RIHN Research Development Workshop

Transdisciplinary Sustainability Research:
Methods, Processes, and Practical Examples

Work Package Report

Kyoto, Japan

14-15 November, 2013

Workshop Guests

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Contents

The Workshop in a Nutshell…

The RIHN Research Development Workshop "Transdisciplinary Sustainability Research: Methods, Processes, and Practical Examples" was a collaboration between the Research Institute for Humanity and Nature and Leuphana University Lueneburg and part of an overall effort to mutually expand our understanding of transdisciplinary (Td) research in theory and practice. Participants were diverse, representing project proposers, researchers and leaders of ongoing projects, and Td enthusiasts eager to think deeply on the critical task of developing a mode of science receptive and reflexive enough to tackle the sustainability challenges of our time. Some of the important issues discussed regarded the need for exploring explicitness of meaning in our work, working together to create a methodological foundation for Td, and building empathy across the various socio-cultural divides rooted in our research.

The workshop was conceptualized as a sequence of presentations, group work sessions and plenary presentations of results, and concluded with a panel discussion.

Participants were moderated through a concept work exercise in which certain keywords related to Td research were identified and their meanings explored together in groups. Previously taken-for-granted keywords such as "co-design," "integration," "solution oriented," and "stakeholder involvement" were scrutinized, their varied meanings unearthed and made explicit. The power of this simple, yet effective means for bringing about a common understanding among groups was evident to all and is sure to be incorporated in Td research efforts at RIHN.

The notion of developing mutual understanding among scientists and stakeholders was extended in the discussion on the challenge of advancing Td methodology able to create socially robust knowledge. For researchers *engaging in/with* society one of the main challenges lies in how to foster traceability in highly unpredictable research processes. Examples of Td research in Europe and throughout Asia were examined critically in this light. The Transdisciplinary Case-Based Mutual Learning Session was offered as an appropriate format for mutual learning in transdisciplinary settings, being formalized (guided by principles and procedures) and oriented toward one or a small set of cases. In addition, the formalization of research tasks and procedures previously considered as of secondary importance, namely methods for fostering collaboration with stakeholders, integration of knowledge realms, formative evaluation, and the management of research teams, take on new significance in inter- and transdisciplinary research.

Participants engaged in various group work to flesh out these discussions in relation to the research projects they are working on or plan to work on. In particular, the barriers that exist between the mutual learning, understanding, and formalizing stages in research were of concern, as well as the roles/responsibilities of participants involved in Td research and their contributions, including the type of knowledge they might provide. These issues were brought forward in a plenary discussion highlighting the intense level of intercultural contextualization that accompanies Td research. Stories on the challenges experienced in different countries, with diverse research teams, and with myriad stakeholders were shared and panelists advised on ways for overcoming them.

In the end, participants came away from the workshop with a renewed sense of the need to be **"humble scientists,"** actively *inhabiting* their research sites, in service of society.

Workshop Structure

<u>Nov, 14, 2013</u>

09:20 - 10:50 am	Introduction to inter- and transdisciplinary research in sustainability science (Daniel J. Lang)
10:50 – 11:05 am	Break
11:05 – 12:00 pm	Inter- and transdisciplinarity / stakeholder involvement / participatory research at RIHN: Concept work (Ulli Vilsmaier)
12:00 – 13:00 pm	Lunch
13:00 – 14:00 pm	Design principles for transdisciplinary sustainability research (Daniel J. Lang)
14:00 – 15:00 pm	Presentation of selected RIHN Td projects
15:00 – 15:30 pm	Break
15:30 – 16:30 pm	Group Work I: joint analysis of RIHNs research projects and research proposals
16:30 – 17:30 pm	Plenary presentations and discussion

<u>Nov, 15, 2013</u>

09:20 - 10:35 am	Transdisciplinary case studies in sustainability research at Leuphana and elsewhere (Daniel J. Lang)
10:35 – 10:50 am	Break
10:50 – 12:00 pm	Methods for inter- and transdisciplinary research (Ulli Vilsmaier)
12:00 – 13:00 pm	Lunch
13:00 – 14:30 pm	Group Work II: How to include selected methods and principles into RIHNs research projects in order foster sustainable research
14:30 – 15:30 pm	Wrap up & Discussion
15:30 – 16:00 pm	Break
16:00 – 17:30 pm	Panel Discussion: Transdisciplinary research from an intercultural perspective: socio-cultural, institutional and economic context conditions

List of Participants

Project / Project Proposal Participants (15)	
Masayuki Onishi* (FS Biocultural Diversity)	RIHN
Ben McLellan* (FS Anthropospheric Energy)	Kyoto University
Steven R. McGreevy* (FS Lifeworlds of Agrifood)	RIHN
Ryohei Kada* (R-06)	RIHN
Tadayoshi Masuda (R-06)	RIHN
Tetsu Sato* (E-05 Init)	RIHN
Reiko Omoto (E-05 Init)	RIHN
Shion Takemura (E-05 Init)	RIHN
Jumpei Kubota* (C-09 Init)	RIHN
Agnes Rampisela* (C-09 Init)	RIHN
Hironori Hamasaki (C-09 Init)	RIHN
Sakoto Hashimoto (C-09 Init)	RIHN
Akiko Endo** (R-08 Init)	RIHN
Naoki Masuhara (R-08 Init)	RIHN
Satoshi Ishikawa* (D-05)	RIHN
Non-project Participants (12)	
Tetsuzo Yasunari	RIHN
Yuka Hayakawa	Tokyo Inst. Of Technology
Hein Mallee	RIHN
Itsuki C. Handoh	RIHN
Takashi Kurata	RIHN
Abe Kenichi	RIHN
Tetsuya Hiyama* (C-07)	RIHN
Sander van der Leeuw	RIHN/ASU
Soichi Mori***	MEXT
Mahgoub Suliman Mohamedain	RIHN/Sudan University
Terukazu Kumazawa	RIHN
Daisuke Naito	RIHN
Guests	
Ulli Vilsmaier	Leuphana University
Daniel J. Lang	Leuphana University
Staff	
Mikiko Hirose	RIHN
Shinichi Wade	RIHN

* Project Leader or Principal Investigator
** Project Co-leader
*** Japan Future Earth Committee

Project Linkage

RIHN is interested in establishing a more robust foundation for research development based on interdisciplinary and transdisciplinary research principles and methods. It currently houses 24 interdisciplinary and transdisciplinary-oriented research programs at various stages (some completing their research, others just beginning) and, some of the

projects would welcome a chance to improve their transdisciplinary methodology (anything from framing to stakeholder involvement for co-designing/co-production of knowledge) and receive some project-focused advice from transdisciplinary experts. Presentations on transdisciplinary research projects some of which are conducted at Leuphana and others at RIHN, offered an opportunity to better understand what transdisciplinary "in the field" looks like.

This was an excellent opportunity for FR projects to take stock of their current stakeholder-integrated methodologies and ask these methods experts for advice or feedback. It was also a chance to see how transdisciplinarity is defined and enacted in Europe.

Additionally, since IS, FS, and PR projects are still in a preliminary stage of research, this workshop was a welcomed opportunity to reflect on their research framework, plan, and proposed methodologies and also receive advice or feedback in this regard.

Workshop Aims

- To improve RIHN projects' transdisciplinary methodology and research designs
- To get a better understanding of how transdisciplinarity "in the field" is being enacted in a variety of socio-cultural contexts
- To further the existing discussion on transdisciplinarity at RIHN in hopes of distilling an answer to the question "What is transdisciplinarity at RIHN?"

Starting Points

Preparation Guide

In order to create a joint starting point for the workshop, preliminary work was requested and carried out with participants. An outline of workshop, preparation guide, and literature list was sent out to research groups in October to complete before the workshop. The preliminary work served as an important background for workshop organizers to address within the content of the workshop and allowed for feedback to prepared beforehand.

Project and project proposers were asked to elaborate on the following questions within the research teams and submit the answers to workshop organizers.

- Objectives: What are outcomes (aim horizons) of the research project? [distinguish between: scientific aims/society-oriented aims]

- Knowledge structure: Which sources of knowledge are incorporated in the research project/will have to be considered to meet the research objective? [name: disciplines/sub-disciplines, non-scientific knowledge fields]

- Methodology: What general methods do you apply/do you plan to apply? Are there particular inter- and transdisciplinary methods/methodological elements that are already applied/are planned to be applied in the project?

Information on completed preparation guides can be found in the appendix.

Symbol Work

As a starting point for creating mutual understanding of the participants' concept of transdisciplinarity, each participant was asked to draw symbols representing the following notions *[using blank sheet of paper]*:

Disciplinarity – Interdisciplinarity – Transdisciplinarity

The results were pinned on a board and served as an anchor for the participants' presentations, including name, project name and a brief comment on the symbols provided.
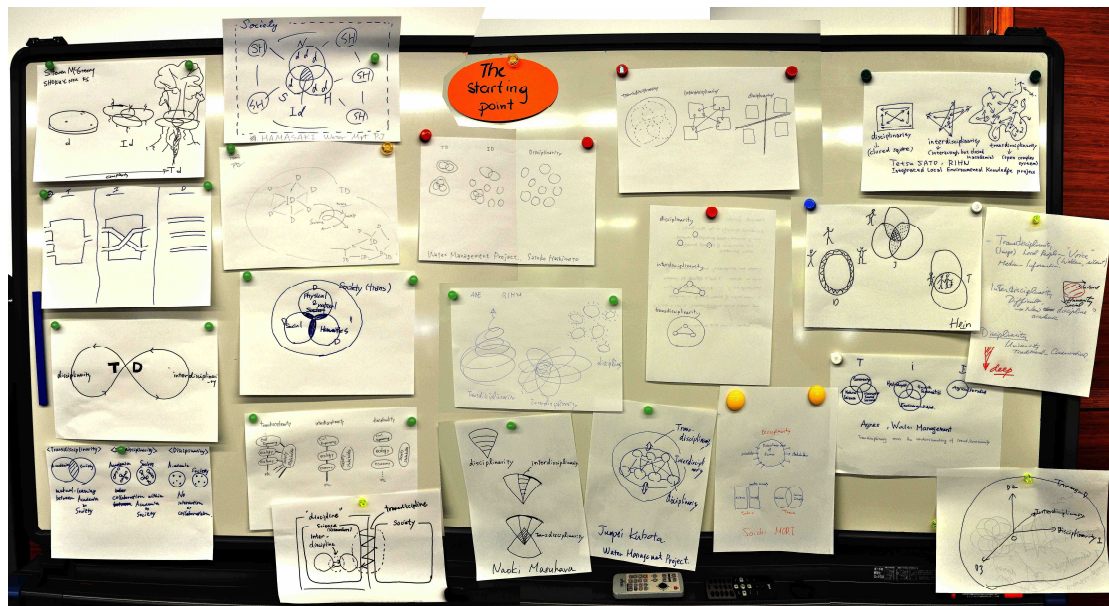
Participant's symbols of "Disciplinarity, Interdisciplinarity, and Transdisciplinarity"

Symbol work

Concept Work

As words are the material of which our theories are built, no matter whether they are scientific or not, a major requirement for research in teams is to work on concepts. Concept work aims at unfolding the meanings and the theoretical foundation of terms we are using in our research or professional activities. This is a generally underestimated task. The failure in inter- and transdisciplinary research is often rooted in a lack of conceptual work at an early stage of the research process (Bergmann 2012). One of the many reasons for this underestimation is that many concepts applied in research are at the same time used in everyday communication where there are weakly structured and commonly used (Klein 2000).

Concept work can support the identification of societal problems in highly unstructured situations with explorative character. It is essential in the framing of a problem and the formulation of research questions and can lead to recursive loops when it comes to identify or understand dimensions or facets that have not been expressed before. It is particularly important when people from different cultural backgrounds (speaking different languages) come to work together.

To explore key concepts in inter- and transdisciplinary research, a first step towards clarification is to jointly identify key concept. For the concept-work realized in the course of the workshop, key concepts related to transdisciplinary research at RIHN. The following concepts were jointly identified:

- Co-design
- Integration
- Solution oriented
- Stakeholder involvement
- Participatory research
- Evaluation system

- Mutual learning
- Interdisciplinarity
- Societal impact
- Science / society
- Co-production

Further, the following tasks were implemented in four groups, each group working on one of the selected concepts: Co-design, integration, solution-oriented, stakeholder involvement.

Tasks: Concept Work
  i. Individually write down a list of associative terms that are related to the key-concept [use a blank sheet of paper].
  ii. Identify constitutive elements that characterize the concept out of your associative list. *[write down 3-5 key elements on yellow post-its; 1 term per post-it]*
  iii. Present the results to the team. *[pin post-its to the board]*
  iv. Jointly analyze the constitutive elements of each group member. Identify commonalities, contradictions and potential interfaces. *[structure the constitutive elements on the board]*.
  v. Present the group-results to the plenary. [*decide before starting who is doing the presentation]*

Concept work on "solution oriented"
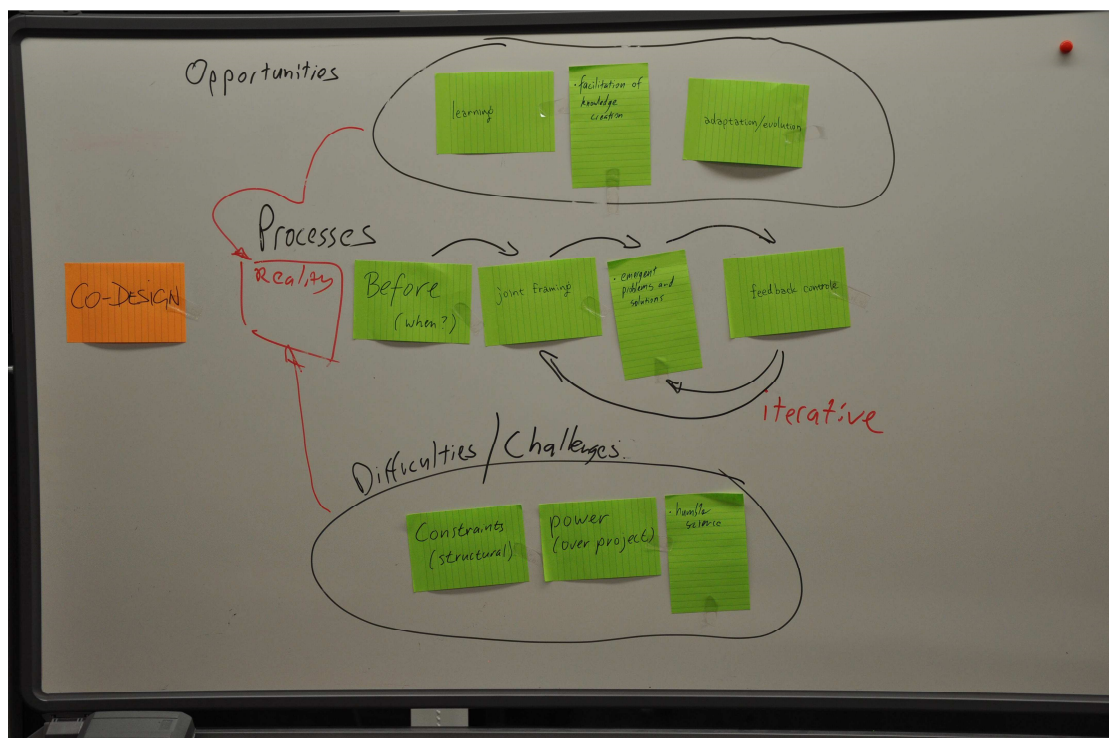
Concept work on "co-design"

Summary of Presentations

November 14th

Introduction to inter- and transdisciplinary research in sustainability science, Daniel Lang

Daniel Lang gave an introduction to *inter- and transdisciplinary research in sustainability science* to shape the field and outline the particular challenges of a solution-oriented sustainability research. He pointed to the need of a new societal contract for transformation and the changing role of science in this context, including a comprehensive perspective, specific types of knowledge and new forms of knowledge production/integration. He provided a definition of 'socially robust knowledge' and discussed the long way from knowledge to action, where transdisciplinary research should contribute to and help to improve it.

Besides the presentation of the research field of the two primary presenters of the Workshop, Ulli Vilsmaier and Daniel Lang, also their university – Leuphana University Lueneburg – was presented in this first slot.

Design principles for transdisciplinary sustainability research, Daniel Lang

Daniel Lang introduced transdisciplinary sustainability research as a "reflexive, integrative, method driven scientific principle [practice] aiming at the solution or transition of societal problems and concurrently of related scientific problems by differentiating and integrating knowledge from various scientific and societal bodies of knowledge." (Lang et al. 2012). Based on the paper *Transdisciplinary Research in Sustainability Science – Practice, Principles, and Challenges*, published by Lang, D. J., A. Wiek, M. Bergmann, M. Stauffacher, P. Martens, P. Moll, M. Swilling & Ch. Thomas (2012) in *Sustainability Science 7/1,* 25-43, he introduced the three phases and pathways in transdisciplinary research (based on Keil (2009) and Jahn (2008)) and according principles. In his presentation he focused on the following principles:

- Create joint understanding and definition of the sustainability problem to be addressed
- Design a methodological framework for collaborative knowledge production and integration
- Assign and support appropriate roles for practitioners and researchers
- Realize two dimensional integration
- Evaluate scientific and societal impact
- Facilitate continuous formative evaluation.

Presentation of selected RIHN Td projects:

Yaman ng Lawa: A Platform for Sustainable Management and Utilization of Laguna Lake Resources, Tadayoshi Masuda (R-06)

Dr. Masuda summarized the work of the LAKEHEAD Project (Managing Environmental Risks to Food and Health Security in Asian Watersheds) at Laguna Lake in the Philippines, a collaborative effort between interdisciplinary Japanese and Filipino academic institutions and the Laguna Lake Development Authority. He outlined the research design as analyzing the connection between upstream ecological changes and various food and health security impacts downstream such as heavy metal pollution, loss of biodiversity, changing water cycle, food safety and contamination, and infectious diseases. Transdisciplinary teams of local medical researchers, political leaders, and "Barefoot Ecological Risk Researchers" analyzed the possible causes of food and health risks and developed a number of tools for community use, including an early warning system to identify lake water quality changes and a health screening protocol to identify populations at risk from contamination. As much of the risk was driven by development and urban intensification, payment for ecosystem services and other stakeholder-based policy mechanisms were recognized as having the potential to affect land use changes (primarily agricultural) in upland areas.

Human-Environmental Security in the Asia-Pacific Ring of Fire: Water, Energy, Food Nexus, Akiko Endo (R-08 Init.)

Dr. Endo pointed out that the interplay between water and energy, and water and food needs is creating conflict and the emergence of tradeoffs between these resources among stakeholders in the Asia-Pacific "ring of fire" region. The challenge is how to design optimal policy within this resource nexus able to be governed by stakeholders amidst these conflicts. She presented some cases from the project to be examined in a transdisciplinary manner, including the tradeoff between hot springs tourism and geothermal energy in Beppu, Kyushu, the use of water on land and fisheries production in Obama, Fukui, and the decision to construct tsunami walls and the reduction of ecosystem services that may result by separating land & ocean in Otsuchi, Iwate. Specifically, solution-oriented participatory methods (including case studies) will be employed at each of these sites by teams composed of project researchers and local stakeholders. In addition, an integrated index is being developed to express human-environmental security in terms of a nexus between water, energy, and food.

Integrated Local Environmental Knowledge: Supporting decision making and actions toward sustainability, Tetsu Sato (E-05 Init.)

Dr. Sato began with questioning the effectiveness of scientific outputs for stakeholder communities and overall sustainability goals for society. As a possible solution, he highlighted the work of "residential researchers/scientists" practicing "local science for environment and sustainability" working toward solutions for the communities in which they live in a transdisciplinary way with practioners in society. He emphasized the role of residential researchers as having multiple identities as scientists bridging the academic world with localities (translating knowledge bilaterally), as well as community members with a stake in the outcomes of work. He went on to describe the work of the Integrated Local Environmental Knowledge (ILEK) project as it operates at a meta-level to analyze over sixty sites where residential researchers and institutions are creating, mediating, and communicating ILEK in sustainability oriented efforts toward adaptive management of

"new" commons. ILEK is also concerned with defining the role of science in/for society and in developing conceptual models and frameworks connecting knowledge production, decision making and action at individual level, and adaptive social change.

November 15th

Transdisciplinary case studies in sustainability research at Leuphana and elsewhere, Daniel Lang

Daniel Lang presented different transdisciplinary research activities between Leuphana University and the city of *Lüneburg'*, Germany and its surroundings. The transition project *Lüneburg' ('The Real World (Transition) Laboratory Lüneburg'*) aims at fostering a sustainable region developing in terms of robust regional economy, increased quality of life, and ecological innovation. The project *OneLüneburg* servers as an example of transdisciplinary research at the interface of science and SMEs and aims at understanding the potential role of sustainable neighborhoods as *transition cells* fostering local/"regional" sustainability transitions. Further it aims at developing principles, processes and „building blocks" of sustainable neighborhood development and at building the capacity of regional actors/stakeholders related to sustainable neighborhood development. LÜNESCO serves as an example of a transdisciplinary research and a teaching project where students of the Master of Sustainability Science collaborate with the city administration of *Lüneburg'*. The Masters Program contains a transdisciplinary research course of 2 semesters (20 ECTS). The involvement of students in the research at the Science|Society interface has a strong and positive impact. DialogN is presented as an example of NGO – science cooperation. Further, a project on socio-ecological research in Romania and its transdisciplinary scenario-based approach was presented and the initiative *2042: Germany, Europe, World - A transformation is possible* was introduced together with an invitation to search for future cooperation between Leuphana and RIHN.

Methods for inter- and transdisciplinary research, Ulli Vilsmaier

Ulli Vilsmaier started from the question: *How to foster traceability in highly unpredictable research processes*? Her main argument is that there is need to produce not only socially robust knowledge, but also knowledge that is acknowledgeable by scientific communities in order to consolidate transdisciplinary research. Thus, the conditions for creating ‚robust knowledge' change fundamentally when including the former research subject to the research team. When moving from empirical to transformative research we are overcoming the big divide between the active researcher and the passive research subject. She suggests *re-thinking the concept of ‚methods'* in inter- and transdisciplinary research. Due to the diversification of actions/tasks required in inter- and even more so in transdisciplinary research, she argues to conceptualize an understanding of methods *for* inter- and transdisciplinary research that does not only encompass research methods in the sense of formalized procedures of data collection, processing and interpretation, but also formalized procedures of e.g. collaboration, integration, assessment and management. In the second part of her presentation she introduced *Transdisciplinary Case Based Mutual Learning Sessions* as a format that can be applied in different phases of transdisciplinary research, at different scale levels, and for different purposes in transdisciplinary research.

Summary of Tasks, Group Work I, II

For the in-depth analysis of RIHN research projects and research proposals, 3 groups were built, each consisting of members of an ongoing research project and representatives of a research proposal as well as observers, choosing a group according to their thematic interest.

Each group work was followed by a presentation course where posters of each group (project/proposal) were presented and results critically discussed.

Group Work I

Group Work I followed the presentation and discussion on design principles for transdisciplinary sustainability research (Daniel J. Lang) and therefore focused on principles realized / conceptualized in RIHNs research projects / proposals. The groups were asked to work on the following tasks (or selected tasks of the following list):

(1) Give a short presentation of the research project / proposal to the group.
(2) Go through design principles (Lang et al. 2012): Which principles are applied in the research project / proposal?
(3) Have other principles (implicitly or explicitly) guided the (development of the) research project? If yes, formulate them.
(4) What else characterizes the research project / proposal as transdisciplinary?
(5) Is there a balance between the expected scientific/generalizable insights and contributions to societal/case specific transformations? How can the research project be further developed to improve this balance?

Group Work II

Group Work II followed the presentation and discussion on methods for inter- and transdisciplinary research (Ulli Vilsmaier). It focused on conditions for joint research at the science|society interface, systematically exploring transdisciplinary situations experienced by the participants and describing methods applied.

(1) Give a short orientation on where you ended up in Group Work I.
(2) Pick out (already realized or planned) situations of direct collaboration between scientists and stakeholders from the different societal spheres.
(3) Write down the roles/responsibilities stakeholders take over in this particular situation.
(4) Identify the knowledge types they contribute with and other forms of contributions.
(5) Describe the method(s) you applied / plan to apply in this situation.

Plenary Discussion "Td research from an intercultural perspective"

As Td research is regarded to be a very contextualized mode of research, scientists, are working with different dimensions of culturality: cultures of cognition and practice, knowledge cultures, scientific cultures, and cultures of origin. In this light, the panel aimed at asking if different contexts, especially socio-cultural, institutional, and economic conditions, make a difference for Td research. To explore these notions, a diverse panel of Td researchers with deep experience in different socio-cultural contexts was assembled and questioned. The panel was moderated by Ulli Vilsmaier.

Panel members

	Country of origin	Academic background
Tetsu Sato	Japan	Ecology, resource management
Sander van der Leeuw	Holland	Archaeology
Tetsu Yasunari	Japan	Climatology
Steven R. McGreevy	USA	Environmental sociology
Hein Mallee	Holland	Development, social science
Daniel J. Lang	Germany	Sustainability science

Panel members introduced themselves referring to personal experiences and field projects from all over the world: Southern Europe, Africa (Malawi), Himalayan region, Japan, China, Switzerland, and Germany. Field experiences served as an eye-opener and as sources of inspiration to explore new pathways in research. One topic that emerged during the introductions was the need to reshape the science ‖society interface, as modern science emerged from a European dominated way of structuring knowledge. Accordingly, it was critically discussed whether it is possible to refer to science as one entity when looking at the science | society interface in an intercultural perspective The need for transformative science to address real-world issues such as poverty, rural population decline, rural development, and civic voice in infrastructural projects such as the construction of nuclear power-plants was also strongly recognized through experiences in the field.

In the course of the discussion, the following aspects were addressed:
First, the discussants agreed that it is necessary to acknowledge the differences in academic and social cultures within research teams and the broader research community, since science operates not as one homogenous entity, but as a historically contingent, plurality of practices. Within this realm of discussion, panelists identified the notion of hierarchy and power-structures related to the position of science in society as well as in the context of working in multicultural research teams. For example, Dr. van der Leeuw told of many cultural peculiarities related to language, food habits, and national character that complicated the work within research teams. Also, different attitudes on working with scientists depending on similarities or differences of social strata or social histories in different regions were mentioned. Some panelist share that it was helpful to engage with stakeholders in the actual field study sites themselves and define explicitly the different perspectives relevant to local people's concerns and the research endeavor as a whole. In countries with a strong, top-down authoritative structure for science, the engaging manner of Td-like research methods, such as Participatory Rural Appraisal, can be frustrating for stakeholders— Dr. Mallee shared an example in rural China where a local farmer spoke up at a meeting, saying "Why don't you just tell us what to do? We come to meetings and discuss many things, but you never tell us what to do." An other experience the panelists share is that many times, the way to bridge the different universes of experience between researchers and stakeholders are through ritualized initiation: drinking or working together.

Ultimately, the importance of residential researchers and other collaborators able to translate meaning and intention between scientific and societal groups was highlighted.

Panelists were also asked what are the hindering and strengthening conditions for Td research. Dr. Lang identified the culture of decision making in different societies as being a crucial point, as well as the economic conditions of the researchers themselves since Td research requires time, funding, and freedom. As a critical aspect. it was mentioned that in some cases we must be wary of stakeholder's motivation for participation in Td research as these interests can shape the "data" due to conditions of hierarchies of power and economic conditions. In the end, Dr. Sato reminded us, an attitude of humility, of the "humble scientist," can go a long way in strengthening the ties of communication and empathy between researchers and stakeholders.

As a final question, panelists were asked what are the most important factors to realize and consolidate Td research as a transformative research mode in sustainability science? Dr. Yasunari emphasized the need to share the issues and concerns of local stakeholders and have an open dialogue around these issues. Dr. McGreevy called for scientists to take a leadership role, focus on research for societal impact, and not lose sight of the ultimate goals of why we conduct science in the first place.

The panel agreed, that Td scientists must walk a fine line in a rapidly-changing world. It can be argued that ccience has lost its position of privilege in international discourse because it has lost touch with real-world problems. To this we must ask, are we scientists or citizens first? Td research for whom? Keeping in mind the potential of science for affecting sustainable change and that Td research is one tool, one means to that end, we call for scientists to take on a new attitude of humility and service for society.