



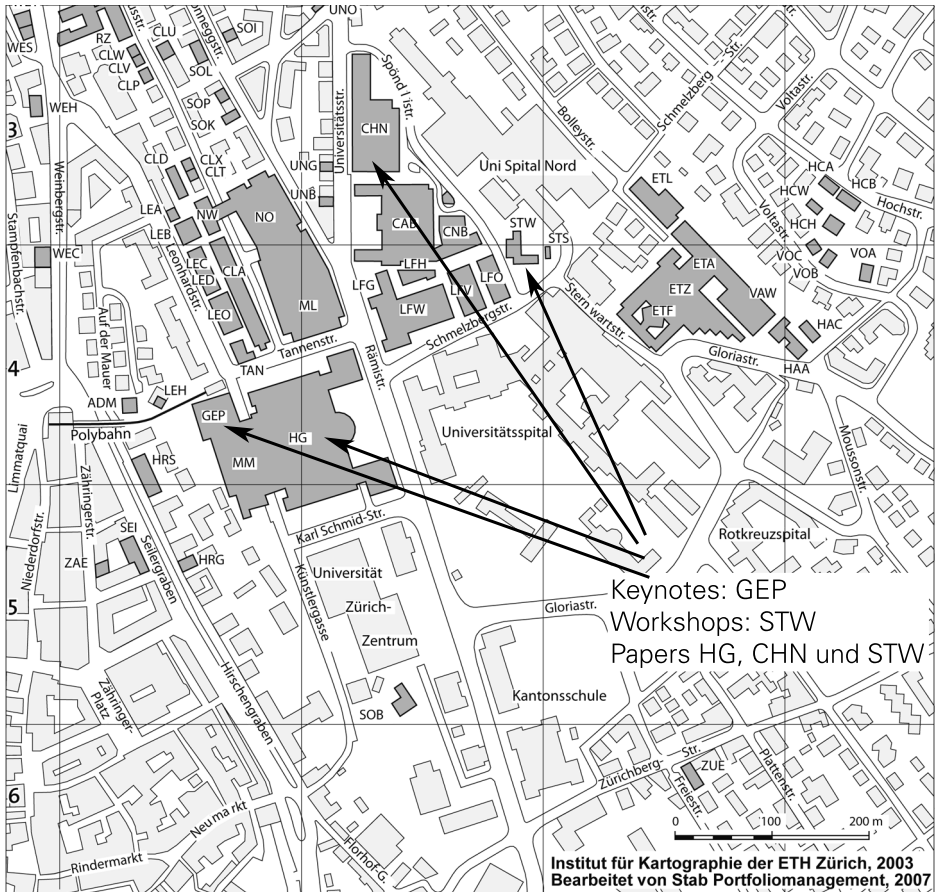
Akademien der Wissenschaften Schweiz
Académies suisses des sciences
Accademie svizzere delle scienze
Academias svístras da las ciencias
Swiss Academies of Arts and Sciences

**td-net for transdisciplinary research,
a project of the swiss academies**

td-conference 2008

**Problem Framing in Inter- and Transdisciplinary Research
Zurich, 27 & 28 November
Collegium Helveticum (ETH & University of Zurich)**





GEP = GEP Pavillon

From the train station: Walk to Central (tram stop at the other side of the bridge) and from Central with the Polybahn (leaves every three minutes) up to the Polyterrasse (back entrance of HG).

HG = Hautgebäude /Main Building of the ETH Campus:

In six minutes with tram no. 6 (direction Zoo) from main station (Bahnhofstrasse) or with tram no. 10 (direction Seebach) from main station (Bahnhofplatz) to the stop ETH/Universitätsspital (the 3rd stop).

You are now standing exactly opposite the main building of ETH Zurich and there is an information desk in the main hall on your right as you enter the building.

STW = Semper-Sternwarte, Schmelzbergstr. 25 = home of the Collegium Helveticum

CHN = Department of Environmental Sciences, Universitätsstrasse 16

Problem Framing in Inter- and Transdisciplinary Research

Welcome at the

Collegium Helveticum (ETH & University of Zurich)

Theme

Inter- and transdisciplinary research comprises modes of research that integrate information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or other bodies of specialized knowledge. “Interdisciplinary research” is often used as the umbrella term to denote integrative research that (i) advances fundamental understanding and (ii) contributes to problem solving in the knowledge society. In the European context – and specifically in German-speaking countries – “transdisciplinary research” stands primarily for research that is driven by problem solving and that integrates perspectives from public agencies, the private sector and civil society in the research process.

Problem framing plays a crucial role in inter- and transdisciplinary research since identifying and structuring the problem and defining research questions within an unstructured or pluralistically-viewed problem field means to constrain the further analysis of the problem. The problem framing constrains what can be captured by early detection strategies, what can be addressed by research and which problem-solving options are investigated and taken into consideration. The challenge of problem framing lies in the diversity of perspectives: The perspectives of researchers from different disciplinary backgrounds (such as the natural or social sciences, the humanities or the engineering and medical sciences) as well as perspectives of actors from the private sector, civil society or public agencies. The task is to interrelate these various perspectives through the problem within a collective process. This task includes: making the disciplinary and life-world perspectives explicit; framing a joint or complementary understanding of the problem; defining research questions for a better understanding of the problem or to help prevent or solve the problem.

How to adequately reveal and interrelate the diversity of perspectives in inter- and transdisciplinary problem framing is currently neither well understood, nor are there widely shared methods to deal with the issue. There are, however, many researchers who have experienced and managed inter- and transdisciplinary problem framing in a learning-by-doing manner.

Programme

Thursday, November 27

11:00 – 11:15 **Welcome + Introduction**

GEP Pavillon **Gerd Folkers**, Collegium Helveticum
Gertrude Hirsch Hadorn, ETH Zurich and td-net

11:15 – 12:00 **Why Problem Framing is a Problem**

GEP Pavillon Keynote 1:
Brian Wynne, CESAGen, Lancaster

12:00 – 13:00 Lunch

13:00 – 13:45 **Social Integration – A Matter of Age and Gender**

GEP Pavillon Keynote 2:
Pasqualina Perrig-Chiello, Institute for Psychology, Berne

14:00 – 15:30 **Slot I (parallel sessions):**

STW 1 Workshop 1: Problem Framing in Transdisciplinary
Case Studies on Sustainable Development

STW 2 Papers 1: Health; technology assessment (TA)

HG F 33.1 Papers 2: Health; violence; Africa

HG F 33.2 Papers 3: Social integration; governance

HG F 33.3 Papers 4: Nano; GM plants; sustainability

15:30 – 16:00 Coffee break

16:00 – 16:45 **Approaches in Problem Framing in Health Research Development**

GEP Pavillon Keynote 3:
Marcel Tanner, Swiss Tropical Institute, Basel

17:00 **td-award Ceremony**

STW td-net, Stiftung Mercator Schweiz, winning team
Laudatio: **Barbara Haering**

17:30 **Conference Reception (Apéro)**

You find the location of buildings GEP, STW, HG and CHN on the map (page 1 and flyer). The letter after the building acronym refers to the floor, the number to the room number.

Friday, November 28	
09:00 – 09:45	Learning and Knowing for Change: The role of intermediate concepts in land use research
GEP Pavillon	Keynote 4: Bernard Hubert , INRA, Paris
09:45 – 10:15	Coffee break
10:15 – 11:45	Slot II (parallel sessions):
STW 1	Workshop 2: Literature and Medicine in Dialogue: Narrative means
CHN D 46	Papers 1: Environment; uncertainty; art-as-research
CHN D32	Papers 2: Stakeholder Dialogues and Problem Framing of Sustainable Energy Options
CHN D 44	Papers 3: Hospitals; consumption; decision support
STW 2	Papers 4: Tracking the Human; local knowledge; plurilingualism
11:45 – 12:00	Walk to plenary room (5-10 minutes)
12:00 – 12:45	Cultural Change: The art of shifting goal posts
GEP Pavillon	Keynote 5: Sally Jane Norman , Culture Lab, Newcastle
13:00 – 14:00	Lunch
14:15 – 15:45	Slot III (parallel sessions):
STW 1	Workshop 3: Problem Framing as a Bridge between Teaching and Research
STW 2	Papers 1: Land use; risk; gender
HG D 3.1	Papers 2: Methodology; participation
HG D 3.3	Papers 3: Systems; complexity; body
HG D 5.1	Papers 4: Methodology; translational research
15:45 – 16:15	Coffee break
16:15 – 17:15	Roundtable: Wrapping up and looking ahead
GEP Pavillon	Moderator: Gerd Folkers (Collegium Helveticum) Participants: Rainer Egloff (Collegium Helveticum), Bernard Hubert, Sally Jane Norman, Pasqualina Perrig- Chiello, Brian Wynne
	End

Keynote speakers

Bernard Hubert Senior Scientist at the *Institut National de Recherche Agronomique (INRA)* and Directeur d'études at the *Ecole des Hautes Etudes en Sciences Sociales (EHESS)*. He is trained as an ecologist (his thesis study concerned functional ecology in Western Africa), but his work has broadened as he has questioned the role of human activities in this setting, seeking to understand the contribution of the social sciences to issues in the life sciences. He put this thinking into practice by heading a research unit on ecological development oriented towards the links between animal husbandry and land uses in Southern France. This approach led him to reflect upon cross-disciplinary studies and the conduct of interventional, mission-oriented research with the actors concerned. He is now, since mid 2007, the head of a joint venture between INRA and CIRAD, the *French Initiative for International Agricultural Research (FI4IAR)*, which will provide the two organizations, at the highest level, with real strategic study forums that will enable them to work towards pertinent and open proposals of scientific programs aimed at both national and international decision-makers, based on national, European and international partnerships.

Sally Jane Norman. Citizen of Aotearoa / New Zealand and France, Docteur de 3ème cycle/Docteur d'état (Paris III), director of the 1992 Louvre "New Images" conference and of research activities at the International Institute of Puppetry (Charleville-Mézières), Zentrum für Kunst und Medientechnologie (Karlsruhe), IRCAM (Paris), Studio for Electro-Instrumental Music (Amsterdam). As Director General of the Ecole supérieure de l'image (Angoulême/ Poitiers), she piloted a multi-million euro contract and founded a practice-led Digital Arts PhD programme, joining Newcastle in 2004 to steer Culture Lab's £4M SRIF initiative and creative interdisciplinary research collaborations. Her research spans performing arts and cultural theory: Performing arts and technology, history of scenography and evolving theatre architectures, digital tools and live art. Collaborative, interdisciplinary practice-led research, creative industries and disruptive innovation, cultural policy frameworks. Artificial life and the arts, distributed creative communities, emergent culture tuned to today's tools and practices.

Pasqualina Perrig-Chiello is a professor at Institute of Psychology of Berne university. Studies at the University of Fribourg, post-doc researcher at the University of Colorado, Boulder, CO, USA, and at the University of the Saarland, Saarbrücken. Teaching appointments at the J. Wolfgang-Goethe University Frankfurt a.M., and University of Basel. Her research and teaching focus on topics of life-span developmental psychology, espe-

cially on individual differences in well-being, health and family relations over the life span. She chairs a National Research Programme on childhood, youth and intergenerational relations and acts as a board member of the Swiss National Research Council (Swiss National Science Foundation) and of the Standing Committee for the Social Sciences of the European Science Foundation, Strasbourg. She is also Consulting Editor of the *European Journal of Ageing*. Moreover, and a member of the Scientific Board of the *Swiss Journal of Psychology* and the Scientific Board of the *Zeitschrift für Gerontologie und Geriatrie*. Author of over 200 scientific publications (www.entwicklung.psy.unibe.ch/content/team/ppc/index_ger.html).

Marcel Tanner obtained a PhD on medical biology from the University of Basel and a MPH from the University of London. He is Director of the Swiss Tropical Institute and Professor of Epidemiology and Medical Parasitology at the University of Basel and at the Federal Institute of Technology. Since 1977, his research ranges from basic research on the cell biology and immunology of malaria, schistosomiasis, trypanosomiasis and filariasis to epidemiological and public health research on risk assessment, vulnerability, health impact and district health planning. His research, teaching and health planning expertise are based on substantial long-term experience from working in rural and urban areas in Africa (mainly Tanzania, Chad, Burkina Faso and Côte d'Ivoire) and Asia (China, Thailand, Laos). He also acts as advisor to various national and international agencies, boards and committees such as the WHO/STAC-TDR, DNDi, Wellcome Trust, INCLEN-Trust.

Brian Wynne is Professor of Science Studies at CSEC and at the ESRC Centre for Economic and Social Aspects of Genomics (CESAGen). His education includes MA (Natural Sciences, Cambridge 1968), PhD (Materials Science, Cambridge 1971), MPhil (Sociology of Science, Edinburgh 1977). His work has covered technology and risk assessment, public risk perceptions, and public understanding of science, focusing on the relations between expert and lay knowledge and policy decision-making. He was an Inaugural Member of the Management Board and Scientific Committee of the European Environment Agency, (EEA), (1994-2000) and a Special Adviser to the House of Lords Science and Technology Select Committee Inquiry into Science and Society, (March 2000). He is also a member of the London Royal Society's Committee on Science in Society. Research interests: Technology and risk assessment, public risk perceptions, public understanding of science, focusing on the relations between expert and lay knowledge and policy decision-making.

Abstracts: keynotes

Thursday, 27 November, 11:15-12:00, GEP Pavillon

Why Problem Framing is a Problem

Keynote 1: **Brian Wynne** (CESAGen, Lancaster, UK)

Disciplinary knowledges have become problematic as foundations or inputs to policy, in part because no user's problems fit naturally with the ways in which any disciplinary knowledge has been framed. Disciplines are not usually so reflective about their own framing premises, and often not very flexible to challenges to such framing commitments. As Kuhn described it for scientific knowledge-practices, contingent but consistent framing commitments are an essential part of coherent knowledge. That these may not be subjectible to skeptical analysis and reconsideration is a significant problem for many such knowledges as they come to confront real knowledge-use situations in all their complexity and contestedness. All too often established knowledge cultures simply enact and effectively enforce their own framing premises with little-or-no question, and trans-disciplinary knowledge-cultures may suffer in similar terms unless deliberately encouraged to engage in such reflective practices. I will discuss what kinds of incentives might be established to do this, and what benefits can be derived from doing this.

Thursday, 27 November, 13:00-13:45, GEP Pavillon

Social Integration – A Matter of Age and Gender

Keynote 2: **Pasqualina Perrig-Chiello**

(Institute of Psychology, Bern, Switzerland)

Social integration and participation are of major concern to social scientists. Social integration describes the amount of adaptation and involvement of persons in different social systems such as family or community. Societal realities have a strong impact on possibilities and barriers of social integration. The ongoing changing social changes such as the increasing individualisation of life courses and the pluralisation of values, roles and lifestyles have brought more degrees of freedom but also an increasing disorientation associated with a higher risk of marginalisation. This is true for all ages, but especially for old age. It is known that old age is a period of life, which contains an increased risk of fragilisation and loss of functional autonomy, which is associated with a higher threat of social isolation and loneliness. Therefore the maintenance of independence and the fostering of social integration has become a high priority public health issue in research and practice.

The interest in promoting autonomy and social integration until very old age is not only related to the demographical changes, it has also psychosocial reasons.

a) *Overestimation of autonomy in our society*: Establishing and maintaining autonomy is a highly valued goal in western society and therefore a central developmental task throughout an individual's life-span – thus a loss of autonomy is individually perceived as a painful and sorrowful experience. b) *Lacking social resources*: In our society social networks and family ties are not as solid as they used to be in the past – therefore very often in old age a loss of autonomy leads to social isolation and finally institutionalisation, which is especially true for women. c) *Negative stereotypes of old age (ageism)*: Finally, the fact that in our society old age is still heavily associated with negative stereotypes (Anti-ageing-society), represent a latent threat of social marginalisation. There is empirical evidence that older persons have to overcome substantial obstacles in everyday life (such as in traffic, new technologies, etc.) or are discriminated because of their age and gender belonging (e.g. over- or undermedication in women).

We can thus infer that social integration but at the same time autonomy and self-determination are closely related to psychological well-being and can be considered as a core conditions of successful ageing. However there are large individual differences in dealing with this area of tension between these two priorities, which are still not fully understood.

In conclusion, we can say that there is undeniably a need for action on different levels (see Pohl & Hirsch-Hadorn, 2007). On the level of system knowledge a crucial question is, what are the mechanisms leading to social exclusion of elderly people and what are the resources that empower them to participate in our society. On the level of target knowledge it would be important to know, which groups are especially at risk. Unfortunately, the answer to this question is very often based on ideologies or beliefs, rather than on research-based knowledge. What we can observe in fact is that very often scientific and practical approaches in mental health are biased in multiple ways. Too often, depending on age, sex and cultural belonging, certain groups or topics are neglected and others are favoured. Finally on the level of transformation knowledge, it would be important to define, install and evaluate principles of a good practice in social integration in old age.

Approaches in Problem Framing in Health Research Development

Keynote 3: **Marcel Tanner**

(Swiss Tropical Institute, Basel, Switzerland)

An increasing proportion of the population is excluded from health care. Moreover, their living conditions, socio-economic situation and nutritional status significantly increase their vulnerability and susceptibility to disease. Rural-urban migration results in complex transitional epidemiological disease patterns. The lack of access to health care leads to a vicious circle of continuing impoverishment and desolation. In order to meet the needs of disadvantaged population groups, a review of the scientific bases, innovative approaches and new, adapted strategies are needed to assure health services delivery and health promotion to be more equitably.

The traditional approach of defining and measuring determinants of diseases/conditions or identifying those most in need entails the application of the risk concept. Risk factors are qualitatively described and measured by analytical epidemiological approaches. Consequently, risks are quantified from the basis for evidence-based planning of health interventions. The risk concept, although highly effective to target determinants of disease transmission and impact, lacks the understanding of the context of risks, i.e. no longer allows seeing the risk factors in context. The concepts of vulnerability and resilience have a potential to well complement the risk approach. Adopting the basic frameworks of vulnerability and resilience, we have developed an approach that aims at (i) reconciling the risk and vulnerability/resilience concepts and at (ii) applying in health research and planning.

Effectively reaching vulnerable population groups consequently entails the combination of epidemiological, environmental, social and cultural perspectives emphasising gender within the analysis and application of risk and vulnerability/resilience concepts. We have validated this new approach in health research and health planning in various social and cultural settings and will present how this new approach in problem framing (i) ensures that relevant research on health, well-being and poverty alleviation can be undertaken, (ii) that its results will have a high probability of being subsequently and successfully translated into public health actions that also reflect the solutions that are generated by the beneficiaries and, (iii) this in turn will result in activities and interventions with a high chance of being adequate, accepted, affordable and, thus, sustainable.

Learning and Knowing for Change: The role of intermediate concepts in land use research

Keynote 4: **Bernard Hubert** (INRA, Paris, France)

We focus on collective action situations between heterogeneous stakeholders (Cerf, Teulier 2002) for which we give the following definition: “These situations mix various actors belonging to different institutions which can assign different issues to the project, they mix designers and final users with various expertise which all are needed to carry out the design task”. The main characteristics of the collective management of such complex situations are identified through the study of three case studies in France:

- A post-fire landscape management initiative in the Cévennes hills that involved foresters, farmers, hunters, Mayors, Members of Parliament, researchers, and firemen over a period of nearly 20 years after the great 1985 fire that destroyed more than 4,000 hectares.
- Integrated catchment management around Vittel mineral water. Between 1991 and 1999, this management initiative allowed the maintenance of dairy farming over a 3,000 hectare area in the watershed while ensuring low nitrate levels compatible with the requirements of mineral water production.
- Ecological restoration efforts at Grand-Lieu Lake initiated in 1980 and continuing to this day. The initiative involves governmental agencies, farmers, fishermen and environmental non-profit organisations.

The rural situations presented here are case studies particularly appropriate to the observation of these characteristics. Because they involve a heterogeneous set of stakeholders, the conflicts are expressed more openly and reveal processes that are often so interconnected as to make them invisible. The lessons we learn from these situations regarding the process of collective development are applicable to a wide variety of situations, particularly those involving partnerships between large organisations or even within a single organisation.

Heterogeneous situations between independent stakeholders can thus be characterised by the following:

- individual interests appear in conflict with collective interests until a worsened stage is reached where all individual interests are affected or threatened.
- The solution is obviously concurrent: all stakeholders are affected or threatened concurrently. A ‘sign’ that is interpreted as an immediate or expected threat to all makes its appearance.
- Design processes are collective and spread-out over time; there is no ready-made solution.

- Stakeholders from various worlds of interest are very independent. Their links prior to the situation's initiation, when the problem had not yet clearly emerged, were nearly invisible because they share in their daily life a common territory.
- The independence between stakeholders means that they are free to exit the collective design process at any point in time.
- But they are also very interdependent due to their local interactions around numerous other stakes.
- Their social positions are usually very unequal and associated with the knowledge they hold or apply. Those holding institutional knowledge are not the ones most committed to the knowing process.

These situations often generate conflicts because of stakeholder involvement in the management of increasingly scarce and sought-after resources. Stakeholders interact in a new context in an arena “owned” by a variety of participants who find meaning in the situation as well as giving it meaning. Within a rich historical context, complex group dynamics often bring stakeholders to a crisis stage prompting them to collectively design a brand new situation. The design process brings stakeholders closer to a resolution of the crisis and to a modification of activities around a negotiated collective interest that can satisfy individual interests and practices.

An analysis of the collective action among heterogeneous stakeholders involved in the ecological restoration of Grand-Lieu Lake, in the landscape management project in the Cévennes, and in the Vitel catchment management initiative, allows us to characterize complex situations of collective management as design situations. The analysis reveals how stakeholders developed what we have identified as “intermediary concepts” and how these assisted them in successfully engaging in a collective design process. In this paper, we discuss the value of the notion of “intermediary concept” to a researcher observing and analysing a situation as well as to stakeholders involved in a situation.

Friday, 28 November, 09:00-09:45, GEP Pavillon

Cultural Change: The art of shifting goal posts

Keynote 5: **Sally Jane Norman** (Culture Lab, Newcastle, UK)

Cultural change is wrought by the shifts in shared perspectives whereby new values systems are forged and collectively assimilated. Its causal processes may be sudden and spectacular, for example when change occurs in the context of major political upheaval; transformations may also come about as part of a gradual, seemingly natural evolution over time. My presentation deals with the specific form of cultural change that is essentially related to and induced by networked digital technologies, and with how such change might be framed so we can better understand,

guide, learn and benefit from it. In this domain, factors that complexify our readings of systems, target and transformation knowledge include:

- the recent, radical, global yet diversely distributed nature of information technology;
- steady swings in thinking about development processes, away from strictly technologically-defined drivers and associated discourses of anonymous mass empowerment, towards human-centred, individually customisable tool design;
- increased focus on inclusive, participatory digital systems in response to a) social demands for their ready identification, adaptation and appropriation, b) fear of economic backlash ensuing from consumer/prosumer rejection of market dictates;
- the consequent need to integrate broader sociological, psychological and ethnomethodological parameters and methods of legitimation into development processes previously considered as exclusively technologically driven.

Discussion of these issues is anchored in pragmatic experience of two kinds of initiatives:

- 1) projects spanning approximately ten years conducted in the context of the European Framework programme strand first labeled IT (Information Technologies) then IST (Information Society Technologies) as part of a re-branding exercise that in itself constitutes a significant shift in problem framing for digital R&D, and
- 2) projects underway in Culture Lab, a unique creative practice-led digital laboratory recently inaugurated at Newcastle University, where stakeholders from multiple disciplines are brokering new ways of jointly shaping know-how and corresponding digital technology resources.

My presentation bears a wilfully ambiguous title: if shifting is read as a verb, it designates the art whereby we ourselves actively shift the goal posts we use as references when viewing the world, in other words, the art of actively reframing our views in order to bring about cultural change. If shifting is read as an adjective, the title designates a more elusive art where autonomous goal posts are themselves apt to shift, offering a less manageable reference system for our world views. Given our remit to study problem framing, this ambiguity begs a seemingly generic question, namely that of how we consider the goal posts or reference systems in which values are grounded. Where on the continuum ranging from the compliant to the intractable do we position the determinants of cultural change?

Approaches to the three forms of knowledge defined by Pohl and Hirsch Hadorn are largely conditioned by this question, insofar as the extent to which we consider goal posts or values systems as amenable to change determines how much effort must be devoted to systems, target and transformation knowledge. Equally importantly, it determines how that effort

might best be phased: appropriate time frames for assessing these interdependent forms of knowledge may vary considerably, so part of the art of shifting goal posts consists of coherently phasing these temporal differences. My paper reviews some of the ways cultural visions enrich and complexify collaborative research projects seeking to develop new digital resources. It looks at tensions that arise when cultural policy is too exclusively harnessed to short-term economic drivers, as in much creative industries discourse, and at the profound kinds of change that can transform *communitas*, understood as an “unmediated relationship between historical, idiosyncratic, concrete individuals” (Victor Turner) in the specific, ostensibly gratuitous cultural realm of art.

Abstracts: Workshop and paper sessions

Slot I (parallel sessions): Thursday, 27 November, 14:00-15:30

Workshop session 1: room: STW 1

Problem Framing in Transdisciplinary Case Studies on Sustainable Development

Organizers: *Roland W. Scholz*, *Michael Stauffacher*, *Daniel Lang*, Institute for Environmental Decisions – Natural and Social Science Interface, ETH Zurich, Switzerland and *Alfred Posch*, *Clemens Mader*, *Gerald Steiner*, Karl-Franzens-Universität Graz, Austria

Discussants: *Stephen Morse*, University of Reading, UK and *Thomas Jahn*, *Florian Keil*, ISOE, Frankfurt, Germany, *Ulli Vilsmaier*, University of Salzburg, Austria

In 2002 we have set up the *International Transdisciplinarity Net on Case Studies for Sustainable Development* (ITdNet) with a view to exchange and further knowledge and experiences about transdisciplinary case studies as methodological approach for learning applied research in a transdisciplinary setting. Since then we are holding annual meetings and are organising specific training workshops to exchange detailed information. In 2005, we organised a special session at the 11th Annual International Sustainable Development Research Conference and in 2006, we published a special issue of the “International Journal of Sustainability in Higher Education” on “Applying transdisciplinary case studies as a means of organizing sustainability learning”.

For the upcoming “Transdisciplinarity Conference 2008”, we propose to organise a workshop bringing together our members from the Karl-Franzens-University of Graz, BOKU Vienna, Leuphana University Lüne-

burg, Chalmers Gothenburg, Humboldt University Berlin and further interested experts to discuss issues of problem framing in the context of our transdisciplinary case studies.

We would like to discuss the problem framing phase in transdisciplinary projects from the following perspectives:

- How can science choose – based on a thorough review of existing knowledge and serious gaps in a variety of fields – which questions are worth to be tackled from a scientific perspective and necessitate a transdisciplinary approach?
- How can society organise a process – maybe initiated and facilitated by science – to select among all those more or less pressing societal problems expressed by different stakeholder groups the specific problem worth the effort for a transdisciplinary cooperation with science?
- How can then science and representatives from outside academia design a joint process to frame and define the problem in such a way that the transdisciplinary project has the potential creating valuable results for both sides?

Answering these questions, we will combine presentations of case experiences with more theoretically driven inputs. We expect at least six presentations from different countries and will allow enough time for in-depth discussions of the short paper presentations.

Paper session 1.1: Health; technology assessment (TA)
room: STW 2 | chair: Elisabeth Zemp

1.1.1

Shifting the Problem Frame – Shifting the Frame of Science: A close view on the methodology of technology assessment

Richard Beecroft, Institut für Technikfolgenabschätzung und Systemanalyse (ITAS),
Forschungszentrum Karlsruhe, Germany

Background: *Technology assessment* (TA) is a field of research which is focussed on an issue of high social relevance: understanding and assessing the impacts – both expected and unexpected, wanted and unwanted – of science and technology. The TA claim is not only to analyse these issues, but also to contribute to adequate solutions. Therefore, TA can be understood as a typical *transdisciplinary* approach.

Although the idea of TA was first formulated in the context of scientific policy advice, over the past 40 years several very different concepts of TA evolved. All of them criticise the so called “classical TA” approach (and usually the other approaches as well) under their specific premises, each offering a distinct set of methodological principles for a supposedly better TA. As the understanding of the fundamental problems varies among the concepts, their development can be reconstructed as a process of *shifting the problem frame* in the course of methodological developments.

Scope of this contribution: Following these shifts of the problem frames, my contribution to the conference will analyse the following thesis: Every problem frame is closely linked to a position of TA, to a frame of the scientific practice itself. *Problem frames and TA frames are structurally interrelated.*

- The *classical TA* approach frames the problem as one of urgent need of information supply in political decision making. Expert advice is considered as the best solution at hand (maybe even the ideal) to meet this need, TA itself remains in a distanced, objective position.
- The *participatory TA* criticises the classical concept as being expertocratic and therefore includes laypeople participation into the TA processes. The problem is framed as one of democratic deficits concerning technology; the position of TA is right in the middle of the democratic process, rather supporting the discourse with stakeholders and laypeople than offering expert advice.
- *constructive TA* criticises both approaches as a) coming to late, since the possible influence on a technology is highest in the stage of its development, and b) reducing all the options of shaping science and technology to few alternatives for political decision. Therefore, constructive TA frames the problem as one of shaping evolving technologies. The position of TA shifts to contributing social aspects to specific research projects or to supporting the embedment of new promising technologies.
- *rational TA* argues that all other concepts ignore the need for value judgements (or include them intransparently), whilst the public debate on fundamental issues related to technology is neither adequately informed nor rational. The problem is seen as one of fundamental ethical questions and inappropriate discourses. TA is framed as ethical reflection, enlightening the discourse from a distanced perspective.
- Other TA concepts focus on other problems: *innovation and technology analysis* is based on the economic need for innovation; the responsibility of scientists for their research is the starting point of *prospective TA*; *cultural TA* (kultur- und sozialwissenschaftliche TA) analyses technology as part of every day life.

Today, the methodological discourse of technology assessment is beyond the stage of mere mutual criticism. The scientific community is searching for a common methodology that covers different concepts. The central question of this debate is momentarily, which concept to use for which specific problem.

My suggestion is not to reduce the focus on the *problem*, but to include the question in which role TA is needed in the *social and political context*: Problem frames and TA frames have to be considered together.

Contribution to the conference topic: This contribution is a general approach to problem framing, therefore relevant for the open session. It is

supposed to offer an understanding of transdisciplinary science as being in the middle of social decisions, but still not tied to one specific frame. An analysis of the different TA concepts shows, how the position of a transdisciplinary project can and should be framed in accordance with the problem frame.

1.1.2

Methodology of Transdisciplinary Research:

Example Robotics in Health Care.

A 2-Step Problem Framing for Transdisciplinary Technology Assessment

Michael Decker, Institute for Technology Assessment and Systems Analysis (ITAS), Forschungszentrum Karlsruhe, Germany

Technology Assessment (TA) is characterised as ‘problem-oriented research’: Solutions for a political, ecological, social problem have to be developed. In the framework of the EU project “Technology Assessment in Europe: between Methods and Impact” (TAMI) a structure has been worked out how to analyse these problems taking technical, political and social aspects into account. This orientation on lifeworldly problems is the reason why TA is also being seen as a paradigmatic area of application of transdisciplinary research.

From the viewpoint of a TA practitioner this problem analysis proves to be necessary since a solution for this problem has to be developed and some kind of “problem solving potential” has to be demonstrated for the design of a concrete project. To deal with this political, ecological, social question in the framework of the project, it also has to be transformed into a problem that can be treated in an inter-/transdisciplinary way. Therefore it has to be outlined which scientific disciplines develop relevant contributions to the problem solving in which way. How and for which purpose should stakeholders or citizens be involved by participative methods?

This article proposes a two-stage problem framing, starting with the “broad” political, social way of looking at the problem. The aim of a TA is then determined on the basis of this analysis with regard to the impact that should be obtained with the social, political debate and the kind of problem solving that should be developed. These two aspects, the basic problem and the derived research objective are being used to justify the relevance decision for a particular TA project. Which scientific disciplines should be involved in which way and which should not? Which forms of participative generation of knowledge are being applied? How will these different fields of knowledge be combined within the process? Questions like these will be answered with reference to the problem and the research objective.

A TA project on robotics (field of application: health-care-taking) will exemplify this. Based on the thesis that robots are generally developed to perform tasks that have so far been carried out by human beings the question of “replaceability of humans by robots” has been raised in this project. First of all this question is presented according to the TAMI structure. The second part describes the transformation of this question into a problem that can be examined in a transdisciplinary way, aiming at an analysis of the technical, economical, legal and ethical/social replaceability of the human being.

1.1.3

How to Avoid Adverse Events in Healthcare? Towards a transdisciplinary approach to patient safety

Katja Stoppenbrink, Europäische Akademie zur Erforschung von Folgen wissenschaftlich-technischer Entwicklungen Bad Neuenahr-Ahrweiler GmbH, Germany

Since in a series of landmark studies in the 1990s (Harvard Medical Practice Studies, Brennan 1991, Leape 1991; Quality in Australian Health Care Study, Wilson 1995) the prevalence of threats to patient safety has been revealed, the problem has been on the agenda of healthcare providers and policy-makers worldwide. In Germany, a country in which research into patient safety is lagging behind, in February 2008 the German Medical Association (*Bundesärztekammer*) and the Action Group for Patient Safety (*Aktionsbündnis Patientensicherheit*) issued a joint press release and brochure entitled “Aus Fehlern lernen” (*Learning from mistakes*). For the first time ever, German doctors, nurses and other healthcare professionals confessed their errors and malpractice experiences along their careers, thus causing a sensation among their colleagues and attracting a great deal of public attention (cf. Becker/Zander 2008). In their brochure they appeal to the public to help to “detect safety gaps in the system” and establish a “blame-free culture” in healthcare. However, prior to publication all authors have taken care to obtain legal clearance so as to avoid any risk of medical liability litigation. This reveals the “medico-legal responsibility dilemma”: Who can be held accountable if the system is to blame? Does the emphasis on the contributive causal factors of the system give rise to moral hazard and self-exculpation by healthcare professionals (cf. Christakis 2008)? How can adverse events in healthcare best be avoided?

Patient safety is a prime example of a problem requiring a transdisciplinary framing to be adequately tackled. Sociological and psychological research has contributed to a better understanding of “the human factor” and the complex combination of active and latent failures in the causation of harm to patients (e.g. Reason 2000, Shortell/Singer 2008). A broad con-

sensus has thus emerged that creating an organizational safety culture is one of the key issues to prevent risks such as infections, surgical and diagnostic mistakes, adverse drug events or errors involving medical equipment (Walshe/Boaden 2005, Sandars/Cook 2007). Whereas in other high-risk activities such as aviation voluntary and non-punitive reporting systems for “near misses” (such as “near collisions” of aircraft) have been in place for decades, in medicine, it has for a long time been a taboo to admit errors and acknowledge mistakes (Helmreich 2000). The gradual shift in the doctor-patient relationship from an asymmetrical principal-agent model to a more symmetrical image of informed customer and responsible medical service provider resulted in an increase in medical malpractice complaints and claims in arbitration procedures and the courts (Brazier/Cave 2007; Bundesärztekammer 2008).

However, the sole focus on individual responsibility and legal redress does not offer an adequate answer to patient safety problems. In order to avoid that patients suffer harm in the first place, it is necessary to combine a systems approach in which the healthcare institution is regarded as a “learning organisation” (cf. Department of Health 2000) with strategies to improve clinical risk management, team performance and communication (e.g. through increased use of information technology). Thus, normative target knowledge (rules in the form of procedures, protocols and guidelines specifying individual duties) has to be supplemented with transformation knowledge to ensure patient safety. Rules alone cannot be an appropriate means because they are not effective unless they are known, understood and implemented by the healthcare professionals supposed to comply with them. The provision of safe, effective and efficient healthcare is a complex challenge which can best be met by the adoption of a transdisciplinary approach to quality and patient safety integrating a broad range of stakeholders from researchers over healthcare professionals to patients and the general public.

Paper session 1.2: Health; violence; Africa

room: HG F 33.1 | chair: Bernard Hubert

1.2.1

Unpacking the “Black Box”: Charting the dynamics of problem framing in a transdisciplinary research effort to reduce infectious disease in Sub Sahara Africa

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The literature on transdisciplinary research is replete with suggestions that its scholars/researchers must develop a common meta-level cognitive

frame or shared conceptual framework (Hirsch Hadorn et al., 2008; Rosenfield, 1992). But authors in this literature provide little insight into how scholars go about doing so. That is, the transdisciplinary research (TDR) field lacks a nuanced understanding of the processes analysts and researchers employ to attain this goal. The field also lacks much information that examines how and why such processes are being undertaken. This analysis begins to address that gap by observing closely the dynamics of choice making and problem framing of one transdisciplinary research team engaged in developing an effort aimed at reducing infectious disease in Sub Sahara Africa. The paper explores the intentions, planning dynamics and lessons learned from that project team's experience as it has tackled the conceptual challenge of TDR problem identification and structuring.

Two Virginia Tech research institutes, the Virginia Bioinformatics Institute (VBI) and the Virginia Tech Institute for Policy and Governance (VTIPG) are conducting a research effort with the ultimate goal of reducing infectious disease in Sub Saharan Africa. This research team quickly had to confront the difficult issue of how to begin designing a shared set of transdisciplinary aspirations. The group soon encountered several paradoxes in its efforts. For example, while project structuring is contingent upon problem identification, the reverse is also true. Similarly, selecting partners is partially dependent on the way a problem is framed, but TDR requires that key partners be involved in problem selection and definition.

Problem framing is a critical dimension of TDR and must be carried out with a clear eye to current and prospective partner capacities. Scholars from the two institutes have designed their project development process to provide periodic formal opportunities for active reflection on problem framing and project structuring. An essential element of this strategy is the integration of systems, target and transformation forms of knowledge. The overall objective is to design an adaptive and reflexive structure of group decision-making, an evolving process of problem framing that can adjust as members garner new insights and perspectives and develop additional capacities.

This paper analyzes the team's experience with this evolving process to highlight the endemic challenges implicit in creating a shared conceptual frame for TDR. The aim throughout is to use this team's experience to illuminate key concerns in creating processes of decision-making for TDR while also helping future researchers conceptualize better the principal intellectual and group dynamic concerns they will likely confront as they seek to create a shared vision of purpose.

1.2.2

Health Interventions to Nomadic Pastoralists in the Sahel

Anna Münch, Office of Population Research, Princeton University, USA

A society's needs and the indigenous risks it faces, cannot be identified by either biomedical rationality or taking a socio-cultural approach alone. For this reason, local health determinants in the nomadic milieu have to be ascertained and interpreted with the aid of interdisciplinary research methods, combining clinical and epidemiological studies with their socio-cultural and linguistic counterpart. Methodological bridges need to be built, not only between the humanities, social sciences and natural sciences, between North and South, but also between research and development as a transdisciplinary process in the dialogue between science and society.

Systmes knowledge: At the mercy of harsh ecological and economic environments, nomadic societies are repeatedly forced to migrate and relocate. Their mobility, their proximity to and dependence on their livestock, a traditionally dairy-rich diet and arid habitat leave pastoral societies exposed to a variety of health risks reflected in one of the highest infant mortality rates of the world: up to 28 % of children in the Azawad-region of Northern Mali die before their fifth birthday. Immunisation programs often don't reach the nomadic population, and infectious diseases are regarded as the greatest health problems.

Target knowledge: Most of the sahelian countries' community based healthcare services are not geared to the nomads' mobile lifestyle, and the socio-cultural barriers in place mean that women and children in particular have virtually no access to external healthcare facilities. Very little research has been done into their internal networks, their perception of illness, the perceived causes, their ensuing behaviour and what they envisage themselves in terms of better healthcare. Providing a precise picture of what are considered to be valid representations of sickness, diseases and their dissemination within the cultural context of pastoral societies, not only serves to fill a knowledge gap, it is also fundamental to building up a socio-cultural awareness and defining local health strategies which could help concerned authorities and organizations to develop a reliable and adapted medical care system.

Transformation knowledge: With the integrative approach of our research method, not only local illness hermeneutics are translated into other languages and thereby made comprehensible for different cultures, but also epidemiological and clinical investigations provide data about the general health status of humans and animals. The transdisciplinarity becomes most apparent in the search for correlations between cultural values, clinically identified diseases, the nomadic pastoralist's own per-

ception of illness and the national health strategy. Research results are always presented at stakeholder seminars and discussed together with the concerned population, local health authorities as well as international organizations. In workshops healthcare needs that the local population sees as a priority are jointly identified, and those priorities serve after as a basis for planning the next steps towards appropriate health strategies.

1.2.3

Surveying Armed Violence, Arms and Victimisation in Southern Sudan: Adopting a transdisciplinary approach

Robert Muggah, Small Arms Survey, Geneva, Switzerland

In order to better understand the distribution and scale of armed violence in southern Sudan, the *Human Security Baseline Assessment* undertook three victimisation surveys between 2006 and 2007. These semi-randomised household surveys – or verbal autopsies – drew from epidemiological, behavioural and social science traditions. Specifically, they were administered in Lakes state, Jonglei state, Eastern Equatoria state and the northern Kenyan region of Turkana. The surveys were designed to identify social, economic and cultural determinants of violence, direct and excess mortality and morbidity, outcomes of recent disarmament campaigns and prospects for future interventions. We concluded that while armed violence in southern Sudan has diminished overall since the signing of the Comprehensive Peace Agreement (CPA), civilians are still exposed to comparatively high levels of insecurity, including above-expected rates of mortality and morbidity. Likewise, despite evidence that it does not work, national and local authorities continue to insist on forcible disarmament as a strategy to stabilise the situation despite its considerable human cost. The article also considers the real challenges encountered in the course of undertaking household surveys in the region. Nevertheless, it demonstrates the considerable advantages of adopting a transdisciplinary approach that integrates elements of various disciplines.

Papers session 1.3: Social integration

room: HG F 33.2 | chair: Theres Paulsen

1.3.1

Problem Framing in Inter- and Transdisciplinary Children's Rights Research: Prioritising empirical and theoretical research in the systems knowledge field

Frédéric Darbellay, *Karl Hanson*, Institut Universitaire Kurt Bösch (IUKB), *Theres Paulsen*, IUKB & td-net for Transdisciplinary Research, Switzerland

Awareness for children's rights did not come out after a scientific discovery, quite on the contrary: academic recognition of the subject's impor-

tance only gradually followed the developing social attention for children's rights. As a consequence, many research questions concentrate around normative goals (target knowledge), which take the form of asking how a particular international norm, for example the abolition of child labour, can be put in practice. Also, many present theorisations within the field of children's rights originated from a social practice context and emerged out of the necessity for child rights professionals to give meaning, structure and justify their actions in the field. For example, the distinction between 'child work', 'child labour' and the 'worst forms of child labour' came into being from a normative, and not from an empirical or theoretical perspective. Research questions are all too often limited to asking how the normative framework (target knowledge) can be put in practice (transformation knowledge), whereby the uncertainties of the systems knowledge are relatively underdeveloped, leading to an unbalance between the three forms of knowledge.

Hence, within the particular context of children's rights as an emerging field of academic interest, concerning both research and education, an academic agenda for children's rights should prioritise the development of systems knowledge and engage more structurally with both empirical and theoretical studies from a basic research perspective. The overall objective of scientific research in children's rights is to advance systems knowledge, fostering social enlightenment, aimed at describing, understanding and evaluating children's rights. Albeit this research can have a positive impact on transformation knowledge and furthering respect for children's rights, its key objective is not to implement the CRC or to change the world into a better place for children. These are the primary objectives for child rights advocates and policy makers. Research findings can of course be used for legislative changes, social policy or programming. However, it is up to advocates and policy makers to make use (or not) of research findings.

The paper will address these issues first by providing a short epistemological, theoretical and conceptual outline on inter- and transdisciplinarity, its methods and potentialities in the context of the present changing organisational framework of higher education and academic research. Second, we will also take into account complex relationships between theory and practice in the frame of transdisciplinary research processes which put in interaction the scientific world and life-world actors, including children themselves. Third, we will present the application of these principles in the emerging and multidimensional field of children's rights. Notwithstanding the growing concern for children's rights as a field of academic interest, there is no common theoretical outlook for the study of children's rights. To get hold of the complexity of the subject, an inter- and transdisciplinary approach to children's rights will be advocated, bor-

rowing theoretical and methodological concepts and ideas both from established disciplines, such as law, sociology, pedagogy, social work or psychology as well as from neighbouring study fields, including childhood studies, human rights studies and (inter)generational studies.

1.3.2

Mixing Qualitative and Quantitative Methods: Opportunities and problems in social integration research

Dean Barker, Markus Gerber, Natalie Barker-Ruchti, Uwe Pühse, Institute of Exercise and Health Sciences, University of Basel, Switzerland

In this paper we discuss the possibility of Mixed Methods Research (MMR), or combining quantitative and qualitative research methods, with respect to an investigation of sport and social integration of Swiss youths. Briefly, participation in sport has been attributed a number of pro-social benefits including the ability to produce social integration. Yet the confidence in sport to deliver integrative outcomes that many advocates (teachers, coaches, organizations, policy makers, and funding agencies) display is commonsensical and idealistic. It is neither based on, nor supported by, empirical or theoretically-oriented understandings of culture, sport or integration. The aim of the project is to investigate whether, how, and under what circumstances sport might make a contribution to the social integration of Swiss youths with a migration background. The three specific questions that guide the investigation are the following: (1) how does sport participation influence the social integration of migrant adolescents in Switzerland? As sub-questions, (a) what are possible barriers that prevent migrant adolescents from participating in sport? And (b) what factors might prevent sport participation leading to social integration? (2) Do differences between non-migrant and migrant sport participation exist? And (3) can the social integration of migrant adolescents be improved through an intervention specifically aimed at increasing integration through sport participation?

An MMR approach was required for the pragmatic reason that the researchers involved in the investigation brought with them both qualitative and quantitative research backgrounds and have had significantly different inductions into the field of social sciences. Working mono-methodically would have meant the abandonment of a set of research skills. At the same time, an MMR approach appeared to offer a number of opportunities that related to the questions that could be asked and the insight that could be gained. After an initial phase of framing and re-framing the research, however, we discovered that MMR is a complex process. It requires careful consideration of basic assumptions and is potentially problematic, a point that is reflected in the serious and persistent critique that MMR has

faced. A number of theorists have argued, for example, that bringing quantitative and qualitative methods together in one research project is impossible because the two categories of methods are founded on opposing principles. Others have claimed that MMR is not impossible but that it could certainly be done more thoughtfully. In this paper, we discuss a number of considerations outlined in the literature and show how these issues relate to our research practice. We then go beyond this discussion to illustrate our attempts to conduct MMR in a considered and productive manner and in the process offer suggestions for further employment of a Mixed Methods approach.

1.3.3

Systemic City Governance: Design and application of a generic governance frame (GGF)

Ralf-Eckhard Türke, Public Management Center of Excellence, University of St. Gallen, Switzerland

Today, governments on all levels face accelerating societal changes and instability while at the same time confronting pressures to improve the effectiveness and efficiency of their service delivery. Research is conducted world-wide to find ways and means for coping with these challenges. This presentation/ paper reports on a transdisciplinary research between the disciplines of public governance/management, cybernetics and synergetics. The primary objective is to attend to governance from the perspective of fundamental principles and to formulate a comprehensive notion of governance. Thus, it is contributed to the field of governance research in the following ways: First of all the foundation for a generic theory of governance is assembled based on first principles of cybernetics and synergetics. That generic theory enables a holistic, comprehensive understanding of social systems based on fundamental laws. From that generic theory, a framework is derived that enables a broad application of the identified principles in different governing contexts. Thus, a theoretical and methodological contribution to the field of governance is provided. Second, the framework is applied in case studies of the city of Baltimore, USA and the city of Baden, Switzerland. Thus, it is added to a hot topic of the current scientific discussion in the Public Management scene, i.e. the topic of "Performance measurement in city governments". Third, the generic governance framework is applied in a second practical case study on the city of Baden's governing structures. Here, a comprehensive sketch on the cities' established structures and their strength and weaknesses is derived. Based on the results we will then provide the city government of Baden with recommendations for improving their prevailing structures.

The conference presentation/paper will present the concept and preliminary results of this ongoing research project. Within that presentation it will be shown how the derived transdisciplinary governance framework enables comprehensive problem framing in highly complex social system contexts.

Paper session 1.4: Nano; GM plants; sustainability
room: HG F 33.3 | chair: Brian Wynne

1.4.1

Cultures in the Regulation of Science and Technology: An interdisciplinary view on agricultural biotechnology and nanomaterials in Europe and the US

Monika Kurath, Program for Science Studies, University of Basel; Collegium Helveticum ETH/University of Zurich, Switzerland

Using the analytical concept of regulatory cultures (Jasanoff 1995; Jasanoff 1997; Jasanoff 2005), this article focuses on a comparison of the regulation of science and technology related aspects in Europe and the US. By analyzing the politics and governance of agricultural biotechnology and nanomaterials in different regulatory cultures, I will use an interdisciplinary or transdisciplinary (TR) approach. From the three forms of TR related research questions and types of knowledge by (Pohl and Gertrude 2007); my approach would soonest fit in the category of systems knowledge. With my STS-based research approach, I will observe and analyze a situation, however I am not judging existing conditions or work on the possibility of transforming them as Pohl and Hirsch Hadorn characterized TR questions in (2007).

Analyzing both, governmental activities like the legal framing, voluntary programs and research funding activities as well as external approaches – subsumed under the term governance (Lengwiler and Simon 2005) – from science, industry and civil society, I observed that governmental responses to emerging science and technology fields in Europe and the US such as agricultural biotechnology and nanomaterials have shown intrinsic similarities not on a material level but of the legal framing and the political culture. In the US, in both fields governmental responses have mainly been based on applying the existing regulatory framework by using a substance equivalence and preventive approach. However, in the case of nanomaterial regulation, new alliances of government external actors have emerged. In applying a voluntary risk management scheme for manufacturers, a corporate-environmental advocacy group alliance suggests a more precaution-oriented approach. In Europe, governmental responses also focus on the applicability of the existing regulatory frame-

work, however the related activities have intrinsically been shaped by a precautionary-oriented approach. I will conclude that in the case of complex science and technologies, such government external actors with a strong link to science or industry might increasingly become substantial parts of regulatory cultures, particularly in preventive-oriented ones.

1.4.2

Scenario Building Workshop: Interplay of problem framings

Rolf Meyer, Martin Knapp, Institut für Technikfolgenabschätzung und Systemanalyse (ITAS), Forschungszentrum Karlsruhe, Germany

Cultivation of GM plants is an important conflict area in European land use. In the past, discursive technology assessment activities on this topic – as stakeholder discourse, consensus conference, citizens’ jury, public meeting, and public debate - took place in different European countries (e.g. citizens conference in France 1998, consensus conference of Danish Board of Technology 1999 and Norwegian Board of Technology 2000, publiforum of TA Swiss 1999, citizens jury of Danish Board of Technology 2005). They were focused on the first generation of GM plants (with herbicide tolerance, and insect resistance) and current debate issues. In contrast, the future of GM plants is described mainly in vision papers of scientists and developers.

The building of scenarios is in most cases a scientific exercise, partly with feedback from stakeholders. In the project “Scenario building workshops – Futures of green genetic engineering” of the Institute for Technology Assessment and System Analysis (ITAS) and the Berlin-Brandenburgische Akademie der Wissenschaften (BBAW), scenarios are worked out by laypersons (students and scholars). Different problem framings – as a diversity of perspectives – are needed so that the workshop participants can discuss and elaborate alternative future developments of GM plants. Further, scenarios represent divergent perspectives of actors and developments of framing conditions. In the whole process, an interplay of problem framings takes place.

In preparation for the workshop, baseline information (so called “fact sheets”) is drafted by the project group, including a broad number of topics with different disciplinary backgrounds and assessments of important social actors. Reviews by scientists and stakeholders are part of the drafting process, to make sure that different problem framings and assessments are included and described without bias.

The aim of this exercise is to create a common point of departure for the workshop participants and to enable a fair discourse process in the workshop. During the scenario building workshop, the different problem fram-

ings are taken up by the participants and underlain with their own perception and knowledge. The expectation is to achieve a broader and different description for possible future developments of GM plants in Germany (or Europe, respectively) as can be expected in a scientific project.

The results of the scenario building workshops will be a contribution in the debate on the further direction of research in the area of green genetic engineering, opening the possibility to confront the problem framing and perspectives of scientists with the problem framing and future assessment by laypersons.

1.4.3

Sustainability Goal Conflicts as Problem-Framing Figure in Technology Assessment

Marc Dusseldorp, Institut für Technikfolgenabschätzung und Systemanalyse (ITAS), Forschungszentrum Karlsruhe, Germany

Background: Technology assessment (TA) considers itself as a form of transdisciplinary research: It analyses and assesses the (side) effects of the development and use of new technologies on society and the global eco system, with the aim of contributing to societal problem solving related to science and technology – a task which essentially requires the integration of heterogeneous bodies of knowledge. As in transdisciplinary research in general, problem framing plays a crucial role in the process of TA projects.

When considering problem framing, its normative dimension is of special interest: It addresses the question of how the value basis of a study can be justified (i.e. for example, what shall be considered as a relevant dimension of the issue). This question is controversial in many cases, but it predetermines other central aspects of problem framing, namely which information, methods, perspectives etc. should be involved in which manner.

Focus of the paper: In this paper, I consider goal conflicts as a typical figure of problem framing in TA which especially concerns the normative dimension of problem framing. The case of sustainability goal conflicts – sustainability understood as a normative notion which can be operationalised, a view which is common in TA – can be seen as a paradigmatic case for this figure. Conceptually, the figure of sustainability goal conflicts is closely related to the figure of goal conflicts in classical decision analysis, although they show a fundamental difference: Here, the task is not only to choose the “best” alternative, but to justify the use of a multidimensional normative notion such as “sustainability”.

In some essential points, this figure is different from other figures that address the normative dimension of problem framing in TA: Whereas for example the analysis of side effects gives the opportunity to consider po-

tential asymmetries of the stakeholders, or the investigation of moral dilemmas highlights the conflictual nature of the underlying problem, the figure of sustainability goal conflicts refers to a uniform basis for assessment, containing the idea of a consensus about the normative basis for the analysis.

This feature of the examined problem framing figure has important implications for the entire transdisciplinary research process, like the following:

- It gives science a strong role in its relation to politics and the public;
- it implies the principal separability of means and ends;
- it requires the goals to be made explicit.

These implications could both be positive or potentially problematic. To further shed light on these implications and to criticise the problem framing figure of sustainability goal conflicts are the purposes of this paper. Specific contribution of the paper to the overall conference theme of problem framing:

I focus on sustainability goal conflicts as a specific figure of problem framing in TA especially concerning the framing's normative dimension. As this problem framing figure is very popular but nevertheless problematic, its analysis promises interesting insights into the question of the normative dimension of problem framing in general.

Slot II (parallel sessions): Friday, 28 November, 10:15-11:45

Workshop session 2: room: STW 1 | chair: Manuela Rossini

Literature and Medicine in Dialogue: Narrative means

Franziska Gyga, Department of English, University of Basel, and *Alexander Kiss*, University Hospital Basel, Switzerland

The workshop will present and discuss the potential of transdisciplinary teaching and research in the field narrative medicine. On the one hand there has been an unusual increase of publications of so-called illness narratives in the past twenty years and on the other hand the awareness of the crucial role of narratives in medical communication has been growing. Both fields need to explore the various cultural and social representations of illness (and also of health) and the specific means that are used to describe the experience of illness, be it in an aesthetic and highly artistic form or in a dialogue between patient and doctor. Thus, relying on the three forms of knowledge suggested by Christian Pohl and Gertrude Hirsch Hadorn (Principles for Designing Transdisciplinary Research) we argue that possible reasons (systems knowledge) may be the increasing complex experience of illness in the wake of the biomedical approaches to illness

on the one hand and the rapidly changing ways of self-representation/self-invention (e.g. on the internet). There is a continuous need to express the experience of illness through various forms (literal, cultural, artistic on the one hand, and in medical interaction on the other). How are these experiences of illness represented/constructed in narrative, one of the key concepts for identity?

Self-invention and the formation of identity are at the core of all autobiographical if not of all narratives in general (cf. Erving Goffman's canonical work *The Presentation of Self in Everyday Life*, 1959, and Paul Ricoeur's *Time and Narrative*. Vol. III. Chicago and London: The University of Chicago Press, 1988). The more general question addresses the issue of the role of language and its various discourses (of society, culture, and medicine) and the ways in which it purports specific images of an illness.

The goals of our transdisciplinary project (target knowledge) is the need for change and better practices in medical communication: How can we understand communicative and artistic expressions of experiences of illness? How can we improve communicative skills of medical people? Insights from literary and cultural studies improve the understanding and ability for self-reflection (e.g. the role of metaphors, plot constructions, or gender constructions). The analysis of social, cultural, and medical representations of illness implies a whole range of social and cultural practices. New insights (transformation knowledge) into the cultural and social representation of illness (and meanings of health) contribute to the difficult issue of accepting ambiguities and uncertainties when dealing with illness, in particular on the side of the medical profession.

In our workshop we will present an extract from a literary work and a film in order to engage the audience in a discussion on their responses to representations of illness.

Paper session 2.1: Environment; uncertainty; art-as-research
room: STW 2 | chair: Sylvia Nagl

2.1.1

“Space-Art-Rescue”: A satellite based alarm system and disaster reduction

Melody Burke, Frank Hoppe, Satellite Art Works (S.A.W), Berlin, Germany

The mission of Satellite Art Works (S.A.W) is to create alerting devices within early warning systems to aid populations in danger from critical circumstances. ‘Space-Art-Rescue’, Art for the Early Warning System, is an investigation into how Art could give an early warning signal in times of disaster.

Closing a gap in the early warning system for disaster risk reduction glo-

bally with consideration of context, conditions, practice and policy are a priority of the research. The desired goal is to improve response to risk scenario. The introduction of a more perceptive interpretation of global responsibilities, as this relates to regional and local practices, lies at the heart of our research. We ask: “What is the appropriate mix of telemetry and technology as well as instinctive, intuitive, indigenous, traditional and local knowledge together with preparedness and community mobilisation, that would help create more disaster resilience at the grass roots?”

The origins of the research question lie in the field of climatic change, predicted mortality rate and economic loss due to increasing patterns of risk hazards. The problems for consideration here include legislation that is not current in terms of these developments and predictions. In addition, inadequate economic investment in early warning systems that are inclusive in terms of culture, education, ability, location and knowledge. Steering the common good are values pertaining to human rights as well as an awareness of global equitableness in terms of economics, politics, ecology and environmentalism.

The premise of our investigation is the creation of a de-centralised autonomous global alert warning system which is multi-capacity, non-earth bound and which offers integrity, co-ordination and sustainability. This would automatically present a shift in terms of control and personal power of action in response to a hazard scenario. A number of differing perceptions concerning approaches to disaster support management have indicated the level to which politics and economics influence the mortality rate and who is considered worthy of support and follow up mitigation action. Satellite Art Works (S.A.W) focuses on research areas which are technical, social, cultural and legal. Our Profile of Concepts Ideas, concerns innovative integrated applications to a satellite based alarm system. These multiple technological alarm extension devices over-lap and offer alert response to a continuum of disasters as part of real-time emergency management. The context of the design intention addresses issues of vulnerability and inclusiveness. The nature of ‘Space- Art-Rescue’ devices are profiled respective to their description, function, design intention, design capability, advantages, disadvantages and disaster suitability. Our abstract is written from the perspective of research relating to Space Art Practice. This is the term we give to the structure of exchange on Space Art experience in inter- and transdisciplinary framing and to better enable cross-field learning.

The core of our paper engages transdisciplinary problem framing and as a result highlights four ideas: a newly evolving value system of Fine Art Practice emerging early in the twenty first century as a result of shared global perspectives; the attribute of Art, it’s practices and methodologies

as a largely untapped force in understanding and defining solutions to earth's global challenges; thirdly, the benefits of working with a discipline that offers a high awareness, yielding a recognition in which intuition and risk thinking successfully operate. Finally, as an expanded conception of Art, examining new organs of perception, methods and activities, using Space Art Practice as the practical and systematic tool for a Soziale Plastik (Social Sculpture) approach within the field of Space Art.

2.1.2

A Theoretical Framework to Describe Uncertainty in the Implementation of the Water Framework Directive

Katja Sigel, Bernd Klauer, Claudia Pahl-Wostl, Helmholtz Centre for Environmental Research, UFZ, Department of Economics, Leipzig, Germany

The Problem: The Water Framework Directive (WFD) is a legislative framework designed to protect and improve the quality of all water resources in the European Union. It was published and entered into force in December 2000. One of the WFD's main goals is to achieve the 'good status' of all European waters by 2015. The implementation of the WFD implies a big challenge for the respective 'competent authorities' due to the number of decisions that must be taken. In general, good knowledge is a precondition for good decisions. However, in many cases the competent authorities do not have a sound knowledge basis for decision making – hence, they have to act and decide under uncertainty. Obviously, this can negatively affect the achievement of the WFD's goals. Uncertainty is also relevant given that the decisions in the implementation of the WFD are public decisions. In order for public decisions to be transparent and open to scrutiny and possible criticism, uncertainty needs to be clearly spelt out and reported during the decision-making process.

Research objective: The overall question underlying this work is how to deal with uncertainty in the implementation process of the WFD. To approach this question it is necessary to have a deep understanding of uncertainty. In the recent environmental literature uncertainty has been treated in a range of different ways and numerous conceptualisations have been put forward (e.g. Brown et al. 2005; Faber et al. 1992; van Asselt 2000; Walker et al. 2003). However, these approaches fail to provide a sufficiently deep insight into the phenomenon of uncertainty affecting the decisions within the WFD. Accordingly, the objective of this work is to develop a theoretical framework to describe uncertainty in the implementation of the WFD in a broad, systematic and differentiated way.

Research approach and results: The theoretical framework of uncertainty is developed on the basis of a broad literature study and two empirical studies about dealing with uncertainty in the implementation of the WFD

(Sigel 2007). The empirical studies (text analysis, expert interviews) were considered essential to establish a close relationship to reality and to illustrate the theoretical framework by means of examples from the WFD.

Within the theoretical framework uncertainty is defined as an actors' state of confidence about his or her knowledge. The confidence may range from being certain to admitting that he/she knows nothing relating to a concrete question. Hence, uncertainty as it is understood here is subjective and it comprises two layers: Knowledge and confidence about knowledge. Based on this general definition of uncertainty the framework developed in this study includes five complementary views on uncertainty: (i) Typology of uncertainty, (ii) sources of uncertainty, (iii) factual and normative uncertainty, (iv) reasons for uncertainty and (v) reducibility of uncertainty. Each view describes one characteristic feature of uncertainty. For example the view 'factual and normative uncertainty' distinguishes between uncertainty that is related to factual knowledge (corresponding to systems knowledge) and uncertainty that is related to normative knowledge (corresponding to target knowledge). Normative uncertainty exists because the European legislator cannot and should not reasonably prescribe every detail of implementation. Hence, the WFD leaves many questions regarding the operationalisation of goals and measures to the 'competent authorities'. Normative uncertainty can be interpreted in a positive sense, as it gives room for freedom of action and for processes of learning and adaptation – this does not hold for factual uncertainty.

The views on uncertainty as part of the theoretical framework are strengthened by further definitions and examples from the WFD. Overall, they facilitate a broad, systematic and differentiated description of uncertainty within the WFD. Concretely, parts of the theoretical framework have already been used to analyse the role of public participation in managing uncertainty in the implementation of the WFD (Newig et al. 2005).

Contribution of the paper to the conference theme of problem framing: The theoretical framework developed here can help to get a deeper understanding of the different facets of uncertainty in the context of decision-making. The decision-oriented approach can be interpreted as a way of problem framing which is able to establish a close link to the selection of appropriate measures and problem-solving. Uncertainty poses a big challenge in decision-making as policy makers often cannot revert to a sound knowledge basis.

2.1.3

An Inventory on a Local Environmental Issue, Having Global Applications in Respect to Biodiversity Conservation

Anil Tewari, Ewing Christian College, Allahabad, India

Any complicated environmental issue needs to be handled with an holistic approach in order to attain the desired goal, otherwise the applied strategy of eco-restoration will only yield partial, unsustainable result, particularly in a country like India. Human Population beyond the carrying capacity of most of the existing ecosystems of the country are in a pathetic state. Vindhayan hill range is one of them, which serve as an important water encatchment zone of the tributaries of holy rivers like Ganges and Yamuna. Despite of all possible efforts, the Eco-erosion is still going on. It gives us an opportunity to have an international monitoring mechanism of on going eco-restoration efforts, which can only be realized through involving the educational institution of the area as main stake holders. Now the time has ripped enough to seek an international intervention even in a sovereign country in their internal affairs related to environmental issues. This again can only be achieved through breeders of the young generation – The educational institutions. How a complex integration of all stake holders could be achieved will be first question, which has to be answered before indulging into such issues.

In the above context the paper deals with the ecological complexities of the deciduous forest ecosystem of Vindhayan hill area adjoining to District Allahabad (U.P.) INDIA and interesting findings on adaptive features of a dominant plant species of the area has been illustrated and how an appropriate herbal technological solution could be evolved to face the challenges of the area has been discussed. The global implications of the proposed efforts have also been discussed in respect to integration of ethics ecology and economy, to achieve the goal of sustainable development in the developing countries. The transdisciplinary solutions, as suggested in the present paper are innovative and effective to deal such complex environmental issues.

Paper session 2.2: Stakeholder Dialogues and Problem Framing of Sustainable Energy Options

room: CHN D 32 | chair: Kirsten Holländer

Joint session

Kirsten Hollaender, Interuniversity Center for Social Science Theory and Methodology ICS, University of Groningen, The Netherlands, and *Eefje Cuppen / Pauline Fransen / Matthijs Hisschemoeller* and *Corinne Cornelisse*, IVM, VU Amsterdam, the Netherlands

Introduction: Sustainable energy options for mitigating climate change are controversially discussed in the Netherlands. Use of biomass and bio-

energy, e.g. feature prominently in these discussions. The transition towards sustainable energy systems is complex and uncertainties concern as well knowledge base as societal judgment and acceptance. We present results from the analysis of stakeholder dialogue projects on the sustainability of biomass, bio-energy and bio-fuels. Stakeholder dialogues are seen as a promising approach to support innovation for solving “wicked problems”. They bring together heterogeneous actors with diverse knowledge backgrounds. Our presentations deal with analysis of problem framing and methods to structure and facilitate the framing of problems using different approaches: Toulmin argumentation model, stakeholder analysis and Q methodology and pilot project for energy neutral buildings. We will conclude with reflections on the relation of problem framing and power issues. The framing of problems has consequences for groups of actors when translated into policy decisions. These actors thus try to influence framing processes so they are in line with their interests. Accordingly, framing is not only guided by epistemic insights but also by personal interests. Groups of actors even might want to prevent certain problem framings from emerging. In the Netherlands we observe a prominent role for regime players in the National task force which leads to developments in problem framing on energy transition putting niche actors and innovations under pressure.

Kirsten Hollaender, “Problem Framing and Stakeholder Positions on the Use of Bio-fuels: Analysis of stakeholder policy positions”

Bio-fuel use is controversial. Results of the analysis of stakeholder positions on different policy options show differences between positions on the use of first and second generation bio-fuels for transport. Surprisingly, quite different groups of stakeholders such as environmental NGO’s and oil companies are seen to chose similar policy positions. However, our analysis shows this is due to different problem framings. These different framings of the use of bio-fuels and how they translate into choosing policy positions and the chances for finding new solutions are analysed. In transdisciplinary problem framing next to epistemological criteria policy preferences become evident.

Eefje Cuppen, “Q Methodology to Articulate Divergent Perspectives in a Participatory Project on Energy Options from Biomass in the Netherlands”

Participatory knowledge production requires the articulation, confrontation and evaluation of divergent perspectives and argumentations. Q methodology is presented here as a social scientific method to facilitate the articulation of divergent perspectives in participatory assessments of complex policy issues. Q Methodology is a method to analyse ‘subjectivity’ and involves a statement-sorting task and a factor analysis. Q methodo-

logy was applied in the Biomass Dialogue: a participatory project that aimed to develop ideas about innovative, sustainable bio-based energy chains for the Netherlands. Analysis of the Q data resulted in six different perspectives on the sustainability of biomass. Q methodology appeared a useful tool to select stakeholders for the Biomass Dialogue, and to structure the dialogue.

Pauline Fransen, "Toulmin Models as Tool for Mapping Dynamics in Stakeholder Dialogues"

The goal of the Costa Due Dialogue is to develop innovative ideas for concrete sustainable energy projects that could be implemented in the Eems region. The Costa Due dialogue was organized around four topics in four heterogeneous groups. It was hypothesised that in groups with a positive dynamic most viable projects would be developed. The dialogues in the groups were mapped in Toulmin models; dynamic is interpreted as a Toulmin model with greater complexity. The presentation will show some exemplary Toulmin models linking their interpretation to group processes.

Matthijs Hisschemoeller and Corinne Cornelisse, "Diamond4Ever: Exploring the possibilities for a climate neutral office building in down town Amsterdam"

This paper focuses on the socio-political conditions that may hamper or foster an acceleration of the energy transition in the Netherlands and abroad. Dominant knowledge coalitions and technological paradigms constitute a major barrier in this respect. At local level, however, policy makers feel an increased urgency to reach results. The former Diamond Exchange in down town Amsterdam is now in use as the office of the municipal environmental policy unit. It is a monumental building. Under contract with Amsterdam municipality, a dialogue approach was used to develop two scenarios for bringing down fossil energy consumption to zero. The projects demonstrates that even the more difficult type of dwellings can become self sufficient with respect to heat, cold and electricity.

Paper session 2.3: Hospitals; consumption; decision support
room: CHN D 44 | chair: Elisabeth Zemp

2.3.1

Sustainable Hospital: A transdisciplinary endeavour

Willi Haas and Ulli Weisz, IFF-Institute for Social Ecology, Klagenfurt University in Vienna, Austria

Sustainable development requires health services and patient treatment systems that are viable for the future, systems whose own functioning must meet the criteria of sustainability. Hospitals play a central role in the

health services system and make both a significant contribution to public health and to environmental impacts. Such twofold significance makes them major players in ensuring a fundamental building block for the sustainable development of society as a whole.

This is where the project “Testing the sustainable hospital” comes into play. In a joint collaboration between scientists from social ecology, from sociology of health and medicine as well as from economics together with practitioners from different levels and professions within a partner hospital we research the possibilities that exist for introducing the concept of sustainable development, an issue which until now has been rather a novel one.

This transdisciplinary endeavour offers some lessons learnt that will be presented in this contribution. The insights will focus on two preconditions such a transdisciplinary project has to meet in order to be successful.

First of all hospitals face pressing problems ranging from employees who themselves risk their health due to the manifold often overdemanding challenges to serious financing problems leading to the permanent threat of cost cutting. Not to talk about the requirement of patient orientation that hardly can be met under such conditions. However, this situation is well known and many forces are about to tackle the overwhelming challenges. One of the key questions is, how to frame the issue of a sustainable hospital that does not just add another stress factor to the already risky state of hospitals. This requires a sound analysis of the pressing problems as sustainability problems and a recognition of initiatives on the way to address those problems. So the remaining but never the less crucial question is what is the value added of a sustainable hospital. In order to deal with this question the transdisciplinary team identified three areas with significant potential for improvement in the pilot hospital with the aim of developing practicable solutions. These “test areas” are: (1) Sustainable corporate management, (2) Sustainable service planning, and (3) Sustainable service provisions. The contribution discusses various added values as seen by the practitioners with some interpretations by the scientists.

However, this raises a second issue. While a sustainable hospital has to proof its usefulness in practice in order to gain momentum, the fundamental idea of sustainable development should not be carried away by the harsh storms of the day-to-day business. So one of the key questions is to define a notion for sustainable hospitals that a) follows the principles as necessary to contribute to the solution of global problems and b) is precise enough to give orientation in the distinction between hospital dynamics that worsen and that improve the hospital’s sustainability. For doing so several thoughts have been developed. A sustainable hospital has to maintain its relationships with the environment in the long run. Problems of the system can’t be shifted to the environment without consequences for the

system itself. Additionally, the sustainable hospital would not be seen as a static final state but rather as an intelligent, learning organisation in which ecological, social, and economic aspects are systematically processed together. The permanent learning exercise needs to focus on knowledge for solutions that establish an overall positive dynamic between these aspects towards enhanced sustainability even as a long-term effect.

Concluding that in this project the transdisciplinary problem framing was developed in a transdisciplinary joint process that aims for interest from both various scientific communities and further hospitals.

The project “Testing the sustainable hospital” (May 2006 - April 2008, funded by the Austrian Technology Ministry.) is a cooperation involving an interdisciplinary team of researchers with an Austrian Health Promoting Hospital, the Viennese Otto Wagner Hospital, the Vienna Hospital Association and the Berlin Immanuel Diakonie Group. In 2007, the three sub-projects were approved as health promoting measures.

2.3.2

Changing Everyday Routines Towards Sustainable Consumption: The challenge of integrating interdisciplinary and life-world knowledge

Martina Schäfer, Melanie Jaeger, Adina Herde, Sebastian Bamberg, sozialwissenschaftliche Nachhaltigkeitsforschung, Zentrum Technik und Gesellschaft der TU Berlin, Germany

The project “Life events as windows of opportunity for change towards sustainable consumption patterns” aims at motivating persons who are passing through important life events (birth of the first child, relocation) towards making changes in the direction of sustainable consumption patterns. The two target groups are being addressed through a theory-based dialogue marketing campaign which is planned in close cooperation with enterprises and civil society organisations. In order to understand the characteristics of habitual consumption patterns and mechanisms for changing them, the project draws on psychological and sociological theories and concepts.

The bases for conceptualising the marketing campaign come from psychology: the extended model of goal-directed behaviour (Bagozzi 2006) and the phase model of behavioural change (Prochaska et al. 1997). These concepts conceptualize behavioural change as a process that consists of several phases with different characteristics. They assume that the process of changing habitual behaviour is not passed through automatically; there is rather always a risk of irritations and interruptions at every stage. According to the extended model of goal-directed behaviour (Bagozzi 2006), whether the phases of behavioural change can be passed through success-

fully depends mainly on social support and surrounding moral norms as well as on the self-efficacy of the individual to deal with difficulties.

The sociologists in the project draw on the concept of life-world (Luckmann 1978, Matthes and Schütz 1993, Schütz and Luckmann 1973), which allows analysis of the ways in which people attempt to integrate different aspects of their lives (e.g. family, job, consumption). It differentiates between “the unquestionably given” and “the problematic”, thus allowing researchers to look closely at changes of daily life routines (“the unquestionably given”) that are initiated by life-events (“the problematic”). There is also a focus on the contextual conditions that influence individual performance, such as social networks, mobility infrastructure and market-supply conditions.

The foregoing theoretical concepts have been drawn on for problem framing and posing research questions from different perspectives concerning the processes of behavioural change and the influence of life-events on them (systems knowledge) as well as for conceptualizing the marketing campaign (transformation knowledge).

Actors from enterprises and civil society organisations, as well as from city-level administration, have been integrated at an early stage of the project. Exchange with these partners was geared towards a) getting feedback concerning the central approach of the project of addressing target groups that are passing through life-events; b) gaining information about their experience with communication measures in the fields of sustainable nutrition, mobility and energy use; and c) motivating them to participate in an “alliance for sustainable consumption” on the local level and to provide informational material as well as additional offers (e.g. vouchers, cooking courses, bike tours) as a part of the campaign. The life-world knowledge of the practical actors is mainly being used to gain transformative knowledge concerning the design of the campaign.

The presentation will show in greater detail how the challenge of integrating interdisciplinary and life-world knowledge is taken up within the project. In order to integrate the different disciplinary approaches and results won by qualitative and quantitative methods the project is drawing on experience with triangulation from existing literature (Flick 2004, Kelle 2001, Fielding & Fielding 1986) and external consultation. Continuous reflection on the process of transdisciplinary cooperation is assured through regular meetings and interviews with the actors concerning their expectations and perceptions about the process. The project also draws on experience derived from various forms of social-ecological research and sustainability research (Bergmann et al. 2005, Boeckmann et al. 2007, Brand 2000, Hirsch Hadorn et al. 2008, Hirsch Hadorn et al. 2006, Klein et al. 2001, Luks and Siebenhüner 2007, Schäfer 2008).

2.3.3

The Use of Inter- and Transdisciplinary Knowledge in Decision Support for the Rehabilitation of Post-Tsunami Nicobar Islands, India

Simron Jit Singh and Willi Haas, Institute for Social Ecology, University of Klagenfurt, Austria

The presentation reports on an ongoing transdisciplinary research project (RECOVER) whereby scientific support is generated for the planning and implementation of development options for the indigenous population of the Nicobar archipelago in the aftermath of the 2004 tsunami. The Asian tsunami has clearly revealed the vulnerability of coastal communities with respect to dealing with ecological hazards. An area that was highly affected by the tsunami was the Nicobar Islands, an archipelago belonging to India located in the Bay of Bengal. Consequently, a third of the indigenous population was wiped out and those that survived were rendered homeless and without an economy to support them. Consequently, inappropriate aid interventions in the aftermath added another dimension to the problem of social, cultural and ecological sustainability. Based on years of research and engagement with these islands, the social-ecological research team developed a systems dynamic model taking demographic developments, technology, ecological limits, aid, time use and food supply into account. The presentation will focus on describing how transdisciplinary approaches were used in providing decision support by using knowledge gained from the model during the rehabilitation process.

The paper contributes to the theme of 'cultural change' and provides insights on how different forms of knowledge are used in framing and addressing the problem at hand. The core of the study is in guiding intervention and social processes based on sound systems knowledge arising from a decade of socio-ecological research in the region. Decision support is provided via the use of the systems dynamic model in order to develop jointly with key players from the islands scenarios that are culturally appropriate, socially equitable, economically feasible and ecologically sound.

Paper session 2.4: Tracking the Human; local knowledge;
plurilingualism
room: CHN D 46 | chair: Martin Boyer

2.4.1

Tracking the Human: Problem framing in a transdisciplinary research project

Martin Boyer, Rainer Egloff, Gerd Folkers, Priska Gisler, Beatrix Rubin, Collegium Helveticum, University of Zurich & ETH Zurich, Switzerland

The presentation will portray a particular transdisciplinary research project (at Collegium Helveticum, Zurich) and discuss its approach with regard to problem framing.

The referred group of researchers comprises diverse disciplinary backgrounds including pharmaceutical chemistry, neuroscience, sociology and history. While drawing on these heterogeneous disciplinary qualifications – represented especially in four related sub-projects –, the group aims at transdisciplinary problem framing with regard to its overarching research interest. This interest, put simply, lies in the role of particular figurations of „the Human“ to be found at the basis of any research within the human sciences. It is hypothesised that these particular paradigmatic figurations of the human are embodied in and guide research practices, methods and theories. They thus enable, limit and prevent gains of knowledge.

This proposed presentation focuses on the difficulties and practices of common problem framing within the portrayed transdisciplinary research group. The following issues, articulated as theses, will be discussed:

- transdisciplinarity as an epistemic culture or a thought style,
- problems and possibilities of a common publication strategy,
- relevance and variances of stakeholder definition within trans-disciplinary research,
- effects of (differing) expectations,
- effects on disciplinary standing and insights.

2.4.2

Last Things First in Development Research

Thomas Bearth, Department of General Linguistics, University of Zurich, Switzerland

The current debate on development assistance brings to light deep ambiguities and insecurities in affluent society and the way it defines its role in a world increasingly perturbed by inequalities in terms of access to resources and opportunities, and an ensuing potential of destabilization cutting across ideological, cultural and racial distinctions. In claiming public attention, calls for a moratorium compete with pleas for a supreme effort aimed at putting an end to poverty (Sachs 2005), appeals for liberalization of the markets with those advocating the contrary. In this ongoing debate, the dominance of differences of economic and political doctrine and of conflicting economic interests hides the deeper issue at stake: the uncertainty as to how to frame the problem to which development and assistance towards it ought to be the answer, a shift of perspective argued for poignantly by former world bank economist W. Easterly (2006). Behind the controversy about appropriate strategies lurks uncertainty about the criteria for defining the goals to which these strategies should be applied, to whom and by whom (target knowledge). How else than as a reference to an alarming gap both in relevant knowledge and transdisciplinary closure should the World Bank's warning be understood that failure or suc-

cess of strategies for achieving Millenium Development Goals will hinge on the space given to the poor themselves for making their voice heard and heeded (WDR 2004), a plea repeated four with pathetic insistence by top exponents of the world's leading development institutions in debating the current food price dilemma (BBC World Debate: Food – Who pays the price? IFAD, Rome, 28th March 2008)? The persistence of this call for help from those most in need of it, surprising as it is after four decades of uncontested reign of participatory models and adherence to the “paradigm of the local”, suggests, along the line of Martens et al. (2002), a missing communicative link (“broken feedback loop”) as one of the main causes of what many see as large-scale failure of international development.

Addressing the problematic from a less donor-centered perspective, research carried out in four countries of Africa and Asia, sponsored by Volkswagen Foundation under the title of “Language, Gender and Sustainability” (LAGSUS, 2003-2007; www.lagsus.de), has led to its reframing in terms of decreasing vs. increasing control by local populations over communicative meta-resources necessary for in turn achieving control over local resource management. In this approach, the notional pair of Communicative Dependency (CD) figures as the problem vs. Communicative Sustainability (CS) as the target of development processes integrating communicative empowerment (knowledge plus power of negotiation) and material progress as twin prerequisites to overcoming poverty. Corresponding reframing of research methodology (i) stipulates epistemic priority of local analysis (LA) over aprioristic scientific diagnosis, e.g. in determining locally relevant descriptors of poverty (target), procedures of accountancy (procedural), or gendered local views on development (systemic), (ii) reinterprets LA output as input of a second cycle of collaborative research involving local constituencies, relying on local language as the medium of exploration.

The institutional vacuum engendered by the Ivorian war provides the originally unanticipated experimental frame for developing and testing these principles of collaborative research and observing its catalytic effects in controlled environments, among which the transformation of prevailing victim mentality into a renewal of actor perspective is remarkable, accrediting en passant convertibility of intangibles into tangible values of local development. Transdisciplinary closure as an urgent priority at the present junction of North-South confrontation presupposes a multi-focal epistemology credibly integrating remote actors into strategic thinking on current issues.

2.4.3

Plurilingualism as a Transdisciplinary Project: Some considerations on transcultural didactics of foreign languages

Annikki Koskensalo, Institute of Teacher Education, University of Turku, Finland

The concept of Multiculturalism in Europe fails if it is not paralleled with an inclusive attitude and by integrative practices. The inclusionary approach is the theoretical as well as methodological way to move and dialogue between European cultures, languages and disciplines. European language policies have to follow the principle “Plurality in unity (and equality)”. In contrast to Multiculturalism, the concept of Transculturality (Welsch 1999) is guided by the acknowledgement of differences as well as by the principle of the equality of the communication participants. The paradigm of Transdifference (Breunig/Lösch) and the notion of hybridity as an attribute of all human beings, whose considerable heuristic value has become apparent over and over again, has to be connected with Transculturality. The transformation of this theoretical construction into a methodological form seems to be a case of Problem Framing. The Principles for Designing Transdisciplinary Research (Pohl/Hirsch Hadorn 2007) can provide help in a very similar way like Plurilingualism as a transversal project to solve this problem. Practically there has to be reached a realistic synthesis between the principles of traditional Didactics of Foreign Languages (Bausch/Christ/Krumm 2003), European Language Portfolio and Common European Framework of Reference of Languages. The importance of Didactics of Foreign Languages will be growing in relation to the increasing segments of transcultural people in European societies and the concomitant necessity for transcultural competence. The aim of such competence is to foster cooperation and conviviality on the basis of (self-)reflexive knowledge about one’s own culture in order to better understand other cultures and human beings. The emergence of a transcultural identity will be grounded in transcultural sub-competences such as openness, empathy, tolerance of ambiguity, ability of dialogue, sensibility for community and equality, and the ability to develop a position of one’s own with clear borders in order to resist a facile or wrongly interpreted relativism.

Workshop session 3: room: STW 1

Problem Framing as a Bridge between Transdisciplinary Teaching and Research: Algae for bioenergy generation (case study)

Richard Beecroft and Marc Dusseldorp, Institut für Technikfolgenabschätzung und Systemanalyse (ITAS), Forschungszentrum Karlsruhe, Germany

Based on our experiences with three seminars “Planspiel TA” (technology assessment simulation), the workshop will focus on problem framing as a possible link between teaching and research in transdisciplinary sciences.

Planspiel TA: In each of these seminars, offered since the winter semester 2006 at Darmstadt University of Technology and Karlsruhe Institute of Technology, the students carried out a fictive technology assessment (TA) project following the procedures of the “Office of Technology Assessment at the German Parliament” (Büro für Technikfolgenabschätzung beim Deutschen Bundestag). They started with a vague question in the field of future energy supply (hydrogen technologies, nuclear fusion, geothermal energy), with the aim of producing a (fictive) TA report as scientific policy advice. In doing so, they had to change the frame of the initial problem several times to derive results which fulfil the criteria for a good TA report. They had to focus on:

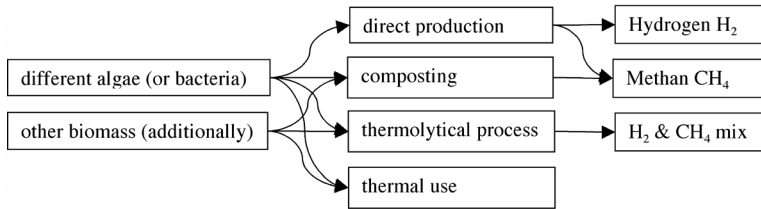
- the *relevance* of the issue,
- the *feasibility* of the production of the report,
- the *credibility* of scientific knowledge in this field,
- the *coherence* of the different arguments they included and
- the *usefulness* of the report in political contexts.

This iterative problem framing in the seminar provides the students with the opportunity to analyse the role of TA between science, politics and society by reflecting upon their own experience.

The Workshop: To provide a vivid impression of this simulation, the workshop will include one central element of the simulation game to be carried out by the participants: the initial formulation of the question to be tackled. Although this is just one step within the iterative problem framing process in the seminar, it gives a good impression of the possible interrelations of transdisciplinary teaching and research. Before ‘simulating the simulation’, the idea of Planspiel TA, the typical procedures of a TAB project, and the example for the workshop will be briefly introduced. Afterwards, there will be enough time to reflect on the simulated problem framing as an element of transdisciplinary teaching and research.

The example to be tackled in the workshop, algae for energy production, offers different relevant aspects and technical alternatives. As with many energy technologies, these can in principle also be very easily un-

derstood by laypersons, for example using the following diagram:



Contribution to the Conference: Using the Bridge in both Directions

Whilst problem framing is an essential part of transdisciplinary research, it is widely neglected in teaching: The frame of a course is usually set, students rarely get a chance to frame problems themselves, despite this being an essential requirement for transdisciplinary research. Our experience with Planspiel TA shows that problem framing can be used as a central didactical element not only to learn something about a particular technology and about problem framing, but also to fulfil other objectives:

- to provide opportunities for active studying
- to make use of the participants' competencies
- to learn about other scientific approaches

With each change of the problem frame, different issues came up not only on the object of the study, but also on the role of science and humanities in societal contexts. Reflection proved to be a crucial part of problem framing. For this workshop, the seminar concept will be used to study one possible way of problem framing. The workshop can profit from this format developed as a seminar, since both can be seen as methodological reflection on transdisciplinary research.

Paper session 3.1: Land use; risk; gender

room: STW 2 | chair: Manuela Rossini

3.1.1

PreussenRiskware: A transdisciplinary concept for the assessment of environmental and social risks

Matthias Finkbeiner, Sebastian Schulz, Robert Ackermann, Institute for Environmental Engineering, Technische Universität Berlin, Germany

The ecological risk assessment is a prime example for inter- and transdisciplinary problem framing, because a large variety of different data models have to be collected and combined in order to create an overall model, showing social and environmental impacts of a technical risk.

In all conventional or non-conventional operating conditions of a plant, emissions with social, ecological and therefore economical impacts are

released to the environment. In order to assess the ecological risk of the plant itself, the handling and transport of chemicals, many specialists of different disciplines have to calculate different partial models (i.e. the technical risk of an accident, the amount of non-conventional emissions, the fate of pollutants in water, soil and air, the emission concentrations of pollutants humans could be exposed to, the health impact of the exposure and the socioeconomic and environmental damage, etc.).

PreussenRiskware is a common decision support method to identify environmental, economic and perceptual impacts from technical processes. In PreussenRiskware all those models should be gathered and put together in order to assess the social and ecological risk in an interdisciplinary overall model. This enables software users to combine a lot of different models, which they couldn't assess on their own, to accomplish the goal of interdisciplinary and holistic assessment.

In order to simplify and accelerate the calculation, existing contemporary partial models should be made available in a compatible way. Using a risk-assessment-software impact assessment could be used for land use planning, facility planning, emergency plans or acute risk management. A contemporary reaction of the facility operator and a sharing of information about the expected damages with a fire department after an accident can only be achieved, if all needed information are available and combinable on demand.

The main focus of the paper is the presentation of the overall concept, the databases, existing models and spatial data resources. In addition, the necessity of interdisciplinary cooperation of research institutes should be discussed since a lot of existing models and information are already available, but not compatible in such a way that they could be connected.

3.1.2

Integrating Gender into Transdisciplinary Land-use Research via Participative Modelling

Barbara Smetschka, Veronika Gaube, Juliana Lutz, Institute for Social Ecology, Vienna, Austria

Sustainable development in rural region in Austria under conditions of EU's Common Agricultural Policy is the focus of various socio-ecological research projects. The ongoing structural change in European agriculture with its implications for ecology (landuse, material and substance flows) and society (regional development, food and crops, cultural landscapes) is one of the long-term socio-ecological changes well documented.

It is an interdisciplinary task to ask how data and results from different sources (statistics, remote sensing, surveys, interviews, land registers) made available by different disciplines can be consistently combined. And it is

a transdisciplinary approach to ask how models and scenarios can be used to promote social learning and empower stakeholders by generating insight into the history and future of complex and uncertain socio-ecological systems. The transdisciplinary research process has two aims. First to enhance knowledge on the system and possibilities for sustainable development and second to build a model that can be used by scientists and stakeholders to develop scenarios and strategies.

Both questions lead us to make an attempt at participative modelling. Building an agent-based model is a way to use this scientific knowledge and the expertise of agricultural experts and farmers for developing future scenarios and regional strategies for sustainable development. That means we tried to use the method of participative modelling to frame the problem and the process of our research. This demands to translate various different forms of system knowledge into a formalized model, to develop targets and target knowledge commonly in a participatory process with scientists, experts and farmers and to develop strategies and measures together to enhance the possibilities of implementation and transformation knowledge.

How to integrate gender issues was the third question posed by scientists and stakeholders. We attempted at realizing this in two ways: Time-use data are used to integrate a gender perspective in the decision tree. This set of optional decisions were developed in a participatory process with agricultural experts and farm women of the region.

This paper presents an agent-based model where single farm households are the agents within the ecological and socio-economical setting of an Austrian region. The model assesses effects on patterns of land use as well as socio-economic conditions induced by changes in the farms' environment, such as changes in subsidies on the European and national level, changes in agricultural policy, and changes in market prices of agricultural products. The decision-making process of each agent is simulated within a "sustainability triangle" of ecological, economical and social dimensions.

Three scenarios are analysed: A trend scenario, a globalisation scenario and a sustainability scenario. The urgent problems of decreasing farm activities and increasing forests could be stopped at a certain level with the measures assessed in the sustainability scenario. However, this would increase the workload on the women farmers and has therefore to be taken into account to enhance the success of any effort towards sustainable development.

3.2.1

Problem Framing in Interdisciplinary Teams – (How) Can it be Done?

Rico Defila, Antonietta Di Giulio, Interfakultäre Koordinationsstelle für Allgemeine Ökologie (IKAÖ), Universität Bern, Switzerland

To be successful, in inter- and transdisciplinary research the participants (from different disciplines as well as those of actors from the private sector, civil society or public agencies) have to arrive at a joint understanding of the problem, at common objectives, at shared questions and at a common approach for dealing with them, meaning that the various disciplinary and life-world perspectives have to be made explicit and have to be interrelated. In the contribution this statement will be supported by empirical data from the international DACH-survey as well as by case studies conducted by different research teams during the past years.

The challenge of problem framing lies in the diversity of perspectives: It is well known that the members of an interdisciplinary team need a strong disciplinary identity. Otherwise they aren't able to identify and to communicate what exactly the contribution of their own approach to a specific interdisciplinary project consists of, in short they can't participate in the interdisciplinary problem framing. At the same time, a strong disciplinary identity is the main cause of specific problems in interdisciplinary teams. Scientists must be able to overcome their disciplinary perspectives, to relate their disciplinary way of structuring the world to that of others. Scientific disciplines are traditionally defined and distinguished from each other by elements such as (often pre-scientific) objects of investigation, theories, scientific community, criteria of scientific quality, or methodology (as they are defined in particular by the philosophy of science, the history of science or the sociology of science). Correspondingly these elements are used to identify and describe disciplinary contributions to interdisciplinary questions. In the contribution it will be discussed which of these elements are crucial in the process of problem framing and which of them could help understanding the differences between different actors from the private sector, civil society or public agencies in transdisciplinary teams as well.

This will be the starting point to elaborate the different sub-tasks problem framing in an inter- and transdisciplinary team comprises in detail (such as developing a common language and developing theories that integrate the various disciplinary viewpoints in such a way that the result, for example the description of the research object, is shared by all) and to discuss by what means these processes could be supported. Furthermore it will be discussed, to what extent a joint problem framing can be done.

3.2.2

Cultuur Lokaal: Transformations in the cultural sector

Anne Nigten, The Patchingzone, V2, Rotterdam, *Kristina Anderson*, STEIM, Amsterdam, The Netherlands

This paper deals with the Cultuur Lokaal project that aims to inspire the personnel of the cultural institutes to explore new ways to engage with the people in the street and local (informal) networks. In this project we dealt with contemporary issues that are connected with the repositioning of cultural institutes in the digital age. The investigation deals with the transformation between professionals in the institutes and their audience as well as the role of the institutes in society. The project was developed according to a user-centred or participatory design approach. The project's thematic focus dealt with new media formats, local identity and audience participation. The key areas have a strong emphasis on the interaction between technology and the user or participant. In the Cultuur Lokaal team several shared fields of interest amongst computer scientists, social scientists, design and electronic artists were identified. These themes are common ground for shared experiments and knowledge building in the space between the involved disciplines. We continue with an outline and motivation for our methodology that is deployed in our new praxis-laboratory model that is currently in its start-up phase: the Patchingzone. The Patchingzone is a transdisciplinary praxis laboratory where Master, doctor, post-doc students and professionals from different backgrounds create together meaningful experiences. We make a case for the transdisciplinary collaboration model being the most suitable collaboration model for complex issues such as this cultural transformative situation. Furthermore we bring forward the 'Processpatching' approach, as it is defined in the Anne Nigten's PhD thesis, as the main methodology for creative research and development.

3.2.3

Reliable Participatory Research: Learning from the social sciences

Paul Burger, Program Sustainability Research, University of Basel, Switzerland

Proponents of transdisciplinary research often claim that stakeholder participation within problem oriented research promise to yield to better societal solutions to the issue in question than traditional disciplinary or even interdisciplinary research. However, it is far from being evident that the promise can really be kept. Firstly, the results of a research project on transdisciplinary research (Zierhofer & Burger 2007) draw our attention to the fact that a majority of such projects does not investigate into objectives, but takes them as given, and that the normative background assumptions

very often remain unreflected. Secondly, research on participatory tools and instruments within the political domain makes us aware of shortcomings and weaknesses among this type of democratic processes, i.e. participation itself is a challenging endeavour within our strongly differentiated society. Thirdly, methodology of social sciences teaches us a lot about the potential of biases within especially qualitative research designs (especially interviews). Against the background of these three problem fields the question to be answered is what methodological quality assurance measures lead to reliable participatory research in order to keep the promise.

My presentation aims to contribute to such an answer by presenting what I take to be two prerequisites for a reliable problem oriented research project. Firstly, I present a conceptual scheme for problem structuring based on a traditional understanding of human actions. As problem oriented research intends to change human activities, the conceptual elements of what makes an activity to be an action can systematically steer our problem analysis. Moreover, the scheme does not only allow to identify knowledge gaps but also to assign them to scientific disciplines (natural and social sciences). Secondly, I argue that a reliable participatory process must rely on an actor analysis, which takes their powers, interests, and potentials etc. together with their institutional frame-conditions into account. Problem structuring against the background of the presented scheme together with such an actor analysis will provide basic information on the actors' action space and can be used for a variety of different subjects fields. Finally, I will point out in what respect these two analytic tools are able to meet the challenges mentioned above, hence to avoid biases.

Paper session 3.3: Systems; complexity; body
room: HG D 5.1 | chair: Sally Jane Norman

3.3.1

System Identity and Direction: A look at framing as an inside job

Katharine N. Farrell, Department of Policy Analysis, The National Environmental Research Institute of Denmark (NERI)

The aim of this paper is to explore the relationship between system identity and the kinds of deterioration of systems that are associated with poor management of system identity structures. The analysis can be related to health systems and security systems but it also relates to and will be primarily presented with respect to the ecological economic of ecosystem services and the human task of 'living with living systems'. The basic argument is that framing is an inside job and that identity is the most basic frame determining the predictable (and unpredictable) behaviour of a system, including its durability and direction. It is proposed that attention,

within any living system, to the formal and regular management of a coherent identity for that system is crucial not only for choosing direction but also for avoiding deterioration. With respect to the ecological economic of ecosystem services two instances of framing: (1) the pollution permit trading system associated with the International Framework Convention on Climate Change; and (2) the concept of biosphere reserves and conservation areas. The associated systems boundaries for analysis, the identities of these systems and some consequences will be discussed. The implication of presuming that identity maintenance is crucial to system stability are twofold: (1) identity maintenance can take priority over direction – giving rise to coherent but destructive systems [call this destructive resilience (ala Holling et al)] and (2) clear purposive directional orientation [call this development (ala Norgaard)] is not possible without dedication of resources internal to the system, to caring for the maintenance of identity. The paper will talk about the bridging work that framing does, linking the internal work of managing a system with its external role within the large regional or earth systems to within which it is embedded, pointing out the procedural link between these two fundamentally different tasks and will explore some potential problems that may arise from conflicts between the two task.

3.3.2

Complexity Sciences and Problem Framing in Transdisciplinary Research

Marcelo Chacón Reyes, Cathedra of Complexity, University of Camaguey, Cuba

Transdisciplinary research has its starting point in a socially relevant problem field. Such real-world problems are the expression of situations where social complexity should reach a new state of self-organization in order to promote human social development as the common good.

The conceptual framework of the Brussels School of Complex Systems offers a systematic approach to understand the complex behavior of systems, as an expression of being dissipative systems in states far from equilibrium. Self-organized behavior is one of the most important types of complex behavior, characterised by ‘far from equilibrium’, constraints (free type, and context sensitive of 1st and 2nd types) and nonlinearity.

In my presentation, I will suggest that Understanding the degree of self-organization of a given social system is a very promising way to identify and structure problems, to analyze them and to implement the results in transdisciplinary research. Moreover, the analysis of self-organization helps to identify the need for the different types of knowledge (systems, target and transformational) and also the social actors involved: A problem is better understood and solved when the perspectives used to iden-

tify and structure it reflect the kind of movement that is present in the system where the problem is located. As a case study, the paper will describe a real-world situation which was created in a company, where the quality of its services was seriously affected due to a complex situation. As a consequence, a socially relevant problem was created. Experiences in a consultancy to this organization are given.

In conclusion, the relationship between Complexity Sciences and Transdisciplinarity is discussed more broadly, and it is argued that complexity can theoretically enrich the recent results in transdisciplinary research.

3.3.3

The Body and Complexity

Sylvia Nagl, Cancer Institute, University College London, UK

The human body is a hugely complex system whose holistic unity is constituted by the dynamic intertwining of a multiplicity of processes reaching across widely disparate spatial and temporal scales. Beyond the boundary of the skin, the body's embeddedness in complex social, physical and ecological environments adds additional layers of complexity. Problem framing in fundamental biomedical research and translation of research to new therapies and health management strategies therefore requires concepts, methodologies and tools which are able to study richly textured process structures of the body, and of the body within social and environmental systems, across scales of space and time.

The paper will present novel integrative approaches to problem framing in the health arena where multiple perspectives on the human body from science, culture and society need to be interrelated in a shared process. The format will consist of three short thematic presentations:

Theme 1: New agent-based methods for computer simulation which offer solutions to these pressing challenges will be presented. These will be contextualised by critical discussion of the general potential of agent-based modelling for inter/trans-disciplinary biomedical research, as well as its epistemic limits. Key concepts of complexity theory (e.g. emergence) and how these are applied to inform our practice will be discussed. Example applications will be drawn from translational cancer systems modelling, genomic medicine, and the European Virtual Physiological Human Project.

Theme 2: These methods are complemented by our research on concept ontologies, vocabularies, and shared data elements which may function as 'boundary objects' in the construction of self-organising and evolving inter/trans-disciplinary webs of knowledge and the integration of multiple

communities of practice. Boundary objects are situated at the border regions between disciplines and are a means of translation by being shared by several communities of practice. They are weakly structured in common use but become strongly structured in specific site use. Thereby, boundary objects are flexible enough to be adapted to local needs and constraints of different communities, but robust enough to maintain a common identity across different contexts.

Theme 3: The crossing of boundaries and integration of multiple perspectives can also be very fruitfully approached through the rapidly expanding field of ‘art-science’. This novel zone of human creativity provides unique opportunities for exploring possible answers to increasingly complex problems, giving voice to a wide range of viewpoints, and making vital contributions to cultural and ethical debates on scientific and technological change. The digitisation of the body and the human person through information technologies and simulation, and a parallel paradigm shift to complexity, constitute primary areas of current debate which are finding expression in artistic practice and art-science collaborations. Recent explorations of art, aesthetic systems and embodied knowledge in dialogue with complexity science will be presented. This shared journey into the body’s complexity, simulated systems, boundary crossings and holistic integration of scales is opening up new cognitive windows for collective efforts in search of new textures of knowledge and emergent possibilities.

Paper session 3.4: Methodology; translational research
room: HG D 5.1 | chair: Gerd Folkers

3.4.1

Problem Framing in Transdisciplinary Projects: Lessons learned from transdisciplinary case studies at the ETH Zurich

Michael Stauffacher, Daniel Lang, Pius Krüttli and Roland W. Scholz, Institute for Environmental Decisions – Natural and Social Science Interface, ETH Zurich, Switzerland

Our considerations on problem framing presented in this paper depart from the Transdisciplinary Case Study (TdCS) design we have developed at the ETH Zurich since 1993. The term transdisciplinary refers in our understanding to a form of knowledge production that supplements traditional disciplinary and interdisciplinary scientific activities by integrating stakeholders from outside academia. Case studies are necessary as phenomena investigated in sustainable development and cannot be separated from their context. Cases are unique, but might always be related to something ‘general’. We deal with problems that share a number of charac-

teristics: high scientific uncertainties, the need to include knowledge from diverse stakeholders and the public and the necessity to gauge diverging goals and interests among different stakeholder groups and scrutinize possible trade-offs. Given these characteristics, it seems evident that these problems are more than ‘ill-defined’ or ‘wicked’: they are also ‘hard-to-be-defined problems’. Different ways of knowing, perceptions, interests and beliefs collide with respect to the questions “what the actual problem is” and “if there is a problem at all”. Yet it is essential to deliberately and collaboratively frame the problem to be tackled from different perspectives at the beginning of a project. Missing or incomplete problem framing can be a crucial impediment for creating valuable results both for sciences and participants from outside academia.

Focussing on this problem framing phase, we discuss and reflect how we have organized the first steps in our projects and what experiences we gained from more than 15 large-scale transdisciplinary projects in a variety of fields (e.g. transportation, urban and rural development, nuclear waste management). Doing so, we can roughly distinguish between projects, where the initiative came from the ‘case’ (e.g. a region), and where we had the initial idea and addressed cases we found promising. Yet, some general patterns contributing to or impeding successful problem framing become visible across most of our TdCS. One crucial aspect within all of these patterns is the role distinctions during this phase. There are steps that can and should be conducted in a collaborative way. There is, however, also the need for reflective steps in which both science and people from outside academia clarify, specify and follow their own specific goals and questions. Based on these insights, we propose a general framework for structuring the problem framing phase. This framework consists of clearly defined steps to be conducted separately by people from outside academia and scientists or in a collaborative setting. On content level, we outline how these steps have been realized in a multi-method approach integrating knowledge from the ‘case’ (e.g. in-depth interviews with key persons), scientific reviews (e.g. assessing which disciplines are helpful to tackle the problem) and joint discussions (e.g. intense collaborative workshops to define the guiding question).

We conclude that only paying enough attention to the initial phase of a ‘common construction of reality’ by jointly framing the problem and thereby achieving a mutual understanding makes it possible for all participants to gain problem ownership. This phase also serves for mutual trust building among the participants involved. In our opinion a transdisciplinary project should depart from a ‘real’ partnership among science and people from outside academia, where all partners join on equal footing with their own interests and goals. Both sides cede part of their au-

tonomy, but must at the same time allow freedom and fulfilment of the other's primary societal function. This implies that a continuous process of mutual differentiation is required as part of a joint problem framing process, i.e. both process level ('who does what?', 'who is responsible for what?') as well as the content level ('what are the issues we tackle?', 'what is the problem?') are essential and need serious attention.

3.4.2

Allergy Vaccines: From the bench to the clinics

Reto Cramer, Swiss Institute of Allergy and Asthma Research (SIAF), Davos, Switzerland

The paper will focus on translational research in the domain of vaccines for allergies carried out at the Swiss Institute of Allergy and Asthma Research in Davos, Switzerland.

Allergic diseases are mediated by inappropriate responses against normally innocuous environmental allergens and include classical allergy (hay fever), allergic asthma, and atopic dermatitis. The incidence of allergic diseases is gradually increasing and at present around 30 % of the population in industrialized countries is suffering from allergy which has progressed to a highly relevant socio-economic problem strongly affecting both, quality of life of affected individuals, and health care burden. Although it is clear that allergy is a disease related to dysfunctions of the immune system leading to the production of allergen-specific IgE immunoglobulins, and in spite of the fact that the biochemical cascade of events ending in allergic symptoms is quite well understood, we still do not know why some individuals become allergic and some do not. Genetic background, environmental factors, social behaviour, and stress might all contribute to establish allergic responses. Irrespectively of the lack of knowledge about the biological function of IgE, potent drugs inhibiting the last steps of the cascade leading to allergic symptoms have been developed. Pharmacological treatments are, however, not able to cure the disease. Empirical work going back to the beginning of the last century showed that immunization is an efficient way to cure allergy. Despite the big advantage of a curative therapy over a symptomatic treatment, only few patients chose immunotherapy, mainly because of a treatment time spanning several years, and of the frequent therapy-related side effects. Therefore, the most efficient way to increase patient's compliance would be to drastically reduce the treatment time in parallel with a reduction of the therapy-related side effects. Because immune responses depend on the route of entry of the antigen, on the amount of antigen reaching the lymph nodes, and on the pathway and efficacy of allergen presentation, a combi-

nation of physiological, immunologic, and genetic engineering knowledge is required to develop new therapeutic approaches.

Strong protective IgG immune responses can be induced in a short time using high antigen doses. Unfortunately, this approach is not applicable to allergens because high doses would induce anaphylaxis. Possible ways to increase doses would be to inject the allergen directly into lymph nodes where effector cells are absent or, indirectly, to increase the efficacy of antigen presentation by direct targeting of the MHC class-II presentation pathway. We have successfully tested the intranodal application route in both, mouse models of allergy and in a clinical study. We could show that this route of application induces strong protective immune responses basically without side effects. To further increase the efficacy of SIT we have engineered modular antigen translocating (MAT) vaccines to target directly the MHC class-II presentation pathway. Ex vivo experiments showed that MAT-constructs are able to stimulate T cell proliferation at very low concentrations in concomitance to the conversion of the allergy-inducing Th2 cytokine pattern to a protective Th1/Treg profile. These results were confirmed in a mouse model of allergy showing that MAT-vaccines are promising candidates for a fast and efficient cure of allergic conditions. Potentially we have solved the complex problem combining a new application route with a targeted vaccine delivery. The real problem is now to translate the experimental work into the clinic. The costs related to clinical trials are relevant and surpass by far the financial resources of research institutions. Therefore, we decided to spin-off the patented knowledge into a venture capital founded company. After a period of intensive work to raise the capital and to fulfil the regulatory requirements, SwissMedic gave us the permission to conduct a Phase I/II clinical study with a first MAT-vaccine which will start at the beginning of July 2008.

Thank you and stay tuned!

We would like to thank all of you for contributing in one way or another to making this conference an interesting and lively event.

The annual Transdisciplinarity Conference is one of the central means of the td-net to promote excellence in transdisciplinary research and teaching. Its main aim is to provide a platform for the exchange between individuals and teams involved in transdisciplinary projects on a diversity of issues (public health, migration, new technologies, climate change, globalisation, etc.) so that they can learn from each other's experiences and further develop integrative methods and approaches for knowledge-based solutions to pressing problems in the life-world.

Since such a platform for regular encounters between transdisciplinary researchers is still lacking in Switzerland and elsewhere, the td-net plans to organise this international conference every year from 2008 onwards. For the next four years, the financing of the conference is guaranteed thanks to the generous support of the Stiftung Mercator Schweiz.

Extending over two days, the event will be organised in collaboration with a different Swiss university or research institute each year. The overall theme will be determined by the Scientific Board of the td-net who also elect the Steering Committee. As the conference should not only serve to further develop and strengthen transdisciplinarity in Switzerland but should also act as a crystallization point for transdisciplinary projects in Europe and beyond, the conference language will be English.

Every other year, the conference will include the ceremony of the biannual swiss-academies award for transdisciplinary research (td-award) in recognition of excellent transdisciplinary research. The td-award is also donated by Stiftung Mercator Schweiz.

This is thus the first of a series of four td-conferences. Please join us again in 2009 so that we can learn from each other's approaches and projects, and build up and intensify the network of transdisciplinary researchers in Switzerland, Europe and beyond.

You can keep informed about the td-net and activities, publications, job offers and much more in the field of transdisciplinary research by subscribing online to our newsletter, see:

www.transdisciplinarity.ch

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