynamic planet

Sergey Venevsky (Center for Earth System Studies, Tsinghua University, Beijing, China)

#### Frontiers in Sustainability Research: Socio-Ecological Novelty (SEN)

Anke Jentsch (Helmholtz Centre for Environmental Research, UFZ), Bernard Slippers (University of Pretoria) Silja Klepp (University of Bremen), Vicky Temperton (Jülich Research Centre)

#### Entwicklung von automatisierten Monitoringstationen für Artenvielfalt

Wolfgang Wägele, Stephanie Pietsch (Zoologisches Forschungsmuseum Köln, ZFMK)

#### Earth Contraction and Global Earth Sustainability

Ibrahim M. Metwally (Zagazig University)

#### A need for large-scale experiments to forecast consequences of global change on biodiversity, ecosystems and their services to society

Mark Gessner (Leibniz Institute of Freshwater Ecology and Inland Fisheries, IGB)

#### Surface ocean lower atmosphere transport processes in a dynamic planet

Christoph Garbe (University of Heidelberg), Anja Engel (GEOMAR Helmholtz Centre for Ocean Research Kiel), Emilie Breviere (GEOMAR Helmholtz Centre for Ocean Research Kiel)

#### Dealing with complexity: A synthesis approach to a global change hotspot

Elisabeth Krueger (Helmholtz Centre for Environmental Research, UFZ)

#### Space Based Solar Power – The next game-changer for Global Energy strategic security

Maria C. Pou (B P & Partners)

### GLOBAL DEVELOPMENT

#### Understanding and solving land use conflicts across scales - Identifying strategies to balance land use and conservation goals using place-based research along global gradients

Ralf Seppelt (Helmholtz Centre for Environmental Research, UFZ), Aletta Bonn (Helmholtz Centre for Environmental Research, UFZ), Joern Fischer (Leuphana University of Lüneburg), Tobias Kümmerle (HU Berlin), Henrique Pereira (University

of Halle-Wittenberg), Christian Wirth (University of Leipzig), Stefan Klotz (Helmholtz Centre for Environmental Research, UFZ)

### **Green and social: Managing synergies and trade-offs between environmental sustainability and social inclusiveness**

Markus Loewe, Carmen Richerzhagen, Katharina Stepping (German Development Institute, GDI)

### **The ocean and coastal societies: Pathways towards sustainable development**

Martin Quaas, Jörn Schmidt, Rüdiger Voss, Anna Kropina, Barbara Neumann (University of Kiel)

### **Livestock: Linkages of production, environment and global cycles**

Susanne Rolinski, Jens Heinke, Isabelle Weindl (Potsdam Institute for Climate Impact Research)

### **Deliberation on Sustainable Development Trajectories in South/East-Asia**

Martina Padmanabhan (Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research)

### **The Role of Green Infrastructure and Water Sensitive Urban Design in Tackling Water Scarcity and Floods**

Bernd Eisenberg, Lisa Deister (ILPÖ University of Stuttgart)

### **A Four-Pronged Approach to Global Development with Open-Source hardware and software**

Jose Gama

### **Benefits of the sustainable intensification of small-scale food production**

Vera Tekken (University of Greifswald)

### **Water and sustainable urban futures and landscapes**

Angela Hof (Ruhr-University of Bochum)

### **Freshwater - Medium for Life and Resource for Humanity**

Klement Tockner (Leibniz Institute of Freshwater Ecology and Inland Fisheries, IGB), Laura Tydecks (Leibniz Institute of Freshwater Ecology and Inland Fisheries, IGB), Daniel Hering (University of Duisburg-Essen)

### **Valuing Ecosystem Services**

Katrin Rehdanz, Christine Bertram, Angela Kopmann (Kiel Institute for the World Economy IfW)

### **Securing progress in crop productivity with concomitant protection of natural resources and ecosystem services**

Senate Commission on Agroecosystem Research, DFG, under the aegis of: Prof. Hartmut Stützel (University of Hannover)

### **Water-Related Planetary Boundaries as Basis for a Dedicated Sustainable Development Goal (SDG) on Water**

Janos J. Bogardi, Anik Bhaduri (Global Water System Project)

### **Towards a sustainable management of atmospheric aerosol particles to minimize risks for humans, ecosystems, and economic systems**

Jürgen Burkhardt (University of Bonn), Otto Klemm (University of Münster)

### **An integrated policy framework for sustainable development**

Hermann Lotze-Campen (Potsdam Institute for Climate Impact Research, PIK)

### **Nachhaltige geothermische Nutzung und Speicherung in urbanen Räumen**

Philipp Blum und Kollegen (Karlsruher Institut für Technologie)

### **Potentials of improving food security through closing yield gaps and land use expansion**

Ruth Delzeit, Gernot Klepper (Kiel Institute for the World Economy), Wolfram Mauser, Florian Zabel (Ludwig-Maximilians University of Munich)

### **Interactions among Managed Ecosystems, Climate, and Societies (IMECS)**

Almuth Arenth (Karlsruhe Institute of Technology)

### **Options for multifunctional landscapes in Sub-Saharan Africa - Searching realism while aiming for food security, resilience, climate mitigation and socio-economic development (MULTI-SSA)**

Rüdiger Grote (Karlsruhe Institute of Technology), Achim Maas (Institute for Advanced Sustainability Studies, Potsdam), Marcus Kaplan, Michael Brüntrup (German Development Institute, GDI)

## **TRANSFORMATION TOWARDS SUSTAINABILITY**

### **Linking human well-being to ecosystem services and biodiversity changes: a social-ecological systems perspective**

Marion Glaser (Leipzig Centre for Tropical Marine Ecology), Diana Hummel (Institute for Social-Ecological Research, ISOE), Hauke Reuter (Leipzig Centre for Tropical Marine Ecology), Matthias Wolff (Leipzig Centre for Tropical Marine Ecology)

### **Social Identity and Global Environmental Crises**

Immo Fritsche und Philipp Jugert (University of Leipzig)

### **Foresight and impact assessment – Methodological challenges of story and simulation approaches relevant to regional and local decision makers in a changing world**

Jochen Schanze, Axel Sauer, Marco Neubert, Rico Vogel, Gérard Hutter (Leipzig Institute of Ecological Urban and Regional Development)

### **Towards a sustainable use of ocean resources: making the most of marine aquaculture**

Lena Göthlich (University of Kiel)

### **Traversing the oceans-climate change governance divide in addressing climate change impacts on the marine environment**

Anna-Maria Hubert (Institute for Advanced Sustainability Studies, Potsdam)

### **Vergleichende Fallstudien zu lokalen Transformationsprozessen mit Relevanz für Klimaschutz und Klimaanpassung**

Torsten Grothmann, Bernd Siebenhüner (Universität Oldenburg)

### **Sustainable Multilateralism: International Cooperation towards Sustainable Global Development**

Steffen Bauer, Erik Lundsgaarde, Sebastian Paulo et al. (German Development Institute, GDI)

### **The Sustainable Water Future Programme – Towards a Scientific, Policy Relevant, and Solution Oriented Global Water Research Program**

Claudia Pahl-Wostl, Charles Vörösmarty, Anik Bhaduri, Janos Bogardi (Global Water System Project)

### **Ko-Produktion von Wissenschaft und Politik in Future Earth**

Jan-Peter Voß (TU Berlin), Silke Beck (Helmholtz-Zentrum für Umweltforschung, UFZ)

### **The role of the new Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) in shaping transdisciplinary exchange between knowledge holders and decision-makers on different levels - A research, action and learning approach**

Lisa Marquard, Carsten Neßhöver, Katja Heubach, Christoph Görg (Helmholtz Centre for Environmental Research, UFZ); Katrin Vohland, Malte Timpte (Museum of Natural History Berlin)

### **A Global Water Ethics Charter as a Science-Policy process for global sustainability**

Rafael Ziegler (Universität Greifswald), David Groenfeldt (University of New Mexico)

### **Adapting forests to future climates: Bridging the gap of climate change research and implementation**

Lars Opgenoorth, Katrin Heer, Birgit Ziegenhagen, Sascha Liepelt (University of Marburg), Alwin Janssen (Nordwestdeutsche Forstliche Versuchsanstalt)

### **New Sustainability Pathways in Ocean Governance**

Katherine Houghton, Sebastian Unger (Institute for Advanced Sustainability Studies, Potsdam)

### **Ethics in the Research for Sustainable Development**

Simon Meisch, Thomas Potthast (University of Tübingen)

### **Regional solution for solving land use conflicts**

Senate Commission on Agroecosystem Research, DFG, under the aegis of: Prof. Ralf Seppelt (Helmholtz Centre for Environmental Research, UFZ)

### **The Role of the State in the Transformation towards Sustainability**

Ines Dombrowsky, Jörg Faust, Katharina Stepping, Sebastian Ziaja (German Development Institute, GDI)

### **Global system science: Collective action in complex and trans-jurisdictional systems**

Jochen Hinkel (Global Climate Forum e.V.) Carlo C. Jaeger (Potsdam Institute for Climate Impact Research)

### **Transformation Patterns - An Integrated Framework for Transformation Research**

Matthias Falke (Ruhr-University Bochum)

### **The Global Arctic - Arctic and non-Arctic Interactions and Feedback Loops**

Ilan Chabay, Kathrin Keil, Achim Maas (Institute for Advanced Sustainability Studies IASS)

### **Policy Analysis for Eco-Innovation Policy in promoting Sustainable Electronic Industry in Germany**

Azhan Hasan (FU Berlin)

### **Improving energy efficiency policies in developing countries through behavioural insights**

Anna Pegels, Aurelia Figueroa, Babette Never (German Development Institute, GDI)

### **Developing internationally agreeable assessment criteria for Climate Engineering**

Gernot Klepper (Kiel Institute for the World Economy), Andreas Oeschli (GEOMAR Helmholtz Centre for Ocean Research Kiel)

### **Transformations to low carbon societies: How resilient and sustainable can these transformations be?**

Claudia R. Binder, Rolf Hennicke, Wolfram Mauser, Michael Meyen, Markus Vogt (Ludwig-Maximilians University of München), Andreas Rathgeber (University of Augsburg)

### **Zukünfte im Anthropozän gestalten, aber wie? – Entwicklung neuer integrativer Bildungs- und Kommunikationskonzepte als Voraussetzung für eine große Transformation zur Nachhaltigkeit**

Reinhold Leinfelder (FU Berlin)

### **Potenziale für Transformation und Governance**

Edgar Göll (Institut für Zukunftsstudien und Technologiebewertung, IZT)

### **Fossil-fuel subsidies: measuring impacts and governing reform**

Georgeta Vidican, Nannette Lindenberg (German Development Institute, GDI)

### **Nachfrage und Angebot nachhaltiger Lebensmittel mit globaler Perspektive**

Jing Dai, Claudia Schwirplies, Andreas Ziegler (Universität Kassel)

### **Impact Assessment for Sustainable Development – A Vision for the Future**

Klaus Jacob, Sabine Weiland (Environmental Policy Research Centre, FU Berlin)

### **Deutsches Sustainable Low Carbon Society Research Network (LCS-R-Net)**

Stefan Lechtenböhmer, Manfred Fishedick (Wuppertal Institute for Climate, Environment and Energy)

### **Neue Wohlstandsmodelle als systemische Innovationen**

Maja Göpel, Philipp Schepelmann, Holger Berg, Uwe Schneidewind (Wuppertal Institut für Klima, Umwelt, Energie)

### **The political dimension of designing and adapting institutions for sustainable transformation**

Carsten Mann (TU Berlin)

### **Welche Rolle kann Citizen Science bei der Transformation zu einer nachhaltigen Gesellschaft spielen?**

Kathrin Vohland (Museum für Naturkunde Berlin), Aletta Bonn (Helmholtz-Zentrum für Umweltforschung UFZ), Reinart Feldmann, Lisa Liebenau (Helmholtz Gemeinschaft Deutschland), Matthias Premke-Kraus (Leipzig-Gemeinschaft), Josef Settele (Helmholtz-Zentrum für Umweltforschung, UFZ), Johannes Vogel (Museum für Naturkunde Berlin), Karoline Weißhuhn (Helmholtz-Zentrum für Umweltforschung, UFZ)

### **Can we use our experience from 1989 to meet future challenges?**

Susan Scharwiess

### **Urbane Reallabore**

Uwe Schneidewind, Manfred Fishedick, Lechtenböhmer, Ralf Schüle, Daniel Vallentin, Johannes Venjakob (Wuppertal Institut für Klima, Umwelt, Energie) Daniel Lang (Leuphana Universität Lüneburg)

### **What are the implications of global environmental change for conservation of species and landscapes including the possibilities for restoration, reversal of degradation and relocation?**

Birgit Gemeinholzer (University of Gießen)

### **Transkulturelle Postmaterielle Didaktik der Transformation für Paradigmen Wechseln Training in einer nachhaltigen Futurologie der Zukunft – Postmaterialism Didactics for Multicultural Knowledge Holders and Stakeholders**

Dirkmarkus Lichtenberger (Freestyleuniversity for sustainable art science and technology)

**Organisers:** Ilan Chabay (Institute for Advanced Sustainability Studies); Marion Glaser (Leibniz Center for Tropical Marine Ecology); Karen Pittel (ifo Institute); Jochen Hinkel (Global Climate Forum e.V.); Torsten Grothmann (Carl von Ossietzky University of Oldenburg).

# ANNEX B

## Workshop documentation

## Transformation Towards Sustainability

### Introduction

In order to allow productive discussions with the 95 workshop participants, who handed in 35 submissions to the transformation research theme, we clustered the submissions in three general research topics that were discussed in different workshop groups:

1. The role of individuals in transformation: social and psychological studies of human interdependence with ecosystems and of influencing human behaviour
2. The role of collective action and institutions in transformation: political, economic, institutional studies of governance at multiple scales/levels.
3. How to do transformation research?
  - (a) How to design scenarios, models and narratives,
  - (b) How to design solution oriented empirical research: action research, participation, science-policy interaction, case studies, monitoring and evaluation.

9 submissions related to topic 1, 23 submissions to topic 2 and 23 submissions to topic 3 (several submissions related to different topics; for a full overview of the categorization of the submissions see table).

At the German Future Earth Summit topic 1 was discussed in workshop group 1, topic 2 – due to the large number of participants – was addressed in two workshop groups, workshop groups 2 and 3. Topic 3 was discussed in workshop groups 4 and 5. Splitting-up the participants in these workshop groups may have influenced the identified research topics. For example, the separation of participants interested in the role of individuals in transformation from participants interested in the role of collective action and institutions in transformation may have led to the neglect of research questions that relate to both, the role of individuals and to institutions.

Every workshop group got the following task: Please identify one main research question in your workshop group that fulfils the following criteria:

1. Research question is “underresearched”;
2. Strengths in the German research community to answer the research question;
3. Research question has transformative potential, i.e. relates to solutions.

ID	Title	The role of individuals	The role of collective action and institutions	How to do transformation research?	Author(s)
TS200	Linking human well-being to ecosystem services and biodiversity changes: a social-ecological systems perspective	X		X	Marion Glaser, Diana Hummel, Hauke Reuter, Matthias Wolff
TS201	Social Identity and Global Environmental Crises	X			Immo Fritsche, Philipp Jugert
TS202	Foresight and impact assessment – Methodological challenges of story and simulation approaches relevant to regional and local decision makers in a changing world			a + b	Jochen Schanze, Axel Sauer, Marco Neubert, Rico Vogel, Gerard Hutter
TS203	Towards a sustainable use of ocean resources: making the most of marine aquaculture		X		Lena Göthlich
TS204	Traversing the oceans-climate change governance divide in addressing climate change impacts on the marine environment		X	b	Anna-Maria Hubert
TS205	Vergleichende Fallstudien zu lokalen Transformationsprozessen mit Relevanz für Klimaschutz und Klimaanpassung			b	Torsten Grothmann & Bernd Siebenhüner
TS206	Sustainable Multilateralism: International Cooperation towards Sustainable Global Development		X		Steffen Bauer, Erik Lundsgaarde, Sebastian Paulo et al.
TS207	Ko-Produktion von Wissenschaft und Politik in <i>Future Earth</i>		X	a + b	Claudia Pahl-Wostl, Charles Vörösmarty, Anik Bhaduri, Janos Bogardi
TS208	Ko-Produktion von Wissenschaft und Politik in <i>Future Earth</i>		X	b	Jan-Peter Voß, Silke Beck
TS209	The role of the new Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) in shaping transdisciplinary exchange between knowledge holders and decision-makers on different levels - A research, action and learning approach		X	b	Lisa Marquard, Carsten Neßhöver, Katja Heubach, Christoph Görg ; Katrin Vohland & Malte Timpte
TS210	A Global Water Ethics Charter as a Science-Policy process for global sustainability		X	a + b	Rafael Ziegler; David Groenfeldt
TS211	Adapting forests to future climates: Bridging the gap of climate change research and implementation		X		L. Opgenoorth, K. Heer, B. Ziegenhagen, S. Liepelt, A. Janssen
TS212	New Sustainability Pathways in Ocean Governance		X	(b)	Katherine Houghton, Sebastian Unger
TS213	Ethics in the Research for Sustainable Development			a	Meisch Simon, Potthast Thomas
TS214	Regional solution for solving land use conflicts		X	a	Ralf Seppelt
TS215	The Role of the State in the Transformation towards Sustainability		X		Ines Dombrowsky, Jörg Faust, Katharina Stepping, Sebastian Ziaja
TS216	Global system science: Collective action in complex and trans-jurisdictional systems		X	a	Jochen Hinkel und Carlo C. Jaeger
TS217	Transformation Patterns - An Integrated Framework for Transformation Research			a + b	Matthias Falke
TS218	The Global Arctic - Arctic and non-Arctic Interactions and Feedback Loops		X		Ilan Chabay, Kathrin Keil, Achim Maas

a: scenarios, models and narratives

b: how to design solution-oriented empirical research: action research, participation, and science-policy interaction, case studies, monitoring and evaluation studies

ID	Title	The role of individuals	The role of collective action and institutions	How to do transformation research?	Author(s)
TS219	Policy Analysis for Eco-Innovation Policy in promoting Sustainable Electronic Industry in Germany		X		Azhan Hasan
TS220	Improving energy efficiency policies in developing countries through behavioural insights	X	X		Anna Pegels, Aurelia Figueroa, Babette Never
TS221	Developing internationally agreeable assessment criteria for Climate Engineering		X	b	Gernot Klepper, Andreas Oeschies
TS222	Transformations to low carbon societies: how resilient and sustainable can these transformations be?			a + b	Claudia R. Binder, Rolf Hennicke, Wolfram Mauser, Michael Meyen, Andreas Rathgeber, Markus Vogt
TS223	Zukünfte im Anthropozän gestalten, aber wie? – Entwicklung neuer integrativer Bildungs- und Kommunikationskonzepte als Voraussetzung für eine große Transformation zur Nachhaltigkeit	(X)	X	b	Reinhold Leinfelder
TS224	Fossil-fuel subsidies: measuring impacts and governing reform		X		Edgar Göll
TS225	Fossil-fuel subsidies: measuring impacts and governing reform		X		Georgeta Vidican, Nannette Lindenberg
TS226	Nachfrage und Angebot nachhaltiger Lebensmittel mit globaler Perspektive	X	X		Jing Dai, Claudia Schwirplies, Andreas Ziegler
TS227	Impact Assessment for Sustainable Development - A Vision for the Future			b	Klaus Jacob, Sabine Weiland
TS228	Deutsches Sustainable Low Carbon Society Research Network (LCS-R-Net)			b	Stefan Lechtenböhrer, Manfred Fishedick
TS229	Neue Wohlstandsmodelle als systemische Innovationen	X		a	Maja Göpel, Philipp Schepelmann, Holger Berg, Uwe Schneidewind
TS230	Welche Rolle kann Citizen Science bei der Transformation zu einer nachhaltigen Gesellschaft spielen?		X	(a)	Carsten Mann
TS231	Welche Rolle kann Citizen Science bei der Transformation zu einer nachhaltigen Gesellschaft spielen?	X		b	Vohland, K.; Bonn, A.; Feldmann, R.; Liebenau, L.; Premke-Kraus, M.; Settele, J.; Vogel, J.; Weißhuhn, K.
TS232	Can we use our experience from 1989 to meet future challenges?	X			Susan Scharwiess
TS233	Urbane Reallabore			a + b	U. Schneidewind, M. Fishedick, Lechtenböhrer, R. Schüle, D. Vallentin, J. Venjakob, D. Lang
TS234	What are the implications of global environmental change for conservation of species and landscapes including the possibilities for restoration, reversal of degradation and relocation?		X		Birgit Gemeinholzer
TS235	Transkulturelle Postmaterielle Didaktik der Transformation für Paradigmen Wechseln Training in einer nachhaltigen Futurologie der Zukunft – Postmaterialism Didactics for Multicultural Knowledge Holders and Stakeholders	X		b	Dirkmarkus Lichtenberger



## The role of individuals in transformation

### Discussion in workshop group 1

Overall, the discussion had two threads. One was the incentives and motivation for individuals to undertake to change themselves in support of sustainability and the other was the relationship between individual change processes and collective societal transformation. In the former, the group discussed the importance of bottom up processes that acknowledge the needs of individuals to have not only knowledge and sense of personal capacity to act, but also clearer understanding of how daily activities connect with social goals, between long-term and short-term impacts. The use of “nudges” to motivate individual changes toward a culture of action toward sustainability was suggested, along with using challenges, which can activate personal resources, rather than threats, which can decrease sense of capacity or agency. To address the German context, the suggestion was made that the unification of Germany provides an important set of case studies of change that could be analysed in the context of individual to collective transformation.

### Results: Identified research questions in workshop group 1

Due to time limits it was not possible for this workshop group to reach a consensus regarding one prioritised research question. Instead, three research questions were identified as important relating to the topic of the role of individuals in transformation:

- How and when does the self-interested individual turn into a collective actor? How relevant are social identity, (new/local) social norms, and collective efficacy in this respect?
- Which role do local contexts play in promoting or hindering decisions for sustainable actions?
- What are positive incentives (e.g. positive narratives) of sustainable actions and how can these be further enhanced or new ones catalyzed?

## The role of collective action and institutions in transformation

### Discussion in workshop group 2

The participants thought it sensible to discuss the role of collective action and institutions without reference to specific ecosystems, as fundamental principles and problems of transformation were perceived to be of a general nature. In the discussion, the following suggestions for important research topics/foci were derived: solution-oriented analysis of governance that integrates across different issues, actors and layers; comparative and systematic analysis of historical transformation processes and identification of conditions for efficient, effective and legitimate transformation processes (beyond selective case studies); research on tipping-points and dynamics of regime shifts; resolution and productive use of conflicts in transformation processes; the importance of knowledge for transformation. Regarding the methods of this research, especially (field) experiments and “Reallabore” were suggested as promising and innovative.

### Discussion in workshop group 3

The group saw specific problems relating to oceans and freshwater systems and their hitherto underexplored interlinkages. Complex new problems connect the coastal zone, the continental margin and the high seas. Research questions arising from this were seen to be: Are current governance systems at various levels and for various stakeholders, aligned with global changes in the ocean and freshwater realms? How may ocean and freshwater governance be transformed in interaction with such environmental changes? What are the elements of a hypothetical ideal governance?

It was observed that a more comprehensive identification of stakeholders was required to clarify the potentials for inclusively designed innovative solutions and collective action.

### Results: Identified research question in workshop groups 2 and 3

Although the role of collective action and institutions in transformation was discussed in two different workshop groups it was possible to identify one main research question that both workshop groups could agree upon:

- Under which key conditions (knowledge, mechanisms,...) do individual and collective governance actors, processes and structures drive transformative change (tipping points, solutions,...) efficiently, effectively and legitimately towards the resolution of collective action problems/conflicts in the area of sustainable development?

## How to do transformation research?

### Discussion in workshop group 4

Workshop group 4 discussed both aspects of the methodological topic “How to design transformation research?”:

- (a) How to design scenarios, models and narratives,
- (b) How to design solution oriented empirical research: action research, participation, science-policy interaction, case studies, monitoring and evaluation.

During the discussion of this workshop group several aspects were addressed. It was recommended to use a multi-method strategy in transformation research including scenarios, modeling, narratives, real world laboratories and integrative didactics. Furthermore, a focus of transformation research on cities, energy, mobility, agriculture and didactics was seen as useful. Regarding the second criterion for identifying a main research question – strengths in the German research community to answer the research question – it was stressed that particularly important research traditions exist in sociology and philosophy.

Also, the high number of past projects on topics related to sustainability was stressed. But now there would be the need for analysing the results of these projects for practical consequences and to formulate quality standards for transformation research.

#### **Results: Identified research questions in workshop group 4**

Unfortunately, due to time constraints it was not possible in this workshop group to reach a consensus on one research question only. Several questions were identified as important:

- Who is the subject to whom we address our research?
- Who wants to learn and how, who wants to know?
- Which variety of methods and different ways of didactics and communication is needed for different types of stakeholders?
- How to deal creatively with conflicts between groups of interests and groups of society?
- How to work out a real vision? Could the development of visions be an effective answer to avoid or solve conflicts?

#### **Discussion in workshop group 5**

Workshop group 5 discussed only the second aspect of the methodological topic “How to design transformation research?”:

- How to design solution oriented empirical research: action research, participation, science-policy interaction, case studies, monitoring and evaluation.

Several aspects and problems of doing solution oriented, interdisciplinary and transdisciplinary research were discussed: problems of internal validity, problems of external validity / transferability / generalizability, analysis and selection of stakeholders, criteria for stakeholder involvement, lack of resources for stakeholder involvement, the possibility of reproducing power structures by involving mainly / only powerful stakeholders in the research

process, the lack of understanding between different scientific disciplines and lack of understanding between scientists and stakeholders, conflicts in the interdisciplinary and transdisciplinary process, the necessary differentiation between co-design of research questions and co-design of solutions, potentially useful mono-, multi- and interdisciplinary phases in transdisciplinary research processes. Also some ideas for doing transformation research were mentioned, like creating networks of urban “real laboratories” (German: Reallabore) that could be analysed comparatively to generate some generalizable and transferable knowledge. Some participants also recommended principles for doing transdisciplinary research like transparency of the research process and (self-)reflexivity of the researchers.

#### **Results: Identified research question in workshop group 5**

The discussion of the workshop group showed that there is a lack of agreement on how to do trans- and interdisciplinary, solution-oriented transformation research. Hence, the participants of the workshop group agreed on the following methodological research question that is very similar to the recommendation developed in workshop group 4 to formulate quality standards for transformation research:

- What could be useful reference frameworks for doing and assessing trans- and interdisciplinary, solution-oriented transformation research?

To answer this question the following “sub-questions” were developed:

- What are lessons learnt regarding useful reference frameworks from previous and ongoing trans- and interdisciplinary, solution-oriented research projects?
- How can existing methodological standards from different disciplines be integrated for trans- and interdisciplinary, solution-oriented research?

By “useful reference frameworks” the participants of the workshop group mainly referred to methodological process criteria, e.g. how to do stakeholder involvement in a scientifically sound manner. “Useful reference frameworks” were not meant as outcome criteria, e.g. how many stakeholders were involved. It was stressed that the aim should not be to develop only one list of methodological quality standards for all types of trans- and interdisciplinary, solution-oriented transformation research. Instead, a number of different reference frameworks for different types of transformation research were recommended.

Since it was seen as useful to quickly reach an agreement on such methodological reference frameworks for transformation research it was recommended to answer this research question within a Fast Track Initiative in *Future Earth*.

## A Future Earth for Future Generations? Open letter to DKN Future Earth from early career scientists in Germany

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*Att: Deutsches Komitee für Nachhaltigkeitsforschung in Future Earth DKN*

The below signatory early career scientists are excited to see that the first 10 years of the Future Earth (FE) initiative has been launched. We are very pleased to see a long-term integrative research effort to address global environmental change and the sustainability of human society. We strive to parallel an international effort of young scientists<sup>1</sup> to the international FE science steering committee with this open letter to our, national DKN Future Earth.

In particular we welcome the goal of FE to:

*"...engage a new generation of diverse researchers from all regions."*<sup>2</sup>

To succeed in this important mission we feel there are a number of clarifications that should be made regarding the goals of involving young scientists and how their involvement will be initiated and sustained. We acknowledge that Future Earth is probably the most visionary outline for how global sustainability science can be conducted at a national and global level. It is therefore all the more important that this grand vision is supported by clear steps for the engagement of a new, diverse generation of scientists. In the spirit of Future Earth's transdisciplinary approach we believe the work to develop these next steps should be carried out through collaboration between the national and global FE science community and early career scientists.

We suggest eight concrete steps that can help promote the overall goal of initiating and sustaining the involvement of early career scientists in FE:

- 1) Integrate early career scientists into the DKN Future Earth as full members as soon as possible (e.g. a representation of the FE early career scientist network), and encourage the integration at the global, continental and other national levels
- 2) In parallel to 1), initiate a broader dialogue between German early career scientist organizations and the DKN Future Earth
- 3) Allocate core FE funding for the involvement of early career scientists in Germany and abroad
- 4) Encourage the DKN Future Earth to work for explicit funding mechanism for early career scientists to do innovative, interdisciplinary and cutting-edge work within the framework of FE
- 5) Make it an explicit goal to have early career scientist represented at all DKN Future Earth events
- 6) Recruit a team of skilled early career Future Earth science ambassadors to communicate Future Earth to the broader community

- 7) Initiate broad outreach to the youngest spectra of science students via highly publicized debates where scientists address sustainability issues in an open and constructive dialog.
- 8) Make use of online communication platforms to reach the nationally and globally distributed community of researchers and to reach all of the above stated goals

Because Future Earth is a ten year initiative, engagement of early career scientists from the start carries the greatest potential to produce longer-term academic impact and returns on investment. Future Earth has the opportunity to put global change and sustainability science higher on the agenda of younger generations, and promote the growth of a truly transdisciplinary approach among young scientists to tackle these critical issues, but it requires that the overall goal to engage early career scientists is followed up with action from the onset. Thus, the DKN Future Earth can set a “best practice” example for other national and international levels of Future Earth of how to involve the next generation of FE scientists in this truly inspiring scientific adventure.

Sincerely yours,

List of signatories

Antje Bruns (Humboldt-Universität zu Berlin)  
 Simon Burandt (Leuphana Universität Lüneburg)  
 Sonja Deppisch (HafenCity Universität Hamburg)  
 Daniel Lang (Leuphana Universität Lüneburg)  
 Simon Meisch (Eberhard Karls Universität Tübingen)  
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<sup>1</sup> Open Letter: A Future Earth for Future Generations? Letter to Future Earth from young researcher organizations. [http://www.sverigesungaakademi.se/download/18.765ed0b614373537481af9/1389888152792/FutureEarth+Young+ScientistsPetition\\_onlysignatories\\_115.pdf](http://www.sverigesungaakademi.se/download/18.765ed0b614373537481af9/1389888152792/FutureEarth+Young+ScientistsPetition_onlysignatories_115.pdf)

<sup>2</sup> Reference: Future Earth: Research for global sustainability. A framework document by the Future Earth Transition Team. [http://www.icsu.org/future-earth/media-centre/relevant\\_publications/future-earth-framework-document](http://www.icsu.org/future-earth/media-centre/relevant_publications/future-earth-framework-document)

# Offener Brief an das Deutsche Komitee für Nachhaltigkeitsforschung in Future Earth

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Im Nachgang zum jüngst begangenen German Future Earth Summit Ende Januar 2014 in Berlin möchten wir, eine Gruppe von Teilnehmerinnen und Teilnehmern des Summit, einige Ideen und Reflexionen zur weiteren Entwicklung und Gestaltung von Future Earth einbringen, die aus den anregenden Diskussionen in Berlin entstanden sind.

Ausgehend von der programmatischen Zielsetzung von Future Earth, deren Umsetzung eine inhaltliche und infrastrukturelle Förderung und Stärkung der inter- und transdisziplinären Forschung in Deutschland erfordert, haben wir nachfolgend einige diesbezügliche Ideen skizziert.

Dies betrifft einerseits die Schaffung von neuen und die Weiterentwicklung von bestehenden Förderinstrumenten sowie die Anpassung der bestehenden Förderungs- und Evaluationskriterien an die Bedingungen der inter- und transdisziplinären Forschung.

Andererseits macht es die systematische Qualifizierung des wissenschaftlichen Nachwuchses hinsichtlich der spezifischen, integrativen Forschungsansätze und -methoden zur Bearbeitung der Themen von Future Earth unerlässlich.

Darüber hinaus ist es elementar, den wissenschaftlichen Nachwuchs als essentielle Säule der Forschung auch an diesbezüglichen Gestaltungs- und Entscheidungsprozessen adäquat teilhaben zu lassen. Für das DKN Future Earth heißt das, die Repräsentanz des wissenschaftlichen Nachwuchses in seinen Gremien sowie Veranstaltungen sicherzustellen.

## **1. Weiterentwicklung der Forschungsförderung für inter- und transdisziplinäre Forschung**

- Einrichtung einer ergänzenden Förderlinie für inter- und transdisziplinäre Forschung seitens der großen Forschungsförderer (DFG, BMBF etc.) zur Förderung von
  - Inter- und transdisziplinären Projekten, z.B. zur Transformationsforschung, Zukunftsforschung, ...
  - Wissenschafts-/Prozess-/Begleit- und Umsetzungsforschung zur inter- und transdisziplinären Forschung
- Einrichtung einer die Förderlinie begleitenden Fachkollegiums zur Inter- und transdisziplinären Forschung bei der DFG

## **2. Anpassung des bestehenden Kriterien- und Bewertungskatalogs für Forschungsleistungen an die spezifischen Bedingungen und Produkte/Ergebnisse inter- und transdisziplinärer Forschung durch die Forschungsförderer (im Sinne der Anreizsetzung)**

- Entwicklung angepasster Qualitätsstandards und Evaluationskriterien für inter- und transdisziplinäre Forschung → Anreize für/Aufwertung von Aktivitäten z.B. im Bereich Kommunikation, Outreach, Capacity Building und Lehrforschung als komplementäre Leistungen zu gängigen Produkten (Publikationen)

- Beteiligung der im Bereich inter- und transdisziplinärer Forschung Tätigen an der Weiterentwicklung von Qualitätsstandards und Evaluationskriterien

### **3. Systematische Qualifizierung und adäquate Beteiligung des wissenschaftlichen Nachwuchses am Future Earth-Prozess**

- Integration des wissenschaftlichen Nachwuchses in das DKN Future Earth durch Repräsentanz als vollständiges Mitglied
- Repräsentanz des wissenschaftlichen Nachwuchses bei allen Future Earth-Veranstaltungen
- Unterstützung der Einrichtung eines Arbeitskreises des wissenschaftlichen Nachwuchses, der sowohl in die Future Earth-Prozesse als auch die weitere Öffentlichkeit hinein agiert und somit Bewusstsein und Verständnis inter- und transdisziplinärer Forschung fördert
- Zuweisung eines Budgets zur Unterstützung der Aktivitäten von Nachwuchswissenschaftler/innen im Future Earth-Prozess, z.B. für Symposien, thematische Workshops, konstituierende Sitzungen

### **4. Einrichtung von Arbeitsgruppen in Future Earth zu essentiellen Themen der Plattform sowie der inter- und transdisziplinären Forschung**

#### **(1) AG Implementierungsforschung**

Als ein wichtiges Ergebnis der Diskussionen während der Tagung des ersten DKN Future Earth Ende Januar 2014 kristallisierte sich die Notwendigkeit der Erforschung von Strategien und Prozessen der Umsetzung von Forschungsprojekten heraus. Die Arbeitsgruppe wird sich dem Thema Implementierungsforschung im Rahmen von inter- und transdisziplinären Forschungsprojekten widmen. Darüber hinaus sollte sich aus Perspektive der Wissenschaftsforschung mit dem Prozess der inter- und transdisziplinären Zusammenarbeit auseinandergesetzt werden.

*Initiator/innen/Ansprechpartner/innen:*

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#### **(2) AG Konzepte und Ansätze sowie Qualitätsstandards und Bewertungskriterien der inter- und transdisziplinären Forschung**

Die Vielzahl der Ansätze und Konzepte in der inter- und transdisziplinären Forschung nimmt stetig zu. Lohnend ist zu diskutieren, wie sich die Konzepte aufeinander beziehen und welche innovativen Potentiale neu eingeführte Konzepte haben. Eine Übersicht in diese Konzeptvielfalt zu bringen, jenseits aller Konkurrenz, ist Anliegen der Arbeitsgruppe Inter- und transdisziplinäre Konzepte und Ansätze.

Aufgegriffen wird des Weiteren die Weiterentwicklung von Qualitätsstandards und Evaluationskriterien für inter- und transdisziplinäre Forschungsprojekte.

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### **(3) AG Inter- und Transdisziplinarität in der Lehre**

Die systematische Qualifizierung des wissenschaftlichen Nachwuchses hinsichtlich der spezifischen Anforderungen an inter- und transdisziplinäre Forschung ist elementarer Baustein für eine Forschung im Rahmen von Future Earth. Die AG diskutiert mögliche Formate, darunter beispielsweise die (Weiter-)Entwicklung spezifischer Master-Studiengänge bzw. Module und deren gezielte Förderung.

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### **(4) AG Stakeholder Engagement & Capacity Building im Future Earth-Prozess**

Die strategische Ausrichtung von Future Earth als ein inter- und transdisziplinäres Forschungsprogramm impliziert die aktive Beteiligung einer großen Bandbreite verschiedener Akteure in den verschiedenen Themenfeldern, darunter zivilgesellschaftliche Organisationen, die wissenschaftliche Bürgerbeteiligung (Citizen Science) oder Akteure aus kreativen und künstlerischen Feldern. Die Arbeitsgruppe Stakeholder Engagement und Capacity Building will das Future Earth Komitee bei ihren diesbezüglichen Aktivitäten durch das Erproben und Evaluieren verschiedener Beteiligungsformate an Future Earth unterstützen.

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### **(5) AG Umgang mit Normativität**

Future Earth ist ein explizit auch evaluatives und normatives Forschungsprogramm. Daher ist es wesentlich, im Rahmen einer sich programmatisch als objektiv und wertfrei verstehenden Wissenschaft akademisch und partizipativ zu diskutieren, wie mit Normativität umgegangen werden kann.

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