



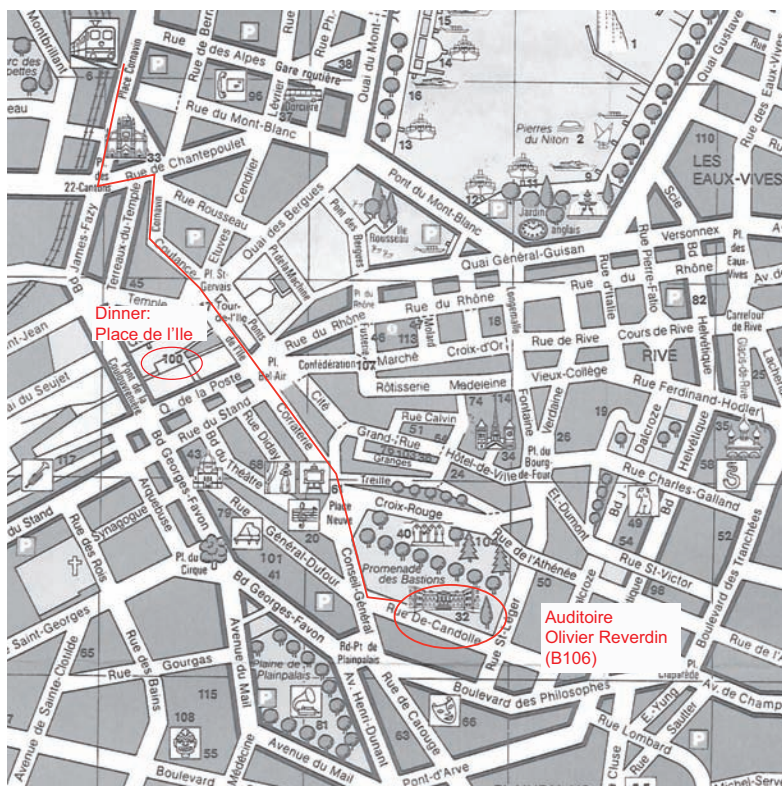
Akademien der Wissenschaften Schweiz
Académies suisses des sciences
Accademie svizzere delle scienze
Academias svístras da las ciencias
Swiss Academies of Arts and Sciences

td-net
Network for Transdisciplinary Research

td-conference 2010

**Implementation in Inter- and Transdisciplinary Research,
Practice and Teaching
Geneva, 15-17 September 2010, Uni Bastions**





**Location: all the events will take place at the Uni Bastions,
Place de l'Université 3, 1205 Genève**

From the Cornavin train station take bus 5 until Place-Neuve or trams 13 and 14 from the main station and, from anywhere in the city, tram 12. Get off at Plaine de Plainpalais.

For the Conference Dinner we will meet at:
«La Brasserie des Halles de l'Île», 1, Place de l'Île
<http://www.brasseriadeshalledelile.ch/lieu.htm>.

Implementation in Inter- and Transdisciplinary Research, Practice and Teaching

Welcome at the Institute of Environmental Sciences of the University of Geneva

Theme

This is the third of a series of annual conferences dedicated to practices, methodologies and epistemologies of inter- and transdisciplinary research and teaching. The first conference focussed on the theme of *Problem Framing* as a decisive and determining initial phase of the research process (see td-conference 2008). At the second conference we addressed issues of *Integration* that cut across the whole research process (see td-conference 2009), from problem framing and problem analysis to the implementation of research results in the life-world. This latter and recurring phase of the research process is the topic of this year's conference.

In a knowledge society, research questions, processes and results cannot be disconnected from everyday practices. Society, politicians and funding bodies demand of researchers to propose efficient ways of how to use abstract findings in concrete situations and as a common good. From the very start, implementation strategies should therefore include processes of embedding the research in its social and scientific contexts, recursiveness and negotiation with non-academic actors, and testing the expected impact through 'real-world' experiments. How exactly to bring research results to fruition, integrate theory and practice and build truly participative collaborations are key issues of inter- and transdisciplinarity.

The major aims of the td-conference 2010 are therefore:

- to present and critically discuss theoretical, conceptual and methodological models and 'tool kits' for implementation strategies;
- to learn about practical experiences with implementation in different scientific and social contexts as well as in various professional fields;
- to highlight achievements and challenges for effective implementation not only in research but also in education;
- to collectively forge theories, concepts and methods for integrating theory and practice and thus
- to create synergies between researchers and practitioners of various professions, NGOs and grass-root movements.

Programme

Wednesday, September 15, Auditoire Olivier Reverdin (B106), Uni Bastions

12:00 – 14:00 Registration

14:15 – 14:45 **Welcome by the partner institute**
Roderick Lawrence, td-net board, U of Geneva

Welcome by the University of Geneva
Yves Flueckiger, Vice-Rector for International Affairs

14:45 – 15:15 **Introduction**
Christian Pohl, Co-Director td-net

15:15 – 16:00 **Goals, Functions and Products of Transdisciplinarity**
Opening Keynote:
Roland W. Scholz, ETH Zurich

16:00 – 16:30 Coffee break

16:30 – 18:30 Parallel Sessions I: Workshops 1-3 and Posters
B105 W1: **Action Research** (CDE, Kläy)
B104 W2: **Integrative Development** (Graz Model, Mader et al.)
W3: is now W6
B106* Posters

18:30 Welcome drinks / apéro

Thursday, September 16, Auditoire Olivier Reverdin (B106), Uni Bastions

08:15 – 09:00 Registration

09:00 – 10:30 Plenary 1 – Health
Transdisciplinary Research: Persistent Challenges and Potential Solutions
Speaker 1:
Frank Kessel, U of New Mexico

Transdisciplinarity and Health
Speaker 2:
Jakob Zinsstag, U of Basel

10:30 – 11:00 Coffee break

* room: foyer outside B106.

The posters will stay there during the whole conference duration.

11:00 – 12:30 Plenary 2 – Culture and New Media
**Processpatching as a Method of Implementing
Transdisciplinarity in Practice**
Speaker 1:
Anne Nigten, The Patching Zone, Rotterdam
Science as Culture
Speaker 2:
Larissa Krainer, U of Klagenfurt

12:30 – 13:30 Lunch break

13:30 - 15:00 Parallel Sessions II: Workshops 4-5, Papers 1-3

B105 W4: **Education in Schools** (Boix & Caviola)

W5: cancelled

B104 P1: **Policies: Health and City Planning**
(Jones, Iwarsson)

B108 P2: **Tools: Translations**
(Darbellay/Hanson, Schulz et al., Bearth)

B111 P3: **Management and Transition Strategie**
(Braden, Kueffer, Luthe)

15:00 – 15:30 Coffee break

15:30-17:00 Parallel Sessions III: Workshop 6, Papers 4-6

B105 W6: **“Idée Suisse”** (Perrin et al.)

B104 P4: **Tools: Curricula and Publications**
(Schmidt, Frodeman, Zimmermann et al.)

B108 P5: **Education and Urban Planning for Public Health**
(McBride/Haire-Joshu, Haas, Moudon)

B111 P6: **Research Programmes**
(Crole-Rees, Lyall et al., Heim et al.)

17:00 - 17:30 Pause

17:30 – 18:30 Award Ceremony «swiss-academies award for
transdisciplinary research 2010»

Laudatio:

Peter Suter, President of the Swiss Academies of
Arts and Sciences

19:30 Conference Dinner

Friday, September 17, Auditoire Olivier Reverdin (B106), Uni Bastions

09:00 – 10:30 Plenary 3 – Urban Planning & Participatory Approaches

Transdisciplinarity at Work in Architecture and Urban Planning: The Case of GIRBa in Quebec City, Canada

Speaker 1:

Carole Després, U of Laval

Systemic Limitations of Citizen Participation in Dominant Policymaking Regimes

Speaker 2:

Aant Elzinga, U of Gothenburg

10:30 – 11:00 Coffee break

11:00 – 12:30 Parallel Sessions IV: Workshop 7, Papers 7 and 8

B105 W7: **Shaping Sustainable Urban Futures** (Pohl/Polk et al.)

B104 P7: **Social Learning** (Beecroft/Plagnat/Dao, Stavinschi)

B108 P8: **Skills and Education for Sustainability**
(Dyball, Fortuin, Haas/Smetschka)

12:30 – 13:30 Lunch break

13:30 – 15:00 Parallel Sessions V: Workshop 8, Papers 9 and 10

B105 W8: **National Research Programmes**
(SNF, Butz/Pohl, Fry, Stuckelberger)

B104 P9: **Education and Policies: Water and Sanitation Issues** (Tempelhoff, Sigel, Brundiers/Redman)

B108 P10: **Theory and Terminology**
(Glickman, Holbrook, Ukowitz)

15:00 – 15:30 Coffee break

15:30 – 17:00 **Panel**

Transdisciplinarity and Action Research

Morten Levin, The Norwegian U of Science and Technology, Norway (input), Other panelists: **Aant Elzinga**, **Larissa Krainer** and **Roland W. Scholz**

Chair: **Roderick Lawrence**, td-net

17:00 – 17:30 **Lessons learned and looking ahead**

ENDE

Table of Contents

Speakers

Carole Deprés	7
Aant Elzinga	7
Frank Kessel.....	8
Larissa Krainer	8
Morten Levin.....	9
Anne Nigten.....	9
Roland W. Scholz	9
Jakob Zinsstag	10

Abstracts: Keynotes

Goals, Functions and Products of Transdisciplinarity	11
Transdisciplinary Research: Persistent Challenges and Potential Solutions	12
Transdisciplinarity and Health	13
Processpatching as a Method of Implementing Transdisciplinarity in Practice	14
Science as Culture	15
Transdisciplinarity at Work in Architecture and Urban Planning: The Case of GIRBa in Quebec City, Canada	15
Systemic Limitations of Citizen Participation in Dominant Policymaking Regimes.....	16

Abstracts: Workshops and paper sessions

Workshop 1	19	Paper Session 1	26
Workshop 2	20	Paper Session 2	28
Workshop 3	see W6	Paper Session 3	32
Workshop 4	25	Paper Session 4	37
Workshop 5	cancelled	Paper Session 5	40
Workshop 6	36	Paper Session 6	44
Workshop 7	48	Paper Session 7	49
Workshop 8	55	Paper Session 8	51
		Paper Session 9	56
Poster Presentations	21	Paper Session 10	59

Voices of the community

A Collection of Statements on «Implementation».....	63
---	----

swiss-academies award for transdisciplinary research

Ceremony 2010.....	66
--------------------	----

Mercator Foundation Switzerland

Portrait.....	68
---------------	----

Keynote speakers

Carole Deprés is Professor of architecture and urban design at Laval University in Quebec City, Canada since 1989. She holds a professional degree in architecture and a Master's of Science from the same University, as well as a Ph.D. in Environment-Behavior Studies from the University of Wisconsin-Milwaukee in the United States where she studied under sociologist-social ecologist Sherry Ahrentzen, architect-anthropologist Amos Rapoport and architect-environmental psychologist Linda Groat. She was the head of graduate programs in architectural sciences from 1996 to 2006, before taking over the direction of Laval University multi-disciplinary Planning and Development Research Center (CRAD). In 2007, she received a Service Award from the Association of Collegiate Schools of Architecture (ACSA) for her contribution to architectural education. She is the co-founder of the Interdisciplinary Research Group on Suburbs (GIRBa) whose mission is to understand, imagine and act on aging suburbs in relationship with limited demographic growth, ongoing urban sprawl and the necessity of sustainable development. Després's research and teaching deal with residential environments and behaviours, and favours back and forth between fundamental research, action research, and design. Her work includes the development of processes aimed at bridging the gap between knowledge and practice, namely through consensus-building and participatory design. Recent publications include "Implementing transdisciplinarity: Architecture and urban planning at work", In *Transdisciplinary Knowledge Production in Architecture and Urbanism: Towards hybrid modes of inquiry*, Springer Verlag (forthcoming); "When mobility makes sense: A qualitative and longitudinal study of the daily mobility of the elderly", *Journal of Environmental Psychology* (2010); "Fighting teenagers' sedentarity: The challenges of mobility in exurbia", *Environment and Human Behaviour* (2008); "Retrofitting post-war suburbs: A collaborative planning process", In *Handbook of Transdisciplinary Research* (2008); "Collaborative planning and design for a sustainable neighborhood on Quebec City's university campus", In *Urban Sustainability through Environmental Design* (2007).

Aant Elzinga is a Professor emeritus at the University of Gothenburg. He was born in the Netherlands, grew up and pursued undergraduate studies in Canada, further studies in the UK and did a PhD in Sweden. Intellectually he migrated between disciplines. During the occupancy (1986-2002) of the Chair in Theory of Science at Gothenburg he was involved in many interdisciplinary projects, among other on the emergence of new disciplines and also taught courses for PhD students in all sections at the Chalmers Technological Institute (Gothenburg). He has participated in and led inter-

national panels evaluating the dynamics of research in the humanities, among other in Switzerland, where he after the millennium-shift was a guest professor at the Collegium Helveticum, Zürich. His recent writings include work on climate as research and politics, the history of international polar years, ice core drilling in Antarctica, as well as on the impact of globalisation in academe. In the mid-1980s he was a science adviser to the Canadian government. 1991-1998 he was president of the European Association for the Study of Science and Technology (EASST).

Frank Kessel is a Professor in the Department of Individual, Family and Community Education, and a Senior Fellow in the Robert Wood Johnson Foundation Center for Health Policy, at the University of New Mexico (in Albuquerque). Prior to joining UNM, he served for 12 years as Program Director for the Culture, Health and Human Development Program at the Social Science Research Council in New York. A Fellow of both the American Psychological Association and the Association for Psychological Science, Kessel received his Ph.D. from the University of Minnesota and his M.A. at the University of Cape Town, and has held academic positions at the University of Houston, the University of Alberta, and the University of Cape Town. Among his publications: *Interdisciplinary Research: Case Studies from Health and Social Science* (co-edited with Patricia Rosenfield and Norman Anderson); *Sigmund Koch: Psychology in Human Context – Essays in Dissidence and Reconstruction* (co-edited with David Finkelman); *Contemporary Constructions of the Child: Essays in Honor of William Kessen* (co-edited with Marc Bornstein and Arnold Sameroff); *The Child and Other Cultural Inventions* (co-edited with Alexander Siegel); and *The Development of Language and Language Researchers: Essays in Honor of Roger Brown*.

Larissa Krainer is Professor for Communication Science at the University of Klagenfurt. She studied Philosophy as well as Media and Communication Science in Klagenfurt where she graduated in 1994 with an MA dissertation on magazines for women in Austria. From 1986-1995 she worked as a journalist for different local and national media and from 1995-1997 she was the regional manager of amnesty international. Since 1998 she has been based again at the University of Klagenfurt (first as the Head of the Department of Intervention Research and Cultural Sustainability and, since 2009, in the Department of Media and Communication Science) where she qualified in 2001 for lecturing in Media Ethics. She has contributed substantially to Process Ethics, Transdisciplinary and Intervention Research, Conflict Management, Media Pedagogy and Organizational Communication. Recent book publications (in German) she co-edited and contributed to recently are: *Kulturelle Nachhaltigkeit* (2009) and *Prozessethik* (2010).

Morten Levin is a Professor at the Department of Industrial Economics and Technology Management, The Faculty of Social Sciences and Technology Management at the Norwegian University of Science and Technology in Trondheim, Norway. He holds graduate degrees in engineering and in sociology. Throughout his professional life, he has worked as an action researcher with a particular focus on processes and structures of social change in the relationships between technology and organization. The action research has taken place in industrial contexts, in local communities, and in university teaching where he has developed and been in charge of a three sequential PhD programs in action research. He is author of a number of books and articles, including *Introduction to Action Research: Social Research for Social Change*, and serves on the editorial boards of *Systemic Practice and Action Research*, *Action Research International*, *Action Research*, *The Handbook of Qualitative Inquiry*, and *The Handbook of Action Research*.

Anne Nigten is the director of The Patchingzone, a praxis laboratory where Master, PhD students and professionals work together on meaningful creative content. Prior to her current position, she was the manager of V2_Lab, the aRt&D department of V2_, Institute for the Unstable Media in Rotterdam, the Netherlands. She is lecturing on research and development in the interdisciplinary field from an art perspective. She is adviser for several media art and science initiatives in the Netherlands and Europe. She completed her PhD at the University of the Arts London (UK), and frequently publishes papers on art, engineering and (computer) science collaboration and software development. Before her current position at V2_ she has been working as an independent media artist, and simultaneously fulfilled several management jobs for the media art sector in the Netherlands. Further information: <http://patchingzone.net>

Roland W. Scholz holds the Chair of Environmental Sciences: Natural and Social Science Interface at the Swiss Federal Institute of Technology (ETH Zurich, Switzerland). He is adjunct professor of Psychology at the University of Zurich (Privatdozent), and was elected as the fifth holder of the King Carl XVI Gustaf's Professorship 2001/2002 hosted at the Center of Environment and Sustainability of Chalmers University of Technology and Gothenborg University (Sweden). Since 2002, he is the speaker of the International Transdisciplinarity Network on Case Study Teaching (ITdNet). Scholz graduated in Mathematics, Psychology, and Educational Sciences (Dipl.-Math.), Social Psychology (Dr. phil., University of Mannheim), and Cognitive Psychology (Dr. phil. habil.). Scholz specialized in decision sciences and systems analysis, cognitive and organizational psychology, and environmental modeling, evaluation and risk assessment. His

current research field is environmental decision making in human-environment interactions and the theory, methodology and practice of transdisciplinary sustainable transition processes. Since 1994 he has been annually performing transdisciplinary ETH-UNS case studies on sustainable urban, regional, and organizational development.

Jakob Zinsstag graduated with a doctorate in veterinary medicine on Salmonella diagnosis at the Veterinary Faculty of the University of Berne in 1986. He worked in rural practice and as post doctoral fellow on trypanosomiasis research at the Swiss Tropical Institute. From 1990 to end of 1998 he led a livestock research project at the International Trypanotolerance Centre in The Gambia and directed the Centre Suisse de Recherches Scientifiques in Abidjan, Côte d'Ivoire. Since 1998 he leads a research unit at the Swiss Tropical and Public Health Institute in Basel on the interface of human and animal health with a focus on health of nomadic people and control of zoonoses in developing countries under the paradigm of "one health" (a project that received the td-award 2004). He holds a PhD in Tropical Animal Health and is a Professor of Epidemiology at the University of Basel. He is a diplomate of the European College of Veterinary Public Health.

Abstracts: Keynotes

Wednesday, September 15, Auditoire Olivier Reverdin (B106),
Opening keynote, 15:15 - 16:00

Goals, Functions and Products of Transdisciplinarity

Speaker: **Roland W. Scholz** (Zurich, Switzerland)
co-authored by **Michael Stauffacher**

Transdisciplinarity has become a third mode of science, supplementing disciplinarity and interdisciplinarity. This presentation refers to the Zurich 2000 definition of transdisciplinarity¹, which describes collaboration and mutual learning among people from practice and society as a salient and necessary part of transdisciplinarity. We show that and how transdisciplinarity differs from consultancy, participatory research, public participation, or action research. Our presentation draws from the experience with 30 Transdisciplinary Case Studies on sustainable transitions of urban or regional systems, organizations and policy processes.² On the average, each of these studies included about 100 practitioners.

Transdisciplinary processes can serve at least four functions for facing environmental challenges of the 21st century, work that calls for a crisis management approach. These functions are (1) capacity building, (2) consensus building, (3) mediation, and (4) legitimization. In transdisciplinary processes legitimized decision makers, scientists and stakeholders or agents from the public at large collaborate for developing robust orientations for sustainable transitions or – referring to Gibbons and Nowotny – socially robust knowledge. Td processes generate socially robust knowledge that is a “form of epistemics, which (i) meets state of the art scientific knowledge, (ii) has the potential to attract consensus, and thus must be understandable by all stakeholder groups, (iii) acknowledges the uncertainties and incompleteness inherent in any type of knowledge about processes of the universe, (iv) generates processes of knowledge integration of different types of epistemics (e.g. scientific and experiential knowledge, utilizing and relating disciplinary knowledge from the social, natural, and engineering sciences), (v) considers the constraints

-
- 1 Thompson Klein, J., Grossenbacher-Mansuy, W., Häberli, R., Bill, A., Scholz, R. W., & Welti, M. (Eds.). (2001). *Transdisciplinarity: Joint problem solving among science, technology, and society. An effective way for managing complexity*. Basel: Birkhäuser.
 - 2 Scholz, R. W. & Tietje, O. (2002). *Embedded Case Study Methods: Integrating quantitative and qualitative knowledge*. Thousand Oaks: Sage.

given by the context both of generating and utilizing knowledge.”³

The presentation reflects on the roles decision makers, scientists and other stakeholder can take in transdisciplinary processes and reveals why the ‘implementation problem’ is genuinely involved in a transdisciplinary case study from its very beginning.

-
- 3 Scholz, R. W. (2011). *Environmental Literacy in Science and Society: From knowledge to decisions*. Cambridge: Cambridge University Press.

Thursday, September 16, Auditoire Olivier Reverdin (B106),
Plenary 1 – Health, 09:00 - 10:30

**Transdisciplinary Research:
Persistent Challenges and Potential Solutions**

Speaker: **Frank Kessel** (New Mexico, USA)

co-authored by **Patricia Rosenfield** (New York, USA)

At least two persistent challenges confront practitioners of Transdisciplinary Research (TD-Res): First, the formation of the research team and the related shaping of an approach that requires the synthesis of conceptual, theoretical, and methodological assumptions drawn from different disciplinary paradigms – the research conduct challenge. And second, the implementation challenge – the connection of TD-Res with the potential users of the research results, i.e., practitioners, policymakers, and the public. In this presentation we introduce potential solution-building approaches for these challenges in the context of TD-Res relating to topics such as disease-control programs, health systems, and health-professional education.

To address the research conduct challenge, we propose drawing on Heterarchy, a concept and approach (derived from work in cognitive science and elsewhere) for analysing multi-layer, multi-level problems. To address the implementation challenge, we propose drawing on Panarchy, a concept and approach (derived from work in international relations) for building connections across leaderless networks, e.g., heterarchical networks such as TD-Res teams and user communities. In our concluding comments, we will also briefly address a third persistent challenge, viz., the proof-positive challenge – how to meet the expectation, or demand, for demonstrating – via evidence and rhetoric – the comparative effectiveness of appropriately conducted and implemented TD-Res. By proposing potential solutions to these challenges, we aim to broaden understanding, application and acceptance of TD-Res, and thus increase the likelihood that it will help provide robust improvements in human and societal well-being.

Transdisciplinarity and Health

Speaker: **Jakob Zinsstag** (Basel, Switzerland)
co-authored by **Marcel Tanner**

Recently, we celebrated the 30th anniversary of the declaration of Alma Ata (Almaty, 1978), declaring health as a universal human right and establishing the primary health care (PHC) strategy, emphasizing the unacceptable inequality in the health status of the people between developed and developing countries, and aiming at an acceptable level of health for all people by the year 2000. The comprehensive and integrated PHC strategy also entailed that people have the right and the duty to participate in the planning and implementation of their health and well-being, clearly reflecting a transdisciplinary foundation. It further recommended an integrated approach, involving other sectors, particularly agriculture, water and sanitation, animal husbandry and education. Today, we have to admit, that we are still far from achieving the aims of the PHC declaration of Alma Ata, or the ambitious targets of the millennium development goals in most parts of our world. It is also in this context and recognizing the values of PHC, that 30 years after the Alma Ata declaration, the World Health Report 2008 was devoted again to PHC – “PHC now – more than ever”. Despite increased funding from public, private and charity sources and new efforts, like internationally concerted actions such as the Global Fund to fight HIV/AIDS, tuberculosis and malaria (GFATM), inequalities in health status have even increased in many areas of the world.

We recognize a major gap between systems knowledge and its effective application and examine here the current status and potential of transdisciplinary approaches based on four specific examples in the African context. First, the governments of Tanzania, Kenya and Uganda recognized the divide between science and policy for health and recently founded the REACH policy initiative (www.eac.int/health) which formally links research and policy in these countries and positively affects the national and regional levels. Second, networks for disease surveillance have been founded in Eastern- and Southern Africa which – besides formal approaches- include participatory epidemiology involving communities. Third, the Tanzania Essential Health Intervention project (TEHIP) built on decentralized (district level) health planning and demonstrated how a systems intervention for rational planning, priority setting and resources allocation of 1 USD per capita improved health systems performance and directly contributed to the reduction of mortality rates making reaching the MDGs in Tanzania a reality. Fourth, our experience with the development of the “one medicine” towards a “one-health” strategy by tapping the potential of closer cooperation between human and animal health shows how intersectoral cooperation, involving authorities and communities improve health outcomes, health care delivery and

advances in the control of zoonoses. The guiding concept of all four examples is a paradigm shift from concepts of maximizing good health and cost-effectiveness towards reducing burden and reaching equity effectiveness with great cost-benefit. This paradigm shift is only possible when based on transdisciplinary foundations. Strengthened international and intersectoral collaboration together with transdisciplinary approaches, involving authorities, communities and scientists are part of the Archimedian point of leverage aiming at reducing the many shocking inequalities world wide.

Thursday, September 16, Auditoire Olivier Reverdin (B106),
Plenary 2 – Culture and New Media, 11:00 - 12:30

Processpatching as a Method of Implementing Transdisciplinarity in Practice

Speaker: **Anne Nigten** (Rotterdam, Netherlands)

The Patching Zone (www.patchingzone.net) is a transdisciplinary laboratory for innovation where Master, PhD and Postdoc students as well as young professionals from different backgrounds create meaningful content. In our laboratories the students and researchers work together, supervised by experts, on commissions with creative use of high-tech materials, digital media and/or information technology. The Patching Zone brings together people who are interested in building a shared practice. The participants come from a range of educational programs such as art schools, design schools, social and computer sciences, technical programs, and industry. Moreover, The Patching Zone bridges the gap between specialized education and today's media and technology-dominated collaborative practice.

The Patching Zone applies the 'Processpatching' approach that is defined by its initiator's (Anne Nigten) PhD thesis (2007) as its main methodology for creative research and development. Processpatching refers to the research and development process of electronic or interactive art (aRt&D) and novel transdisciplinary processes, where different kinds of techniques, methods and knowledge are stitched together and lead to more than the sum of its parts.

Over the last years the 'Processpatching' method has been used to improve collaboration among a broad range of disciplines that are involved in what we call 'complex issues'. It turned out to be especially relevant for complex issues such as urban regeneration processes, professional reorientations in the traditional art fields (set in motion through digital revolution) and reorganization processes. All these projects are place-holders for various interrelated (complex) issues that benefit from a multiple-perspective research and new views on end-user or consumer participation. The

presentation will highlight four case studies from the Patching Zone's practice. We'll show the analyses of each project's tailor-made 'Process-patching' method, the outcomes (results) and effects. The presentation will bring forward our approach to deal with

- a) transdisciplinary methodological challenges,
- b) challenges for combined qualitative and quantitative research,
- c) the practical implementation of processpatching as an approach for transdisciplinary teams and
- d) the inclusion of the end-user or participant in the research, development and implementation process cycles.

Science as Culture

Speaker: **Larissa Krainer** (Klagenfurt, Austria)

Transdisciplinary Research can be seen as an attempt to establish a new culture of science. Intervention Research tries to link problems of society with the scientific knowledge and to organize a research process that invites people concerned to participate in it. Therefore, we do not understand implementation in a technical way, in the sense that science produces results, which could directly be transferred into action by practical technicians, but as an ongoing process in our problem-oriented work. There are different steps of implementation in our research process: 1. implementation of shared knowledge of the research topic, task and methods, 2. implementation of a mixed, transdisciplinary community, 3. implementation of structures, 4. implementation of a process of decision making. These steps will be presented on the basis of a concrete research example. Finally, the cultural turn within research should be discussed as a turn to a more sustainable science.

Friday, September 17, Auditoire Olivier Reverdin (B106),
Plenary 3 – Urban Planning & Participatory Approaches,
09:00 - 10:30

Transdisciplinarity at Work in Architecture and Urban Planning: The Case of GIRBa in Quebec City, Canada

Speaker: **Carole Després** (Laval, Canada)

In my keynote address, I wish to illustrate how and why architecture and planning are disciplines and professions predisposed for transdisciplinarity, and to point out at challenges facing both associated academic programs and professional organizations in terms of revising teaching models and training methods. I will do so by describing the work that GIRBa – the Interdisciplinary Research Group on Suburbs at Laval University – has

been conducting for over ten years in Quebec City, Canada around the issues of aging suburbs, urban sprawl and the necessity of sustainable development. I will explain how a transdisciplinary program of research and action gradually and almost naturally emerged as GIRBa's understanding of the complexity and multidimensionality of this space-related problem increased. The group went from the distinct production of interdisciplinary research, architectural and urban design schemes, and contractual applied research, to an integrated program of research and action where each type of knowledge nourishes the others in a truly transdisciplinary manner. My presentation is structured as follow. First, I will expose the definition of transdisciplinarity endorsed by GIRBa and highlight the nature of architecture and urban planning as multidisciplinary disciplines and action-oriented professions. Second, I will explain how GIRBa profited from the complementary nature of architecture and urban planning in defining its research and action program. I will show how the group operates through back and forth between practiced-based research, evidenced-based design, and collaborative processes to identify and implement strategies to counter urban sprawl and its negative consequences on sustainability. Third, I will highlight the limitations and strengths of GIRBa's work, namely its limited capacity within academia to implement design solutions and policies, in contrast with its assured capacity to empower decision-makers and future generations of architects, planners and social scientists with an understanding of the complexity of urban problems, and a concrete experience of how to operate within a transdisciplinary mode of knowledge production to identify solutions.

Systemic Limitations of Citizen Participation in Dominant Policymaking Regimes

Speaker: **Aant Elzinga** (Gothenburg, Sweden)

The paper is conceptual. The role of public(s) in policy implementation appears in the framing legitimation, and evaluation of research-based measures. Over the years vocabulary has changed from focus on "users" to emphasizing "citizens", from government to "governance", and from inter-"action" to "participation" or public "engagement". This reflects transition away from structural skew and dominance favouring power elites and bureaucracies that generated a culture of political control, excluding "voiceless" people. Now, instead, private sector methods and quasi-markets foster new norms driving planning and implementation. The new paradigm – New Public Management (NPM) – certainly opens spaces for participation. Nevertheless, case studies on PUS show genuine citizen influence is scarce. Surprise? I argue that participation is limited because people are essentially framed in their

position as customers and clients (rather than citizens). Participation and consultation resembles market research, opinion polling and PR in market-driven companies or enterprises. A gap remains between “citizen” involvement in word and deed. In the history and theory of urban planning Sherry R. Arnstein’s paper, “A Ladder of Citizen Participation” (1969) forms a critical benchmark pinpointing traditional deficits in the policy-making process embedded in public bureaucracies and dominated by power elites. Her primary categories – non-participation, tokenism, and participation – will be used to probe planning and implementation regimes co-evolved with NPM (peaking in the 1990s, now declining), spurred by neoliberalism. Explanation of current deficits requires analysis of key characteristics of NPM inscribed in infrastructural planning: agencyfication, contractualization, marketization, replacement of trust by systemic mistrust, performance measures, Audit Society, etc. All too often case studies fail to grasp this broader *context*.

Friday, September 17, Auditoire Olivier Reverdin (B106),
Panel – Transdisciplinarity and Action Research,
15:30 - 17:00

Chair: **Roderick Lawrence**

Panelists: **Aant Elzinga, Larissa Krainer and Roland W. Scholz**

Input: **Morten Levin** (Trondheim, Norway)

Action Research and Transdisciplinarity

The presentation starts by introducing the essential elements of AR:

The democratic perspective- the participative element

AR is a joint knowledge generation process where social scientist and problem owners integrate in the same research (learning) process.

The contextual argument

AR aims at solving practical problems that are defined in the local context.

The research contribution

AR produces research for the scientific community finding research issues in the real world.

After this introduction I will give a brief overview of diverse practices in AR – AR is multifaceted and diverse.

The second half of the presentation will deal with transdisciplinarity. The essential AR argument is that if you intend to solve/approach real life problems there is no reason to anticipate that the scientific world is divided in professions that can cover the necessary perspectives to enable a solution to the actual problems. It is, given the AR perspective, so obvious that all problems worth researching are transdisciplinary.

Why is it so that transdisciplinarity have such a low academic status? Embark on a short discussion on professional power and academic rigidity. A deep understanding av of limited intellectual space is more worth then a broad and integrated understanding.

The final argument will be on how universities (higher education) must change in order too accommodate transdisciplinary capability for students.

Workshop 1: room: B105

Transdisciplinary Learning for Sustainability.

Workshop for exchange of experience in stimulating learning processes through action research

Organizer: *Andreas Kläy* and *Gudrun Schwilch*, CDE, University of Bern, Switzerland, and *Naim Liniger*, independent expert, CDE, University of Bern

Keywords: Transdisciplinary learning, sustainable development, integration of perceptions, empowerment

Socially and ecologically unsustainable development is deeply rooted in contradicting world views and values that shape the institutions of societies. The ongoing discourse on these contradictions opens pathways for sustainable development (SD). Research can contribute to SD in two ways: 1) by providing a platform and stimuli for societal innovation, e.g. creating awareness of possibilities and implementation strategies among communities where the SD is to take place, and 2) by supporting reflection on societal development and the roles of actors (stakeholders) and institutions in this process, including the role of research itself and the responsibilities of researchers, teachers and scientific institutions. In current research practices, the potential for these types of contribution is far from to being tapped to the full.

In response to this, the Centre for Development and Environment (CDE) of the University of Bern has developed an innovative concept to stimulate learning in the context of development and research projects in international cooperation: the Learning for Sustainability (LforS) approach. Since 1996 CDE has accumulated a wide range of experience in using this approach in sustainable resource management and regional development. Experiences include grassroots development work in different fields ranging from resource management to health, as well as management of transdisciplinary research programmes and training of trainers. We perceive LforS as one specific approach among a broad spectrum of concepts that includes both research and development and, most importantly, involves learning at the grassroots level, thereby contributing to the empowerment of communities. These concepts are currently still rather isolated from each other; forging links between them could contribute to their mainstreaming in research and development practice. Therefore, the time seems ripe to link this wealth of experience with the increasingly important concept of transdisciplinary learning at the grassroots level, i.e. participatory research involving actors affected by the research from the very beginning and as emancipated participants in the research process for SD.

The workshop proposed here will involve three people of CDE: Andreas Kläy, who helped develop the LforS approach, has conducted many LforS workshops, and is involved in the continued elaboration of concepts, guidelines and instruments for LforS; Naim Liniger, who has elaborated concepts and guidelines for LforS workshops in the field of health and has conducted several workshops; and Gudrun Schwilch, who integrated the LforS approach into the DESIRE research programme for the participatory appraisal and selection of sustainable land management strategies to combat desertification.

The workshop will offer an opportunity to share the LforS experience with other participants.

In order to facilitate the integration of other (non-LforS) experiences, we invite interested contributors to participate in the planning of the workshop. The objective will be to consolidate the present broad range of concepts and experiences, focusing on the main lessons learned in the practice of transdisciplinary learning for SD.

In order to identify the main characteristics of learning for sustainability, *we invite you to share your knowledge and experience* by already providing us with information based on your interest *before the conference*. Please mail to: andreas.klaey@cde.unibe.ch

Workshop 2: room: B104

**The Graz Model for Integrative Development (GMID) –
A Model for Assessment, and Planning of Processes for
Sustainable Development**

Organizer: *Clemens Mader and Marlene Trummler*, University of Graz, Austria
Keywords: Leadership, social networks, participation, education & learning

The aim of this workshop is to test and apply the Graz Model for Integrative Development (GMID) in the course of case studies contributed by the workshop facilitators as well as by the participants of the workshop.

The GMID provides an integrative approach for development processes. It is based on the five principles of: (a) Leadership, (b) Social Network, (c) Participation (d) Education & Learning as well as (e) Research integration.

The five principles are connected to each other in an integrative way, which means that they influence each other and even can strengthen or weaken their functioning either way. The model actually categorizes each of the principles into three levels and provides thereby a platform for qualitative process assessment. Furthermore the user has the opportunity to get direct advice for the further process development by applying the model. Transdisciplinarity is a core component of the model as it repre-

sents the third level of research integration. Research in the course of the development of the model has proven, that only transdisciplinary research may contribute to sustainable development.

After a short introduction on the model, participants of the workshop will test the GMID in the course of case studies and discuss possible fields of application. So far, the model which has been developed in 2009 in the course of a research programme funded by the Austrian National Bank, the GMID has been applied by numerous NGOs, private companies as well as regional actors from Austria. Furthermore the GMID has been introduced by the United Nations University – Institute for Advances Studies as basic assessment model in connection to annual reports of more than 70 Regional Centres of Expertise on Education for Sustainable Development situated around the world. One of the main reasons for UNU-IAS to use GMID as assessment model was the possibility for its flexible application regardless of the type of the process, geographical region (process culture) & regional impact (size).

Poster Presentations: room: B106 | chair: Manuela Rossini

The groups will present their research in front of the posters during this time slot only, 30 minutes each (including discussion time).
The posters will stay there during the whole conference duration.

1

cADP – collaborative Advanced Design Project

Author: *Alexandra Feith*, TU Darmstadt, Germany. Co-authors: *Sinja Röbig*, *Christina König* and *Jürgen Rambo*.

Keywords: Design education, collaborative product development, ergonomics, sociolinguistics

This poster presents two approaches of an interdisciplinary collaboration. On the one hand it will introduce the course collaborative Advanced Design Project (cADP) at TU Darmstadt, which is a unique course that was created for collaboration between the two disciplines mechanical engineering and industrial design, and on the other hand it presents the present monitoring study of this course.

Although interdisciplinary teamwork is usually no part of the tertiary education, in many cases students have to work in interdisciplinary teams after their graduation, where single experts from one discipline are arranged for temporary projects.

cADP is developed from a compulsory course in mechanical engineering at TU Darmstadt for its advanced students, where students work together in a team to complete an engineering task. Three departments of

mechanical engineering, Department of Computer Integrated Design, Institute of Ergonomics, and the Department of Product Development and Machine Elements of TU Darmstadt, and the Department of Industrial Design of the University of Applied Sciences in Darmstadt join for the collaborative course. Objective for the course achievement is to create an ergonomic and design-oriented product from its first idea to a virtual prototype.

In order to support the collaboration of team members, computer-aided tools and methods are provided to support their organization and communication. The method is called “design mapping”. It is based on systems theory principles and easy to learn mapping techniques from psychology and pedagogy like mind mapping, dialogue mapping or concept mapping (Rambo et al. 2008). To support the method the client-server-software Cmap-Tools allows students to file their data according to network-like structures.

Parallel to this course monitoring studies from the background of product development methods and psychology observe the collaboration of team members during the project. A present study on language for special purpose (LSP) of the Department of Linguistics and Institute of Ergonomics of TU Darmstadt analyzes language that was used during team meetings. At three different stages of the course spoken data was recorded, in addition to written material, such as e-mail correspondence, VoIP, drafts, and reports. Spoken and written data will be prepared for a corpus analysis and analyzed concerning actual linguistic material according to lexical and grammatical features. The basis for this analysis is systemic-functional grammar (Halliday 1985). This study examines the influence of interdisciplinary collaboration on LSP and will describe register variants (Biber & Finegan 1994) that are given in this special corpus.

2

Developing a Framework for the Mitigation of Geogenic Contamination

Author: *Annette Johnson*, Eawag Dübendorf, Switzerland.

Co-authors: *K. Abbaspour, M. Amini, H.P. Bader, M. Berg, T. Ewen, A. Gonzalez, S. Hug, J. Inauen, R. Johnston, N. Kahn, L. Rodriguez Lado, H.-J. Mosler, L. Osterwalder, R. Scheidegger, R. Tobias, and H. Yang.*

Keywords: water quality, mitigation, framework

Geogenic contaminants in groundwater affect the health of millions of people worldwide, particularly in areas where alternative sources of drinking water are scarce. Even where alternative water sources exist, water treatment is often required. The assessment of potential water sources and the implementation of water treatment technologies are thus both critical for populations relying on contaminated water. Socio-political factors,

such as institutional support and community needs are essential for sustainable implementation of mitigation options.

The Water Resource Quality project is an interdisciplinary project that aims to develop a framework for the mitigation of geogenic contamination in groundwater, in particular, arsenic and fluoride. The development of a mitigation tool will help decision makers and water resource managers to identify contaminated regions and provide feasible options to help reduce contamination, as well as providing practical tools for practitioners. Such a tool relies on the integration of different disciplines and requires the understanding of the physical system, together with socio-economic and behavioural factors at different scales.

In a first step, we have developed the methodology for modelling probability maps to identify regions at risk of groundwater contaminated with arsenic and fluoride on global and regional scales. We are currently combining these tools with the Soil and Water Assessment Tool (SWAT) to assess alternative water resources. These models of water resource quantity and quality will be interpreted with the use of advanced but user-friendly data visualization and analysis tools, to identify mitigation options based on alternative water resources where possible.

Based on case studies on fluoride contamination in Ethiopia and arsenic contamination in Bangladesh, the components of the mitigation framework will be developed. The Bangladesh case study focuses on understanding the technical and socio-political factors that contribute to the choice of mitigation options, their function and sustainability. In Bangladesh, mitigation options, such as well switching, deep tube wells, water filters, rainwater harvesting and surface water treatment are all being used. The Ethiopia case study focuses on the testing of water filters, as alternative sources of water in the Rift Valley are not common. Very few mitigation options have been implemented and, together with our Ethiopian partners, we are assessing the technical function as well as the acceptance of the filters and institutional factors that will lead to sustainable implementation.

3

Transdisciplinary Projects! Transdisciplinary Texts?

Author: *Ekaterina Zakharova*, Darmstadt University of Technology, Germany.

Keywords: Project communication, collaborative writing, textual analysis of specialized discourse

Inter- and transdisciplinary projects are characterized by a high problem complexity and by large number of projects partners. One of the main challenges in such projects is the collaborative production of different kinds of texts (from project draft to final report). Project partners are

obliged to share their discipline-specific approaches with each other and to adjust their very different knowledge to give a shape to daily transdisciplinary work.

The main aim of this poster is to provide an overview of collaborative writing processes. This topic is still a desideratum in the research field of Language for Specific Purposes and discourse analysis of text production in ID/TD projects. The empirical study aimed to gain explicit information about the collaborative writing:

Where and when do conflicts in the collaborative text production arise?
What are the “sore” points?

Which strategies are used to solve these kind of problems?

The study is illustrated with two examples from long-term linguistic fieldwork in two interdisciplinary projects. In the first project, scientists from Physics and Political Sciences are trying to find new technical solutions as well as creating political instruments for a new nuclear order. The 3-year project started at the end of 2008 and is now getting into its research core phase. The second project “I know that I know nothing” brings together analytic and practical perspectives with a focus especially on the linguistic and communicative manner of dealing with ignorance, be it by flagging temporary knowledge-gaps or by acknowledging more permanent limits of knowledge. A case-study serves as a common referent. It concerns predictions regarding the effects of biofuel-production on land-use and it is therefore of considerable public interest and hence subject to the pressure to produce success-stories. Moreover, it runs up against the limits of predictive power, and needs to incorporate unknowns into its models.

The research corpus consists of:

- Project drafts (all versions)
- Project applications (all versions)
- Project presentations (all versions)
- Interviews
- Emails

The results provide knowledge about the solution strategies in collaborative text production. They can be used for transdisciplinary everyday praxis and also by language professionals for acquiring knowledge about the analysis of specialized discourse.

4

Research: Human Ecology Group, Institute of Environmental Sciences, University of Geneva

In addition, the Human Ecology Group (directed by *Roderick Lawrence*), the institutional conference partner hosting the conference presents its research and programmes.

Workshop 4: room: B105

Implementing Quality ID Education:

Cognitive, didactic and institutional consideration

Organizer: *Veronica Boix Mansilla*, Principal Investigator, Harvard Graduate School of Education, USA, and *Hugo Caviola*, Institut für Gymnasial- und Berufspädagogik, Universität Zürich and Gymnasium Liestal, Switzerland

In this workshop we will engage in a conversation about three key dimensions of quality interdisciplinary education practice: cognitive, didactic, and institutional.

We will ask: 1. What constitutes deep interdisciplinary understanding (cognitive dimension)? 2. What are parameters for quality interdisciplinary instruction (didactic dimension)? 3. What organizational conditions enable quality interdisciplinary education to take roots (institutional dimension)?

Our exchange will be informed by research findings from two countries and institutions: the University of Zurich (Institut für Gymnasial- Berufspädagogik, IGB) has investigated the current practice of interdisciplinary teaching in school development initiatives and offers from its findings a set of criteria that can serve as a ‘tool kit’ for the implementation of quality interdisciplinary teaching.

In turn the Harvard Interdisciplinary Studies Project at Project Zero has developed the “Teaching for Interdisciplinary Understanding Framework” through an extensive action-research project. The framework puts forth actionable principles for teaching designs distilled from best practices in interdisciplinary instruction to inform quality teaching and learning.

Participants will have an opportunity to reflect about the similarities and differences between the findings shared and their own practice and contexts.

1.1

Learning from Health Policy Implementation:

The interaction of ideas, interests, and institutions

Ruth J. E. Jones, Canadian Academy of the Arts, Canada.

Keywords: Health policy, policy innovations, neo-institutional framework

The adage that we must not forget the lessons of the past has never been more relevant than today. These lessons are becoming increasingly important as we witness and welcome the blurring of boundaries between researchers and practitioners across the disciplines and as exciting, innovative approaches to theory, evidence, and practice are applied to the flow from knowledge to action.

Policy implementation in healthcare is a core part of this dynamic process. However, researchers are learning that it is neither tidy nor rational and that, in order to avoid the problems that have plagued policy implementation efforts in the past, the complex and interrelated stages of planning, design, implementation, utilization, and evaluation must be understood.

Numerous theoretical approaches are available to promote our comprehension of the knowledge-to-action flow. The Neo-Institutional Framework allows us to examine policies from the standpoint of the ideas, interests, and institutions that have been involved in their creation; how these factors tend to influence the outcome of those policies; and how they, in turn, are affected by those policies.

The ideas that have prompted shifts in health policy often reflect the societal values that are inherent in the nation being examined. For example, whereas the United States – with a strong history of states' rights and individualism – has embraced a desire for limited government intervention, Canada – with a greater focus on government intervention – has endorsed a publicly funded health care system.

The interests in healthcare matters are those of the patients, healthcare providers, and other formal and informal policy communities and networks which strive to influence the policy process to meet their individual and collective needs.

The institutions are the formal and informal organizations in the public, private and not-for-profit sectors that attempt to affect, do affect, and are affected by policy change. These institutions include not only those of federal, state, and local governments, but also unions and professional associations, as well as healthcare, pharmaceutical, and insurance companies.

As we explore the strength and location of decision-making power, the capacity of the various actors to implement policy, and the impact of intended

and unintended consequences, we must be prepared to effectively communicate our findings within and beyond the boundaries of our own discipline and effectively share the lessons that we have learned.

1.2

Implementation of Research-based Strategies to Overcome Accessibility Problems in Built Environments. Challenges and experiences during 20 years.

Susanne Iwarsson, Lund University, Sweden

Keywords: Community practice, disability, housing accessibility, housing provision, outdoor mobility

Since the early 1990's, we have engaged in the development of methodology for assessment of person-environment fit in different societal arenas, and how such dynamics interact with aspects of health. Ultimately, all projects aimed at practice implementation. Our research efforts represent:

- Methodology development, to come up with a tool-kit feasible not only for research but also for structuring practices in community-based health care as well as housing provision and city planning.
- Problem-oriented studies aimed to describe person-environment dynamics and influences on health, predominantly among older people but also among young persons with disabilities.
- Solution-oriented projects in interaction with users and practitioners, aimed to implement research-based solutions and evaluate their effects.

The interdisciplinary research team consists of senior and junior scientists representing gerontology, occupational therapy, research engineering, traffic planning, education, and sociology. A practising architect serves as a consultant.

The Enabler Concept and the Housing Enabler instrument constitute the methodological core of our research. This methodology allows for structured assessment and quantification of accessibility problems based on the notion of person-environment fit, and numerous attempts have been made to implement the use of such methodology in practice. In order to describe person-environment dynamics and to evaluate the effects of interventions, such studies rest on a platform of mixed methodologies, utilising quantitative as well as qualitative approaches in combination. Another type of studies concerns the process of implementation, focusing on e.g. attitudes among practitioners and organisational aspects fostering or hindering implementation.

Different strategies have been used, all aiming to support the process of implementation:

- Methodology courses targeting practitioners such as occupational therapists, architects and technicians, in several European countries.

- Methodology teaching included in university education for professionals, in several European countries.
- Translation and adaptation of the methodology to different national contexts.
- Piloting of research-based assessment instruments in health care, housing provision and city planning contexts, foremost in Sweden and Finland.
- Definition of needs for environmental measures in pedestrian environments, involving senior citizens in the research process, followed by the implementation of concrete measures in a defined geographical area in a Swedish town.
- Follow-up studies of different types of effects of environmental interventions based on research-based methodology, such as adherence to advices given and user satisfaction.

We conclude that to some extent our research has informed policies and practices in Sweden and other - European countries, while obvious, direct and sustainable effects in practice contexts still are scarce. Challenges faced and experiences gained will be outlined, aiming to nurture the development of interdisciplinary implementation research.

Paper session 2: Translations
room: B108 | chair: Theres Paulsen

2.1

From Implementation to Translations in Inter- and Transdisciplinary Children's Rights Research

Frédéric Darbellay and *Karl Hanson*, Institut Universitaire Kurt Bösch (IUKB)
Sion, Switzerland

Keywords: complexity, children's rights, translation

After providing a short epistemological, theoretical and conceptual outline of the *implementation* concept within inter- and transdisciplinary research, the paper will apply this concept to the emerging and multidimensional field of children's rights. From an Inter- and Transdisciplinarity perspective, we consider implementation in action as a co-productive, non-linear, non-hierarchical and reverse process of *translation*, which involves a new integration of theories, methods and practices of teaching and research across and beyond scientific disciplines and paradigms in order to describe, analyze and understand the complexity of theoretical and practical questions in children's rights.

International children's rights have primarily been approached and studied as forming part of a top-down process, whereby principles and rights enshrined in international human rights documents need to be implemented at the national and local levels. Within this view, the ultimate

aim of human rights implementation is for international norms to have an impact on the ground, in children's real lives; implementation is thereby considered as the translation of international norms into practice, from top to bottom. Our ongoing interdisciplinary research project, *Living Rights: An interdisciplinary approach to international translations of children's rights*, inverts this perspective. The project adopts a bottom up approach to children's rights by starting with children's own conceptualisations of their rights, i.e. their living rights, described as how children themselves define and make use of what they consider being their important human rights. Rather than relying on the *implementation* concept which expresses a single, one way direction, we put forward the concept *translations* which embraces a continuous process taking place both between and within the local and the international levels. It is within this understanding of translation processes as dynamic, circular and continuous practices that the project will explore space for taking into account children's living rights.

The concept *translations* relies on interdisciplinary concepts of complexity, circularity and interrelations and is a central component of our theory-developing in the children's rights field. It is our contention that the translations concept has a strong potential to serve as a rallying concept for encouraging an interdisciplinary dialogue amongst socio-legal studies, communication sciences, human geography, social anthropology, sociology, psychology and political sciences, which are perspectives that all will be engaged with during the research project. Overall, it is expected that this emphasis on an interdisciplinary approach will lead to better insights into children's rights translation processes, and in particular to developing a theory that can fully take into account the growing attention for children's living rights.

2.2

Inter- and Transdisciplinarity in Sustainable Land Management Research

Kristin Schulz, Thomas Weith, and Nadin Gaasch, Leibniz-Centre for Agricultural Landscape Research, Germany

Keywords: sustainable land management, research methodology

The relevance of scientific knowledge for all social spheres of activity rises constantly, whereas solutions are not only produced by science but also by other social actors. Land use and land management as an everyday practice in different professional fields demands scientific based solutions from more than one discipline or public province. Thus research needs to be integrated in its social contexts. In consequence cooperation and communication with various partners is indispensable to think about own research

and to realise synergy effects between research and participating stakeholders.

In January 2010 the new German research programme “Sustainable Land Management”, funded by the Federal Ministry of Education and Research (BMBF), started with emphasizing its special focus on inter- and transdisciplinary research. This includes the use and development of methodologies and concepts of research as well as innovative realizations. The authors are responsible for one of the two scientific coordination projects accompanying more than ten joint research projects which handle various issues of sustainable land management. One major aspect is to support the joint research activities by coordination, networking, dialogue, reflection and interaction.

The full paper and presentation will explain the methodological translation of transdisciplinarity into research practice and pursue the matter which ways of implementation within the joint research projects are proposed. Therefore the variety of project-drawn concepts within the research program will be analysed and evaluated. The main question is: what is the added value of inter- and transdisciplinary approaches? In consequence, current practice of inter- and transdisciplinary research towards sustainable land management will be reflected upon and assessed.

2.3

Conservation in the Aftermath of Civil War: Recasting the plot

Thomas Bearth, University of Zurich, Switzerland

Keywords: Conservation, conflict management, multilingualism, prioritization of local actors, institutional prerequisites to implementation

All over the planet, conservation plays a major role in implementing the Rio conventions on sustainable use of resources and preservation of biodiversity. Current wisdom favours the involvement of local populations, assigning them a central role in implementation, as in the case of protected areas in Africa and elsewhere (Galvin & Haller 2008). Such areas of restricted access, as e.g. the EU-sponsored Mont Sangbé National Park (PNMS) in Western Ivory Coast also become arenas of fierce struggles over reallocation of resources and benefits, fought between uneven powers. Conservation which in terms of global philosophy hails as a generous contribution towards restoring the balance between natural resources and global (mis)use of them, may narrate as a story of expropriation, alienation, and profanation from the perspective of those confronted with it on their territory. The noble act of solidarity with coming generations becomes, in the perception of local stakeholders, a denial of their right to pass on to their own offspring vital resources inherited from their ances-

tors. The terms used by the Tura to refer to the PNMS after its first implementation (1995-2001) left no doubt that they saw in it a further interference with their titles of ownership in an unbroken tradition of intrusion since the beginning of the colonial epoch (Baya 2008).

No one would therefore have expected the local population to take the lead in the reconstruction of the PNMS following its demise after the area came under rebel control, shortly after its completion (2002-). Yet while conflicts are lingering on – the “war after the war” (Berdal 2009:53), mainly over illegal occupancy of land favoured by the war, both inside and outside the PNMS – it is this most unlikely scenario that comes to prevail. An agreement of cooperation is signed in April 2010 between the Ivorian Office of Parks and Reserves (OIPR, still waiting for disarmament to become effective before taking physical control of the PMNS and deploying its forces), the Federation of the village committees (CODIV), the Institute for language and development (IITBLD) in Man which, initiated by local partners as an extension of Volkswagen-sponsored LAGSUS research which had come to an end two years ago; and the regional direction of the National Agency of Agricultural Research (CNRA).

The purpose of my update on this constellation is to analyze its internal and external dynamics, propose reasons for the turnaround of the attitude manifested towards the park by local populations, and for the leadership role recognized to them in rebuilding the park. I will show how:

- a traumatizing and pauperizing experience (civil war) was turned into a collective learning experience which in turn had been triggered through adaptation of a research concept originally conceived for “normal”, peaceful context. Using this example, I will show how implementation benefits from research framing and at the same serves as the acid test of the latter’s relevance beyond the scientific community;
- the management at the second implementation earns massive dividends at those points where, during first implementation, it had shown respect for local institutions, local languages and democratic processes as they pre-existed to the PNMS;
- relations of co-operation between French-speaking government instances and native communities are enhanced across the language divide through a research structure (IITBLD) fully operating in a non-discriminatory bilingual mode, using bilingualism as an epistemic resource, and at the same time as a channel for mediation between potentially conflicting approaches and cultural views among the various actors and agencies.

3.1

Sustainability Transition Strategies as a Framework for Implementation

Braden Kay (paper co-authored by *Arnim Wiek*), Arizona State University, USA

Keywords: Transitions, anticipatory governance, transformative knowledge

As sustainability challenges such as climate change, poverty, and environmental degradation aggravate there is a growing focus on the need for bridging the gap between problem analysis and implementation of solutions. This aim on real world changes defines the field of transdisciplinary sustainability research. However, historically there is a heavy focus on generating analytical knowledge (and partly target knowledge) with the idea that if we only find the right data set or model that we will have reached a sufficient understanding to solve grand real-world challenges. Paradigms and their accompanying tools including mathematical modeling, life-cycle assessment, and cost-benefit analysis have thrived in this endeavor.

Yet, as pointed out in different strands of literature, there is a critical component missing, namely strong *transformation* knowledge that is based on a collective capacity for *how* change is implemented. This type of knowledge creates a bridge between analytical knowledge (where we are) and target knowledge (where we would like to be). There is a great need for a new field of research to create and implement transformation knowledge that can lead to effective implementation of sustainable solutions.

We have developed an approach using the transition framework combined with institutional theory to create, analyze and utilize transformative knowledge. Using the four key phases of a transition (pre-development, take-off, acceleration, and stabilization), the framework defines specific goals, tools, barriers, synergies, resources, coordination etc. for each transition phase. The framework allows for a systematic creation of transition strategies and guides the development of monitoring and evaluation processes. It is intended to support the practice of implementation in an iterative and reflexive procedure.

We have applied this framework in a long-term urban development project in close collaboration with the City of Phoenix, Arizona. Through a series of stakeholder engagements and a co-creation with the city government, we have developed a set of transition strategies that are currently being implemented, including energizing vibrant urban cores, mobilizing efficient transit, cultivating strong business, and creating renewable and

efficient energy. Through crafting these transition strategies we are building a common action plan with and for a variety of stakeholders across the city which fosters the implementation of pilot projects and supports long-term transitions.

This paper presents the concept of using transition strategies as an implementation tool as well as the empirical example of a transdisciplinary project that has crafted and continues to implement sustainability transition strategies in Phoenix.

3.2

The Mountain Invasion Research Network:

Bridging research and implementation on a global scale

Christoph Kueffer, Mountain Invasion Research Network (MIREN), ETH Zurich, Switzerland

Keywords: Boundary organization, global change, nature conservation, precautionary principle, preventive measures

Non-native plant invasions are a major component of global change and are considered a threat to native ecosystems and biodiversity. Mountains are one of very few ecosystems not yet severely affected by plant invasions, however, this resistance to invasions may be transient in light of ongoing global change. Prevention is widely considered the most cost-efficient management strategy against the threat of biotic invasion. In mountains researchers and managers have the unique opportunity to respond in time to an emerging threat.

The Mountain Invasion Research Network (MIREN) was therefore setup to transfer knowledge gained with lowland invasions to mountains under global change and to facilitate the implementation of prevention and management strategies against plant invasions in mountains. MIREN has over the past five years established a baseline understanding of drivers of plant invasions in mountains and reached out to conservation bodies at different levels from local National Parks, to regional networks (e.g. ALPARC in the European Alps) and global policies (e.g. Convention on Biological Diversity (CBD) or the UNESCO Biosphere Reserve program). Some of the main success factors and lessons learnt that will be discussed in this paper are:

- a) MIREN is a network of a small number of partners distributed across all continents (European Alps, Canary Islands, US Pacific Northwest, Hawaii, Chilean Andes, Australian Alps, South Africa, and Kashmir – Himalaya). This enables global learning through comparison of local case studies that integrate multiple biological and social system factors as well as research and management.

- b) For broader outreach and involvement of experts MIREN is linked to a number of large-scale networks in two separate fields of expertise – invasive species and mountain management; and it serves as a bridging organisation between these previously unconnected fields of expertise.
- c) The MIREN team is composed of both researchers and managers, as well as of both young scientists (e.g. PhD students) and leading experts in invasion biology. Objectives of the network are reviewed and adapted annually at a meeting. This flexibility is only possible thanks to bottom-up funding.
- d) A major interdisciplinary research outcome is that the relative resistance of mountains to invasions compared to lowlands may have less to do with a harsh mountain climate but more with differences in land use intensity and human movement of non-native species. Collaboration with stakeholders to minimize introduction of potentially invasive novel plants to mountains is therefore central for successful implementation.

3.3

Developing and Testing a Sustainable Tourism Growth Model for Adaptation and Mitigation to Climate Change in the Arctic of Svalbard: Balancing science, communication and practice

Tobias Luthé, University of Applied Sciences HTW Chur, Switzerland (paper co-authored by *Eric L. Berlow*, University of California Merced, Sierra Nevada Research Institute, USA)

Svalbard as part of Spitsbergen has recently received much attention due to the most obvious impacts of climate change on this fragile Arctic ecosystem less than thousand kilometres south of the North Pole. Climate change has already been leading to a loss of sea ice, which is critical habitat for the 3000 polar bears that live on Svalbard. Polar bears depend on sea ice to hunt seals that live in the fjords. Other impacts include changes in plant biodiversity. With all this attention on climate change and polar bears, tourism and international research projects have far surpassed coal mining in terms of public importance and visitor numbers for Svalbard – and could soon dominate the Svalbard economy. Tourism development in particular, while increasing local economic opportunities, threatens to impact this fragile environment. In the region around the main town of Longyearbyen tourism has increased to more than 50,000 people annually.

Snowmobile tourism has been rapidly growing and now dominates tourism activities in the winter and spring, leading to noise disturbance and pollution. There are few restrictions on snowmobile traffic in part due to the local economic power of the conventional tour operators. A local eco tourism company has been leading the path of local sustainable tourism. In large part due to their efforts, a region near Longyearbyen has recently

been closed to motorized traffic to protect the wildlife and Arctic soundscape. The company offers dog sledding trips as an eco friendly way of experiencing the Arctic, but they compete with the fast growing snow scooter business, and depend on “low impact zones” in order to offer the client a product to enjoy the tranquility of the place, watch wildlife, and get closer to a unique and threatened environment. Despite their efforts, they remain a small voice in a local economy dominated by more conventional tourism operations.

In an approach of sustainable business development, a non profit organization partnered with the dog sled company to diversify their product range of low impact activities, to increase their business, attract broader audience and proof the economic viability of sustainable tourism offers as an alternative to conventional motorized growth.

By helping to expand its offerings and increase demand for low impact ecotourism, strength and size of the voice for sustainable economic development of the island should increase, leading to policy changes in environmental governance, and serving as pull factor for the local tourism industry to follow this path. Still, when trying to market such offers reactions showed that more research is needed to underline the potential positive effects of a qualitative tourism growth model and to find acceptance with stakeholders.

Workshop 6: room: B105

Tacit Knowledge as the Missing Link –
Knowledge Transformation in the „idée suisse“ Project

Organizers: *Daniel Perrin*, *Michael Schanne*, Zurich University of Applied Sciences, Switzerland, *Aleksandra Gnach*, *Mathias Fürer*, University of Berne, Switzerland, *Marcel Burger*, University of Lausanne, Switzerland. Invited guests from European universities and practitioners.

Keywords: Integrative social theory, linguistics of newswriting, knowledge transformation, tacit knowledge, public service media

In the “idée suisse” project, we investigated how the Swiss public broadcasting company SRG should, wants to, and can contribute to mutual understanding and identity formation in Switzerland while operating between the poles of a political mandate and competitive market forces. Research questions and frameworks were developed in collaboration with actors in the life-world: media politics, media management, journalism. The project was funded by the Swiss National Science Foundation, National Research Programme 56, 2005-2009.

The overall findings show that the knowledge of how to bridge the public mandate and market forces cannot be identified in executive suites, but in newsrooms. Whereas the managers usually are frustrated by the expectations of media politics, some experienced journalists find solutions to overcome the conflict between public mandate and the market. These solutions tend to emerge when the journalists tackle complex and unexpected problems in critical situations within their daily routines (e.g. Perrin, Burger, et al., 2009).

In this presentation, we will first outline the research framework and these general findings and then detail how an experienced professional recognized a critical situation of collaborative text-picture production and overcame an apparently intractable conflict with his emergent solution. In the discussion, we will elaborate on how this “tacit knowledge” – the situated, implicit and individual strategies and procedures of certain experienced players – is made available through systemic knowledge transformation to the corporation as explicit organizational knowledge.

In a top-down approach, we implement the knowledge generated in the “idée suisse” project through advisory projects on behalf of media politics and management of, for example, European national broadcasting companies. In such projects we stimulate a shift of focus towards enabling variation, change, and success in the newsrooms. The key question is: How can media politics and media management, for example, through allocations of resources, contribute to organizational environments that foster emergent solutions in the newsrooms?

In a bottom-up approach, we implement the knowledge through training, coaching, and education of future professionals in journalism schools and practitioners in the newsrooms. Whereas the top-down approach focusses on improving organizational conditions of emergence, the bottom-up approach aims to raise awareness and extend open-mindedness and the knowledge of practical models. The toolkit applied ranges from storytelling (success stories of problem solving, based on case studies of tacit knowledge and good practice, e.g. Perrin, 2010 accepted) to guidelines for curricula in professional education (e.g. Perrin, Albrecht, et al., 2009). The presenters in the workshop who joined the international “*idée suisse*” project and steering groups will share insights into the development, applications and evaluation of their toolkits. Lessons learned for future transdisciplinary research projects in similar fields of application will then be discussed with all participants of the workshop.

Paper session 4: Tools: Curricula and Publications
room: B104 | chair: Britt Holbrook

4.1

Towards Transdisciplinarity in Higher Education – Teaching and Implementation of Courses in Engineering Ethics and Technology Assessment

Jan Schmidt, Darmstadt University of Applied Sciences, Germany

Keyword : Engineering Ethics, Technology Assessment, Pragmatism, Education, Philosophy of Interdisciplinarity

It is interesting to see that, today, the discourse on inter- and transdisciplinarity (ID/TD) is dominated by methodological issues on how to organize research projects. The aim seems to be, apparently, to develop a method “tool kit” to foster interdisciplinary integration of various disciplinary kinds of knowledge production. This discourse focuses, obviously, on means, not on ends; it concerns research, not education.

Throughout the history of interdisciplinarity, however, more emphasis was put on education (“*Bildung*”). In his thought provoking paper presented at the *Centre for Educational Research and Innovation* (CERI) in the early 1970s, Erich Jantsch addressed explicitly *education* and the university system – his influential title is well known: “Towards interdisciplinarity and transdisciplinarity in *education* and innovation” (1970/72). Jantsch advocated a concept of “education for self-renewal” (university, science, society) based on “a purposive education system” including critical thinking and a certain reflexive type of knowledge (“Know-where-to”). A couple of years later Joseph J. Kockelmans edited his programmatic volume on “Interdisciplinarity and Higher Education” (1979).

The guiding ideas and the ways of implementation of ID/TD, therefore, have always been interlaced with education – here, a pragmatist tradition (including a philosophy of education and pedagogic) is prevalent and seldom explicitly reflected. The aim of my paper is to underline the education side of ID/TD and, by this, to enter the normative discourse on goals, objectives and aims of higher education and university development. The paper is organized as follows: (1) I consider Jantsch’s classic approach in more detail and explicate his programmatic ideas of ID/TD for renewing the education system. Surprisingly it turns out that his ideas are rooted, as I will show, in the tradition of pragmatism *and* of critical-/discourse-theory. (2) Based on my (re-) reading of Jantsch, I reconstruct the history of ID/TD from the perspective of education. I explicate the tension education vs. research, and argue for the priority of education. (3) In order to underline the relevance of education for understanding, conceptualizing and implementing ID/TD, I present two case studies of interdisciplinary courses (Engineering Ethics and Science/Technology Assessment) taught and implemented at Georgia Tech, Atlanta/USA, and at Darmstadt University of Applied Sciences, Germany. Here, I show that a “big”, reflexive, problem-oriented type of ID/TD is involved, which differs from those types in bioinformatics, nanoscience, or econophysics. (4) The paper concludes that inter- and transdisciplinarity should be regarded as (participatory) *education processes*. Even (inter- and transdisciplinary) research projects are best understood as education processes – for scientists, for lay people, for decision makers and, thus, for the whole society.

4.2

Dedisciplining Philosophy

Robert Frodeman, University of North Texas, USA

Keywords: philosophy, philosophy of interdisciplinarity

Now well into the 21st century, the philosophic community is beginning to revisit questions that have been set aside since the end of the 19th. As was the case 120 years ago, this is mostly the result of external pressure. The pressure takes two forms. Scientific and technological innovations are raising new ethical and metaphysical questions. At the same time, society is demanding greater accountability from the academy. These (still quite incipient) changes can be gathered under the heading of the interdisciplining of philosophy.

But if we wish to ‘interdiscipline’ philosophy we will first need to see that it is dedisciplined. Within the US at least, the philosophical community reached consensus by 1900: philosophy as going to be a discipline. Standards of performance were set and evaluated by a self-enclosed community of peers. The goals of research followed what Kuhn called “puzzle

solving”: assuming the institutional ontology and epistemological bonafides of the academy, philosophers sought to work out the basic structures of language, science, and ethics. Doubtless, rigorous work was produced; but the results were also tacitly dogmatic, in that they simply accepted the norms of disciplinary knowledge that characterized the special sciences.

There are signs that 20th century disciplinary excess is breeding a counter-movement toward inter- and transdisciplinarity. This movement is discernable both within and outside the academy, but it is still half-conscious, halting, and subject to backtracking. Despite constant invocations of the need for interdisciplinarity, disciplinary assumptions still dominate the structure of the academy. The philosophic community has been notably laggard here: in a time calling for bold interdisciplinary experimentation the field remains more disciplined than most, and is characterized by the dreary repetition of the puzzle solving mentality. It is clear that the impetus for change within philosophy will come from outside philosophy.

This talk will discuss the development of a new model of philosophic reflection currently being pursued at the University of North Texas.

4.3

Bringing Results to Fruition through Publication?

An analysis of a peer-reviewed, open access and context-focused journal's editorial practice

Anne B. Zimmermann, Susanne Wymann von Dach, Theodore Wachs, and Hans Hurni, University of Bern, Switzerland

Keywords: Peer review system; dissemination; transdisciplinary journals; science-society gap; North-South divide

When it comes to helping to shape sustainable development, research is most useful when it bridges the science–implementation/management gap and when it brings development specialists and researchers into a dialogue (Hurni et al. 2004); can a peer-reviewed journal contribute to this aim? In the classical system for validation and dissemination of scientific knowledge, journals focus on knowledge exchange within the academic community and do not specifically address a ‘life-world audience’. Within a North-South context, another knowledge divide is added: the peer review process excludes a large proportion of scientists from the South from participating in the production of scientific knowledge (Karlsson et al. 2007). *Mountain Research and Development* (MRD) is a journal whose mission is based on an editorial strategy to build the bridge between research and development and ensure that authors from the global South have access to knowledge production, ultimately with a view to supporting sustainable development in mountains. In doing so, MRD faces a number of challenges that we would like to discuss with the td-net com-

munity, after having presented our experience and strategy as editors of this journal.

MRD was launched in 1981 by mountain researchers who wanted mountains to be included in the 1992 Rio process. In the late 1990s, MRD realized that the journal needed to go beyond addressing only the scientific community. It therefore launched a new section addressing a broader audience in 2000, with the aim of disseminating insights into, and recommendations for, the implementation of sustainable development in mountains. In 2006, we conducted a survey among MRD's authors, reviewers, and readers (Wymann et al. 2007): respondents confirmed that MRD had succeeded in bridging the gap between research and development. But we realized that MRD could become an even more efficient tool for sustainability if development knowledge were validated: in 2009, we began submitting 'development' papers ('transformation knowledge') to external peer review of a kind different from the scientific-only peer review (for 'systems knowledge'). At the same time, the journal became open access in order to increase the permeability between science and society, and ensure greater access for readers and authors in the South. We are currently rethinking our review process for development papers, with a view to creating more space for communication between science and society, and enhancing the co-production of knowledge (Roux 2008). Hopefully, these efforts will also contribute to the urgent debate on the 'publication culture' needed in transdisciplinary research (Kueffer et al. 2007).

Paper session 5: Education and urban Planning for Public Health
room: B108 | chair: Barbara Smetschka

5.1

A Significant Sustainability Question:

Increase the number of health treatments or increase public health?

Willi Haas (Co-author: Ulli Weisz), Institute of Social Ecology, iff-Klagenfurt University, Vienna, Austria

Keywords: health, sustainable development, health promotion, quality management

It is paradox that while the health care sector is aiming at treating health problems at the same time it is significantly contributing to pressures on the environment, which in turn consequently threaten human health. First assessments show a 4-8%¹ share in GHG pollutions of the health sector including its up-stream effects in developed countries. Additionally costs for the health care sector are constantly increasing relative to the GDP and such are increasingly overstressing the capability of national finances. Furthermore the health sector is one of the most straining workplace set-

1 This wide range is due to huge data uncertainties.

tings. Altogether this can be understood as an unsustainable dynamic in developed countries caused by manifold interwoven reasons: aging societies, ever increasing medical-technical progress making more and more health problems curable, a shift from acute to chronic diseases, more and more complex clinical pictures, etc.

No surprise that green hospital initiatives can only achieve improvements to a certain limit but are falling short of addressing these problems. Despite considerable progress in lowering energy demand for heating and energy efficiency increases in all areas total electricity demand is constantly increasing due to more air conditioning, more energy consuming equipment and more treatments. Additionally up-stream effects are increasing as well.

All this calls for an approach that goes beyond treating symptoms in the health care sector. The concept developed and tested in a hospital departs from a global sustainability understanding. At the core global concepts aim at understanding side and long-term effects of action comprehensively to improve steering capacity for avoiding problem shifting to nature. At hospital level problem shifting occurs to the physical environment via direct and indirect pollution, to the social environment e.g. via overstressing employees or via burdening public finances.

The implementation of such a sustainability approach is highly compatible with hospital's quality management. It cares about outcome quality. However, the concept of outcome quality can be expanded to include in addition to clinical outcome side and long-term effects in all three dimensions of sustainability at the same time. Such hospital development becomes an optimization problem.

Next to the quality management the sustainability approach is highly synergistic with health promotion. The more health gain can be generated by health promotion (e.g. physical exercise, nutrition, stress reduction) the less treatment is necessary. While health treatment especially in hospitals is material and energy intensive including financial and social problems health promotion can have significant co-benefits for the economic, social and ecological dimensions of sustainability.

5.2

A Curriculum in Transdisciplinary Public Health

Timothy D. McBride and Debra Haire-Joshu, Washington University in St. Louis, USA

Keywords: Public health, transdisciplinary problem-solving

Federal agencies in the U.S. (e.g., The National Institutes of Health) are major promoters of the transdisciplinary approach to public health for the study of the social determinants of health, involving communities in inter-

vention research, promoting development that benefits health and the environment, and integrating science and policy to develop best public health practices. This paper presents the outline of how transdisciplinary research and practice in public health can be developed as the cornerstone of a curriculum in public health. Traditional educational methods have favoured unidisciplinary approaches (e.g., epidemiology, behavioural science, economics) that teach students to focus on the individual pieces of the puzzle that define population health, leading to scientific silos which can limit knowledge and understanding of the complex systems that impact population health. In contrast, transdisciplinary methods require an understanding of interaction of the biological, behavioural, social, and public health sciences; shared disciplinary frameworks in analyzing health problems; and the integration and evaluation of transdisciplinary solutions to complex public health problems. A transdisciplinary problem-solving approach to promote public health competency develops a comprehensive understanding of (i) the interaction of the biological, behavioral, social, and public health sciences; (ii) shared disciplinary frameworks in analyzing health problems; and (iii) the integration and evaluation of transdisciplinary solutions to complex public health problems (Sallis et al. 2000; Stokols et al., 2008). Using the case study of a newly-developed Master of Public Health (MPH) program at Washington University in St. Louis focused on transdisciplinary public health, this paper will present and explore the model developed in this curriculum. Using case studies from the classroom of the transdisciplinary problem-solving approach the authors present an outline of how the transdisciplinary problem-solving approach is applied in the curriculum using a participatory, experiential, and active team-based learning approach, focusing on real-world and timely public health issues or problems. The findings suggest that it is quite possible to develop a curriculum developed around the ideas of transdisciplinary public health, even within the standard public health curriculum model, especially with due diligence to the competencies the students will obtain. Students are very receptive to learning through this model, and employers appear eager to entertain hiring students with these special skills. Challenges to developing the curriculum include the initial start-up costs of thinking through developing the curriculum, the resource-intensity of the curriculum approach, and the challenge of finding instructors able to adapt their teaching methods to a transdisciplinary problem-solving approach.

5.3

From Research to Policy and Practice:

Using operational measures of the built environment for health

Anne Vernez Moudon, University of Washington, USA

Keywords: Built environment, health, measurement

Research on how the built environment may affect health is developing rapidly. This research is based on evidence that lifestyles influence health status, and that this influence is also mediated or modified by the characteristics of the environment where people live, work, and play. To be effective, the results of such research need to be ‘operationalized’ and translated into both health and urban design and planning policies and practices. For example, health professionals need to understand what environmental ‘prompts’ would foster increases in active living in order to calibrate their interventions based on the characteristics of the environment where their target population lives. Urban designers and planners need to devise regulations insuring that such „prompts“ are present near where populations concentrate.

The paper attempts to advance policy- and practice-relevant research designs by presenting approaches to the measurement and representation of the built environment that are readily understandable by or familiar to both public health and urban planning professionals. These approaches have been tested in previous projects examining the independent effects of the built environment on physical activity and walking. In a first step, we select variables that correspond to discrete attributes of the environment such as the presence of routine destination places (e.g., parks, grocery stores, schools) and the distances that separate places of interest. Measuring the tangible aspects of the built environment insures that health professionals can apply research results to actual places where active living takes place, and that urban planners can integrate them into policies and regulations. This measurement approach is in contrast to the many research designs that use multi-variable indices or factors (e.g., for describing land use mix, vegetation types, etc.) to synthesize the interactive nature of multiple built environment characteristics. While the use of discrete variables complicates statistical analyses, it is essential to insure the application of research results to common practice.

In a second step, we develop “smart maps” to measure the distribution of the discrete attributes of the built environment in space. Processed in geographic information systems (GIS), these maps are data layers that serve two purposes: (1) to help public health and planning professionals visualize the spatial dimension of selected attributes of the built environment; (2) to provide spatially continuous measures of the built environment attributes of interest. Smart maps can capture the spatial distribution of many built elements and land uses, including residential units, parks, grocery stores, streets, traffic volumes, etc.

6.1

Implementing Interdisciplinary Practices: Lessons from UK Research Programmes

Catherine Lyall, ESRC Innogen Centre, The University of Edinburgh. Co-authors: *Ann Bruce*, *Wendy Marsden* (ESRC Innogen Centre) and *Laura Meagher*, Technology Development Group, Fife, Scotland

Keywords: organisational learning; interdisciplinarity; global environmental change; earth systems science

There is increasing emphasis on interdisciplinary research in order to tackle some of the world's most pressing environmental problems. In the UK, we are witnessing a significant increase in public funding for strategic interdisciplinary programmes but the lessons arising from such initiatives can be hard to capture and codify.

This paper presents and critically discusses the effectiveness of large research initiatives designed to encourage interdisciplinarity and community building in the context of global environmental change. Key objectives of our study are to promote organisational learning and generate benefits that are applicable to future efforts to tackle complex, multidimensional challenges that require the integration of theory and practice.

The focus is thus on learning about practical experiences with interdisciplinarity and implementation and on assessing what organisational opportunities are provided by programme directors to stimulate interdisciplinary collaborations among natural scientists, between natural and social scientists, and between researchers funded by such programmes and potential users of the research (in particular, the policy community).

We will highlight some of the achievements and challenges faced in meeting such programmes' ambitious interdisciplinary goals. Programmes' communication structures, reward and promotions systems, leadership, coordination of scientists, and research evaluation practices underpinning research-funding decisions, may be considered from the perspective of interdisciplinary and implementation science. The paper will consider how knowledge produced in the context of complex environmental problems requires boundary crossing between the sciences and between researchers and research users: how is this process organised?

By taking an in-depth look at QUEST (Quantifying and Understanding the Earth SysTem), which is one of the UK's flagship research programmes for Earth System Science, in conjunction with comparable interdisciplinary initiatives, in the UK and abroad, this research adopts a multiple methods approach, exploring and evaluating ways to support and expand the UK's diverse and active community of earth system scientists and

provide insights about the kinds of enabling organisational infrastructure that supports collaboration, information-sharing and implementation. The empirical research is structured around three case studies and the outcomes from this research will: suggest practical enhancements to implement new modes of interdisciplinary working; facilitate opportunities for the UK research community in earth systems science to continue its collaborative working in future; and contribute to future government research investments by providing valuable organisational learning and transferable lessons to the funders who frame, assess and manage interdisciplinary initiatives and the researchers and other stakeholders who lead, conduct and generate impacts from them.

6.2

Implementing Successful Interdisciplinary Research Programmes in Agriculture

Anna Crole-Rees, Crole-Rees Consultants, Switzerland

Keywords: Agricultural research, design and implementation, institutional integration, change management

Most if not all agricultural research and development projects in Northern and Southern countries are required to work with an interdisciplinary approach. The experience interdisciplinary approaches of the last few decades have been disappointing in terms of research results and of impacts on agriculture. A well-known example is farming-system research. The cost of failing is very high in terms of credibility, motivation and most important, in terms of lack of development in agriculture and rural areas. Inter- and transdisciplinary research have been ample defined and explained. The relevance of adequate innovation systems has also been described. The barriers to interdisciplinary work have also been analysed, mainly at programme and/or team level.

This paper aims to review the factors that have been undermining the formal introduction of interdisciplinarity in agricultural research and to suggest some practical recommendations for successfully designing and implementing interdisciplinary agricultural programmes. It first reviews the literature about the various barriers to interdisciplinary work in agriculture. Those are mainly at programme and/or team level, namely at the interdisciplinary research system. They are: the value-laden nature of science, the different perceptions and use of the various concepts, great distance, different cultures and integration models, etc. The integration of the new approach, the interdisciplinary research, in the actual system has been less analysed. This raises the risk of failure in implementing interdisciplinarity. The factors are various. The first is that agriculture is generally perceived

as an interdisciplinary field of research *per se*. Consequently, investments required when designing, planning and implementing the new approach are underestimated as the approach is not perceived as being novel. Resistance to changes might also be higher than expected. The implications of interdisciplinarity are not perceived at the actual level. The second is that accent is often put on the new type of programmes and less on its integration into the current system and the current work programme that generally remain within the specific institution. The differentiation characteristics between both systems as well as the potential linkages in terms of organisation, resources, communication, etc. are less taken into account.

The paper concludes with specific recommendations for decision-makers and programme leaders for successfully designing, formulating and implementing interdisciplinary research programmes.

6.3

Partnership Actions for Mitigating Syndromes (PAMS): Experience with a transdisciplinary tool in the NCCR North-South programme
Eva Maria Heim, Claudia Michel, Anne Zimmermann, Thomas Brey, Peter Messerli, Karl Herweg, and Annika Salmi, Centre for Development and Environment, University of Bern, Switzerland

Keywords: Partnership actions, research for sustainable development, outcome monitoring, researcher's role, North-South

Partnership Actions for Mitigating Syndromes (PAMS) are small transdisciplinary projects which bring scientific research insights from the NCCR North-South into policy and practice. They are implemented by researchers from different disciplines in collaboration with non-scientific actors. PAMS aim to implement and test approaches, methods and tools developed in research, in order to identify promising strategies and potentials for sustainable development. In this sense, they are solution-oriented.

This paper will provide insights into our experience with PAMS, with a special focus on the implementation of transdisciplinarity and its outcomes. From 2001 to 2010, 77 PAMS were implemented in Africa, Asia and Latin America. An internal evaluation of the first 55 projects was conducted in 2006. Results of this evaluation led to a refinement and improvement of the tool. A second internal evaluation is currently underway in the NCCR North-South. This evaluation will provide an overview of 22 new PAMS. We will look at partners involved, project beneficiaries, activities implemented, outcomes achieved, and lessons learnt.

In the first evaluation, transdisciplinarity was considered as “a form of collaboration within scientific fields [...] and as a form of continuous dialogue between research and society” (Messerli et al., 2007). The evaluation report concluded that this understanding of transdisciplinarity was not

satisfactorily applied in the 55 projects. Only about half of the PAMS addressed mutual exchange between researchers and society. Some involved only one specific field of research and clearly lacked interdisciplinary cooperation, and most often knowledge was transferred mainly unilaterally from the scientific community to society, without society having any effect on science. It was therefore recommended to address transdisciplinarity more carefully in Phase 2 PAMS.

The second evaluation, which is currently under way, is analysing whether and how this recommendation has been met, based on criteria defined in the NCCR North-South's Outcome Monitoring Strategy. The analysis is focusing on partners with whom researchers interact and investigating whether practices have changed both in research and society. We are also exploring the role of researchers in PAMS. Preliminary results show that researchers can assume different roles, from direct implementation, mediation, and promotion of social learning between different actors, to giving advice as neutral outsiders.

Workshop 7: room: B105 | chair: Roderick Lawrence

Urban Futures

Input: *Merritt Polk*; University of Gothenburg

Discussants: *Carole Després*, University of Laval; *Malin Mobjörk*, Swedish Defence Research Agency; *Christian Pohl*, td-net

Keywords: Leadership, social networks, participation, education & learning

Since January 2010, Chalmers University of Technology along with a consortium (including the City of Gothenburg, Västra Götalands Region, the County Administration Board, the Region Association of Local Authorities, the University of Göteborg and (IVL) the Swedish Environmental Research Institute) are hosting Mistra Urban Futures, an international centre of excellence for sustainable urban development. The centre is funded by the Swedish Foundation for Strategic Environmental Research (MISTRA) and the Swedish International Development Cooperation Agency (SIDA).

The centre follows a transdisciplinary approach that combines research and urban development and that makes practitioners and researchers work closely together. Five pilot projects are being started in 2010 at the Gothenburg Interaction Platform. These include: (a) Multi-level governance for sustainable urban development; (b) Building for climate change; (c) Urban empowerment; (d) Business-driven sustainable development and (e) Urban games: mutual learning for sustainable development. The centre will also take part in an international network of Interaction Platforms that, besides Gothenburg, includes Manchester, Shanghai, Cape Town, and Kisumu in Kenya.

The centre is in an early stage of development. The proposed workshop serves to constructively review and further develop the centers methodological approach to bridging research and practice. A central topic is how to design transdisciplinary processes for joint knowledge production that support participation, collaboration, and integration between and among researchers and practitioners in the urban knowledge area. Some possible questions include:

- What are the types and degrees of collaboration that are most applicable at the different stages in the knowledge production process?
- How can the integration of the different parts of the knowledge producing process (such as problem formulations, values, worldviews, methods, different knowledge types, results and strategies for implementation) best be supported in practice?
- How should processes and methods that promote transdisciplinary work be designed and managed?

- What types of assessment can adequately grasp the multiple goals of a transdisciplinary approach?

The centre’s coordinator for developing the transdisciplinary methodology (M. Polk) will present the work that is ongoing at the center and some of the main challenges that have been experienced in the process thus far. The participants will respond to both the presentation and the questions listed above.

Paper session 7: Social Learning
room: B104 | chair:Theres Paulsen

7.1 cancelled

Didactics of Societal Learning. A suggestion for a theoretical frame for transdisciplinary implementation

Richard Beecroft, Hochschule Darmstadt, Germany

Keywords: Technology Assessment, Didactics, Societal Learning, Education, Methodology

In this contribution, the implementation of transdisciplinary research will be analysed theoretically, focussing on the field of “technology assessment”. This field is often considered as a prime example of “societal learning processes” both from an outside analytical perspective (e.g. Zweck 1993) and within the methodological discourse itself (Grunwald Schmidt 2002).

The starting point of the contribution is the thesis that “societal learning” is not just an adequate description of transdisciplinary research in general, but that it is the main aim of transdisciplinary research. Hence, the question of implementation is foremost a question of implementing societal learning processes. If this implementation is not just handled pragmatically according to the situation, but instead planned, monitored and reflected, this constitutes necessarily a didactical perspective on implementation. To support the implementation adequately, this didactical perspective needs a theoretical foundation, which can be based on existing didactical theories and their critical reflection in educational sciences (Gruschka), but which has to widen the scope of educational setting considerably and therefore needs alterations.

This idea will be illustrated using two typical but very different TA-concepts, rational TA and constructive TA. The relevant actors in these concepts and their role in the „societal learning process“ will be compared, to show the analytical quality of a “Didactics of Societal Learning”-approach.

As an outlook, different possibilities to interlink societal learning processes with other educational settings for transdisciplinary implementation will be discussed, such as higher education and professional ‘training on the job’.

7.2

Environmental Sciences: A playground for interdisciplinary issues?

*Pauline Plagnat and Hy Dao, Institute of Environmental Sciences (MER),
University of Geneva*

Keywords: environmental sciences, integrated education

In recent decades, the necessity to take care of our environment has imposed itself as a strong priority. However, if addressing environmental concerns is essential for sustaining human living conditions on earth, industrialised countries have been dragging their feet in policy making and the implementation of concrete environmental measures. Many governments in these countries have not realised the urgency of mitigating the consequences of their ways of life, by the implementation of adaptive policies. This inertia has some of its origins in the lack of interest for human sciences. Most scientific contributions on this subject derive from bio-physical environmental sciences to understand the changes and impacts in the bio-physical environment. Nevertheless, analyses of the behaviour and organisation of human societies are also needed to address the situation with political tools. Therefore, at the very least, multidisciplinary is required to address this complex issue in its globality. However, the different epistemologies – of each discipline and science (in both the natural and human sciences) raise difficulties for collaboration, preventing strong interdisciplinarity, especially when treated within traditional disciplinary scientific methodological frameworks. The practical solution will lie in the capacity of teams of researchers to join their research objectives by building dialogue. However, if the need for interdisciplinary approaches is no longer questioned, interdisciplinary scientific methods are not yet defined precisely enough to build a consensus of this kind of scientific contribution. This lack of criteria comes from shortcomings in education in the domain, as well as a lack of academic acceptability. New courses of study and ways to build knowledge have been implemented during the last decade. These courses apply innovative approaches and methodologies that can bridge the gap between disciplines and also question the subject of study in an integrative way. These educative methods are becoming the focus of an international debate. Is a pluri/multi-disciplinary education enough to produce interdisciplinary knowledge, or should the educators and researchers themselves be formally trained to deliver an integrated education? How can the first generation of strong interdisciplinary researchers be trained using pluri/multi-disciplinary methods? This paper will examine the case of the MUSE (Master of Environmental Sciences) which was implemented in 2007 at the Institute of Environmental Sciences, University of Geneva, Switzerland.

7.3

Transdisciplinarity Perspectives in Romania

Magda Stavinschi, Institute for Transdisciplinary Studies in Science, Spirituality, Society (IT4S), Romania

Keywords: Methodology of Basarab Nicolescu, social change, science and religion

By definition, transdisciplinarity connotes a research strategy that crosses many disciplinary boundaries to create a unified approach. In Romania it has an increasing practical aspect also, the starting point being represented by the dialogue between science and religion initiated in 2001. Since then this dialogue has been growing to the extent that we might say that transdisciplinarity becomes a subject for the educational system at all levels. The introduction of transdisciplinarity as a methodology in the new draft on education law, including the final exam of baccalaureate, is the best evidence. But there is another important aspect to take into consideration: Scientific experiments addressed to kindergarten or school children up to academics proves that time for change has come; there is a clear need for transdisciplinarity in a world with more than 8000 disciplines. So far, our experience in Romania in the area of transdisciplinarity research led to the foundation of the Institute for Transdisciplinarity.

Studies in Science, Spirituality, and Society (IT4S) under the direct leadership of the most important promoter of the transdisciplinarity today, Basarab Nicolescu, a major advocate of the transdisciplinary reconciliation between Science and the Humanities. The paper proposes some comments on the usefulness and perspectives of this methodology for today's society.

Paper session 8: Skills and Education for Sustainability
room: B108 | chair: Karen Fortuin

8.1

Integrating Campus Management into Education for Sustainability

Rob Dyball, ANU Fenner School of Environment and Society

Keywords: Sustainability, teaching, international cooperations

The Fenner School of Environment and Society at the Australian National University houses the Human Ecology Program. The Human Ecology Program was founded in 1972 by Professor Stephen Boyden, and has a long history in interdisciplinary approaches to teaching and research into the kinds of “wicked problems” that are typical of issues in sustainability. This paper briefly reviews some of the key approaches to teaching and learning that the program has developed over its many years of existence. The paper then goes on to outline more recent attempts to integrate these approaches towards education for sustainability across the campus and with international partner institutions through various alliances.

A particularly fruitful innovation has been to enable mechanisms for students of sustainability science to engage in practical programs run by the University's Facilities and Services. By extending the holistic approach to sustainability to bridge the University's campus operations with its education and research a number of very successful outcomes have been achieved. This has included setting students practical assignments that have been implemented in practice; ensuring community awareness and involvement is built into education programs; identifying pragmatic barriers to change faced by managers, and mechanisms to overcome those barriers and finding opportunities for integration such as collaboration on teaching, publications and research projects.

In sum, by using the campus as a classroom the traditional segregation of academic and operational activities of the University have been broken down and mutually beneficial outcomes for students, academics and facilities managers have been achieved. The outcome has been to develop environmentally sustainable behaviour as a common goal of the campus community and to use this as research and learning material in an ongoing spiral of learning and implementation.

The paper will conclude with some discussion of initiatives now underway to extend this approach internationally through various international partners.

8.2

Cognitive Skills in Inter- and Transdisciplinary Projects.

What can be the role of education in environmental systems analysis?

Karen PJ Fortuin, Environmental Systems Analysis Group, Wageningen University, (paper co-authored by *CSA (Kris) van Koppen*, Environmental Policy Group, Wageningen University), The Netherlands

Keywords: Cognitive skills, environmental systems analysis

Leading or doing interdisciplinary and transdisciplinary projects requires specific competencies of the people involved. These competencies are often referred to by overarching phrases as transboundary competence, boundary crossing skills or interdisciplinary thinking. The challenge to train these competences is faced by many graduate programmes. Over the past thirty years most of the attention has been paid to a group of sub-skills related to communication and team work. Obviously these skills are valuable, especially in inter- and transdisciplinary projects, but equally important are the cognitive skills. These skills relate to the ability to appropriately scope the issue or problem under study and to integrate knowledge from various scientific disciplines in order to achieve a cognitive advancement. How to teach and improve such cognitive skills are addressed in this paper. More specifically this paper concentrates on the skills that can be

improved by education in environmental systems analysis.

A systems approach is often put forward as a promising way to deal with complex issues. The strength of this approach is that it aims at conceptualizing the dynamic behavior of a system as a “whole”. In providing such a holistic approach, a systems approach is well suited for scoping a problem and integrating knowledge. Environmental systems analysis can be seen as the application of systems approaches to the domain of environmental problems. It is a scientific field that aims to develop and apply integrative tools, techniques and methodologies to better understand problems resulting from the complex interactive dynamics of environmental and socio-economic processes, as well as to develop sustainable solutions for these problems.

The paper explores characteristic cognitive skills that can be enhanced by education in environmental systems analysis, on the basis of literature and empirical experiences in course education. It identifies potentials and limitations of university level environmental systems analysis education as well as elements of this education that can improve these skills. A major finding of the study is that the way system models are conceptually used strongly depends on the sort of processes modelled in the system. Environmental systems models range over a continuum from ,hard‘ biophysical systems, where variables and functions are precisely defined, to ,soft‘ systems incorporating social and political dynamics, where variables and functions have plural and contested meanings. The challenge in education is to help students navigate across this continuum.

8.3

The Positive Spin of Covering-Up Failed Transdisciplinary Implementation

Willi Haas and Barbara Smetschka, Institute of Social Ecology Vienna, Austria

Transdisciplinary researchers know how much effort it costs to accomplish adequate problem framing, overall integration and the consequent implementation of new ideas and results with stamina. The temptation to circumnavigate the overstretching demands of transdisciplinarity is understandable. Our aim is anything but a plea to strive for ‘ideal’ transdisciplinarity, since this just increases the probability to strand. The presented approach rather suggests focusing on the questions of how much transdisciplinarity is feasible and how to pro-actively spotlight on crucial integration activities. Our experience with transdisciplinary research teams and student groups shows that this requires reflective capacities and competencies in self-observation.

A way to sharpen self-observation is to disclose ways of pretending

integration. The following list offers a selection of most popular ways we could (self)observe in concluding chapters of td-texts:

- Bridging gaps between paragraphs independent in substance by smoothly phrased connections
- One-person last-minute tour de force to wrap up td-projects by smart thoughts that point out single aspects from comprehensive but isolated parts
- Smooth narratives covering different subjects but not based in disciplines (missing theory and methods)
- The use of (scientific) bridging concepts by only cursorily touching disciplines or their subjects

Our approach aims at enabling groups in detecting these popular strategies in their own research practices and to develop more reflective ways. However, since pretending integration has the function to protect teams from overstressing demands inherent in transdisciplinarity an alternative way of protecting teams is required. Our assumption is that the replacement of an integration dogma by a pragmatic focus on a few crucial integration aspects can accomplish this function. One supportive instrument to identify most crucial integration activities is to position the team vis-à-vis the research question and to reflect on this constellation. Another one is to arrange reflective meetings to assess quality of crucial integration efforts. In this context it can be useful to discuss the key messages with scientific communities and practice partners, questioning whether they are compatible to both worlds and novel – and if this has been achieved by the added value of transdisciplinarity.

If such crucial integration can be achieved there is no need to cover-up weak integration in other areas for the sake of overall success.

Workshop 8: room: B105

How Swiss National Research Programmes Bridge Research and Implementation

Organizers: *Beat Butz*, Swiss National Science Foundation (SNF) and *Christian Pohl*, td-net, Switzerland

Inputs: *Astrid Stuckelberger*, University of Geneva, Switzerland; implementation officer NRP 32 - Ageing; *Patricia Fry*, Wissensmanagement Umwelt GmbH Zürich, Switzerland, implementation officer NRP 61 - Sustainable water management;

Since the 1970s the Swiss National Science Foundation supports targeted research by so called National Research Programs (NRP). The topics that might be selected for such programs should address urgent problems of national significance and are proposed in an open call by the scientific community. The proposed topics are reviewed and prioritized by governmental agencies. One to three a year are picked up by the Federal Council and further developed to research programs. NRPs are funded with CHF 5 to 20 million and usually last from 4 to 5 years. Current NRPs are addressing issues like sustainable water management (NRP 61), benefits and risks of the deliberate release of genetically modified plants (NRP 59) or religions, the state and society (NRP 58).

NRPs are SNF's most outcome driven research programs in terms of concrete societal problem solving. NRPs are solution-, outcome- and communication-oriented and require inter- and transdisciplinary research (SNF 2006).

A number of years ago the job of implementation officer/head of knowledge transfer of an NRP was created. The workshop aims at comparing NRPs in order to learn how implementation was approached and whether it is and was successful or not. The NRP's approach to implementation will be presented by the responsible implementation officers or researches involved in the NRP.

For further information on these programmes, see:

- Swiss National Science Foundation (2006). *The National Research Programmes NRP – Research for you: Science in the Service of Society, Politics, and the Economy*, Berne.
- <http://www.snf.ch/E/targetedresearch/researchprogrammes/Pages/default.aspx>

9.1

Dealing with South Africa's Municipal Water Service Delivery Problems: From transdisciplinary research to policy and action

Johann Tempelhoff CuDyWat, North-West University South Africa

Municipal service delivery is currently a major crisis in South Africa's governance structures. Since 2004 there has been an increasing spiral of urban protests actions. It reached a climax in 2009 when a record number of protests were registered in many parts of South Africa as irate residents, especially of the former African townships, took to the streets in protesting against what they considered as being inferior municipal service delivery.

Apart from housing, electricity, and municipal rates and taxes, there is also a significant demand for proper potable water supply and sanitation services.

Members of the Research Niche for the Cultural Dynamics of Water (CuDyWat) at North-West University have conducted several water-related transdisciplinary research projects in recent years, dealing primarily with water. It has been found that as much as 60 % of residents' discontent can be related to water issues.

Despite the reports and their comprehensive recommendations there have been little responses to what the researchers have tried to make the authorities aware of. Only in one instance did a local authority's officials effectively use a report in an effort to address some of the intricate problems prevailing in the local water sector.

In the paper a brief attempt will be made to outline some of the complexities in dealing with water service delivery in parts of South Africa. By sharing some of the problems with fellow researchers, it is hoped that a discussion could ensue in which researchers from other parts of the world can share some of their views on the matter.

9.2

Environmental Sanitation Planning in Peri-Urban Ger Areas: A case study of Darkhan, Mongolia

Katja Sigel, Helmholtz Centre for Environmental Research, Leipzig, Germany
Keywords: Sanitation planning, peri-urban, case study, participation

Though the policy and legislative framework on water supply and sanitation in Mongolia is in place, their implementation and enforcement has so far not been accomplished. Actual data suggest that the Millennium Development Goals for both water supply and sanitation may not be met

(UNICEF & UNDP 2008). The lack of adequate water supply and sanitation is not only a major issue in Mongolia: The underprovision of these services is a common problem in many urban and peri-urban areas in the developing world.

In the international scientific literature it has been widely acknowledged that there is a need for new paradigms and approaches in water supply and sanitation *planning* (Mara & Alababaster 2008). Key issues raised are (i) placing the households and its neighbourhood at the core of the planning process, (ii) responding directly to users' needs and demands and (iii) emphasising the participation of all stakeholders. All these issues are addressed by the Household-Centred Environmental Sanitation (HCES) approach developed by the Environmental Sanitation Working Group of the Water Supply and Sanitation Collaborative Council (Eawag 2005).

Based on the conceptual framework of the HCES approach a household survey has been conducted in a peri-urban ger area in Darkhan, the second largest city of Mongolia (Sigel in press). Ger areas are informal settlements on the outskirts of cities where basic infrastructure services are poor or non-existent. A total number of 139 households were interviewed in September 2009 about their current environmental sanitation practices, perceptions of existing sanitation conditions, expenditures and their attitudes about and demand for improved environmental sanitation services.

The results of the household survey and related research are highlighted against the background of the HCES planning approach for environmental sanitation. Concrete ideas for how the HCES approach will be tested in the project area study in the next years are presented. A special focus is put on the challenges with regard to the implementation of research results like (i) enabling environments and governance, (ii) ensuring effective participation and (iii) building of demonstration units. This will be done including the practical experiences and lessons learnt from other HCES case studies conducted in different urban and peri-urban sites across Africa, Asia and Latin America as it is described by Lüthi et al. (2009).

9.3

Real-World Learning Experiences to Build Implementation Capacity in Sustainability Problem-Solving

Katja Brundiers and Charles Redman, School of Sustainability, Arizona State University

Keywords: Real-world learning experiences, transformative research, sustainability

The School of Sustainability at Arizona State University has developed an inter- and transdisciplinary teaching program for real-world learning and transformative research on a variety of sustainability issues including water, food systems, climate change, and urban development. The goal is

to build capacity among students for implementation of sustainability research results in the real-world. Five areas are key to guide capacity building for implementation, namely systems-thinking, anticipatory, normative, strategic, and interpersonal competencies. The program builds partnerships between faculty, students, and practitioners who collaboratively work on sustainability issues. Each project is supported by a so-called “Transdisciplinary Interface Manager” who helps identify and design the real-world projects and who facilitates interactions among project participants. The program employs a progressive learning model that spans from analyzing real-world sustainability problems to developing possible solutions that ultimately support changes in the real-world. The model incorporates and exposes students to real-world problems and solutions in undergraduate and graduate courses. It successively expands students’ responsibility, scope, and intensity of interaction with practitioners, moving from one-way communication and one-time interactions to collaborative partnerships. The program includes scholarships for faculty to identify potential community partners in their pertinent research and teaching areas and to realize such implementation-oriented teaching projects. Currently, we are in the process of developing an evaluative framework to measure to what extent students actually build capacity for implementation in our program.

In this paper, we present the philosophy of the program, compare it to similar programs around the world, and illustrate it with two empirical examples. The first example presents a partnership with the Arizona Department of Water Resources within the undergraduate class “Policy and Governance in Sustainable Systems”. The second example presents a project where graduate students collaborated with farmers, policy advisors, and water managers to co-construct “Future Scenarios for Agriculture and Water in Arizona” challenging dominant assumptions about future developments and deriving of solutions for competing water needs in a desert environment.

10.1

The Impact of Terminological Instability on the Efficacy of Project Implementation

Robert Jay Glickman, University of Toronto, Canada

Keywords: communication; knowledge continuum; knowledge transfer

The last one hundred years have seen an extraordinarily rapid growth in the number of distinct national and international scholarly communities that exist, the theoretical approaches that are created, the specialized research projects that are undertaken, the empirical outcomes that are publicized, and the cases of interdisciplinarity that come about between academics and the public and private organizations that interact with them.

As a result, during this period, our wealth of knowledge has increased enormously and the knowledge continuum has expanded along with it. Unfortunately, this has led to a serious instability in the terminology used by and among members of the various communities, and *pari passu*, to communication barriers between those who create knowledge and those who receive it. Such barriers have a negative impact on the possibilities for accurate acquisition of knowledge and successful implementation of innovative research outcomes.

This paper demonstrates the problem and its consequences by examining the concept known as the “knowledge continuum” and the variety of terms that have been adopted or introduced by users to designate the phases which make up that continuum. Some of these terms have the same meaning, some have expanded meanings, and some are endowed with entirely new meanings. Among these terms are “knowledge transfer,” “knowledge translation,” “knowledge management,” “knowledge mobilization,” and “knowledge flow.” In addition, the paper discusses inconsistency in the use of words such as “application,” “implementation,” and “utilization,” and argues that the absence of a commonality of meaning for these terms among those who utilize them inevitably reduces the effectiveness of communication and, as a consequence, the efficacy of project implementation. In view of this, members of all disciplines are urged to make a concerted effort to establish and adhere to common terminologies.

10.2

On the Phrase “It may be good in theory, but not in practice”: How a focus on implementation might affect our thoughts on inter- and transdisciplinarity

J. Britt Holbrook, University of North Texas, USA

Keywords: theory, practice, judgment

Interdisciplinarity (the integration of multiple academic disciplines) and transdisciplinarity (the integration of an academic/disciplinary perspective with perspectives that transcend academe) are often held up as our best (and sometimes only) hopes for addressing (or perhaps solving) complex societal problems. But there are several tacit philosophical presuppositions underlying this appeal to inter- and transdisciplinarity. The most obvious presupposition is that academic disciplines, whether singly (disciplinarity) or in aggregate (multidisciplinarity), are not sufficient to deal with complex problems – in other words, there’s a bias toward holism behind calls for inter- and transdisciplinarity. There also exists a kind of bias toward the idea that theoretical adequacy depends on a disciplinary approach, to the expense of practical problem-solving ability. Hence, the implicit critique of disciplinary approaches to knowledge is that disciplinarity may be good in theory, but not in practice. The next move in the critique of disciplinarity is to suggest that inter- or transdisciplinarity is needed in practice to make up for the theoretical bias of disciplines. The irony of the situation, of course, is that inter- and transdisciplinarity are so difficult to implement in practice. Is it the case, then, that inter- and transdisciplinarity, far from overcoming the theoretical blinders and practical limitations of disciplinary approaches to knowledge, actually compound the problem, since inter- and transdisciplinarity are not only theoretically, but also practically inept compared to disciplinarity? Should we focus on a theoretically adequate account of inter- and transdisciplinarity? Does that tend toward a disciplined approach to inter- and transdisciplinarity? Should we instead focus on practice and ignore theory? Are we any better off with that strategy? Or is it the case that a focus on implementation is the Achilles’ heel of inter- and transdisciplinarity?

10.3

Transdisciplinary Research: Method or Paradigm? Consequences for “implementation”

Martina Ukowitz, University of Klagenfurt, Austria

Keywords: Paradigm, method, attitude, implementation as an integrative process, intervention research

A survey of the discourse on transdisciplinary research (td) shows that there are different views concerning the self-conception of this form of research. In its dialectic approach intervention research is particularly interested in uncovering contradictions since they do not just indicate ‘different opinions’, but reveal important characteristics of a topic. Contradictions in a dialectic view are not resolvable in a true-false logic, they just can be balanced. In case of td-research’s self-conception the underlying question is whether it should be considered as a new method, which is being applied within a traditional scientific paradigm, or as ‘a value per se’, thus forming a new research paradigm.

Many of the important topics for td-research are influenced by this fundamental difference between ‘method within the familiar’ and a new paradigm. These would, for instance, be the ways of defining research questions, intensity and quality of participation, the integration of different forms of knowledge into the research process or the question of how results in td-research look. However adequate answers in the context of transdisciplinary work might not fit with the systems logics of science working in the logics of “mode 1 knowledge production” or even with a half-hearted “mode 2-approach”. Taken seriously, the tendencies that led to the development of td-research lead also to the hypothesis that new answers are necessary. Implementation cannot be simply understood as an “add-on”, as a technique, as a uni- or multidirectional procedure, but as a fundamental attitude and therefore it requests an integrative process which starts at the very beginning of every research activity.

Experiences from the projects in intervention research have shown that careful order clarification with the actor groups that are concerned, integration of different stocks of knowledge in the analysis phase, the designing of common reflection (first within the research team and then with practice partners) and the development of decision topics together with practice partners are crucial. Of course research processes like that need an adequate organizational framework, researchers with competences in designing communication processes (not only within the research team, but with the actor-groups that are supposed to use the results of research), and the general attitude that implementation in practice is at least as important as generating contributions for scientific discourses (still working in a modus 1 logic). And it requires a lot of patience. With a careful design we can support implementation but in the end practice partners have their own way to process the interventions. Often it takes some time to bring research activities into fruition.

Voices of the Community: A collection of statements on implementation

The statements were collected in the context of the 3rd td-conference „Implementation in Inter- and Transdisciplinary Research, Practice and Teaching“ and appear in no particular order.

From an Inter- and Transdisciplinarity perspective, we define the multidimensional concept of “implementation” as a dynamic process of embedding research results in the life-world. We consider implementation in action as a co-productive, non-linear, non-hierarchical and reverse process of translation, which involves a new integration of theories, methods and practices of teaching and research across and beyond scientific disciplines and paradigms in order to describe, analyze and understand the complexity of theoretical and practical questions in various fields. This dynamic process finds its full expression across a new dialogue between academic and non-academic networks and actors so as to identify complex problems, develop research questions and elaborate solutions in everyday practices and concrete situations.

Frédéric Darbellay
Institut Universitaire Kurt Bösch, Sion

The word implementation has multiple meanings in German: “praktische Anwendung”, “Umsetzung”, “Einführung” are just a few of them. In our work on health of humans and animals we aim at effective large scale application of interventions for which we have evidence for their efficacy. Specifically, some disease can only be controlled if a large proportion of individuals are vaccinated or treated. Hence implementation means the application or use of an intervention by a large fraction of the population, across gender and social classes, making such an intervention “equity effective”. Outcomes to measure the effect of implementation are for example a declining incidence of a particular disease, but also a permanent adoption of a particular preventive behaviour. In our experience, implementation, requires a transdisciplinary process involving communities and authorities to negotiate a best possible contextual adaptation.

Jakob Zinsstag
Swiss Tropical and Public Health Institute, Basel

Transdisciplinary research tries to link problems of society with the scientific knowledge, a concern that necessarily leads to the question of implementation. In the context of Intervention Research we don't understand implementation in a technical way, in the sense that scientific results could directly be transferred into action by practice partners, but as a process of different steps in our problem-oriented work. Our interdisciplinary teams invite people concerned to participate in the research process (implementation of a mixed community). To discuss the generated hypotheses we build up a communication structure to create shared knowledge (implementation of structures). Finally we organize a process of decision making (but we don't participate in it) with the aim of reaching a conclusion within the social system concerned.

Larissa Krainer & Martina Ukowitz
Institut für Medien- und Kommunikationswissenschaft &
Institut für Interventionsforschung und Kulturelle Nachhaltigkeit Alpen-Adria-
Universität Klagenfurt

Implementation means that research results are put to use. In my view it is central to understand implementation not as a linear process (first research, then implementation) but as the result of long-term research collaborations and reciprocal knowledge exchange between knowledge producers and users.

Christoph Küffer
Institute of Integrative Biology, ETH Zurich

Implementation is a joint process. Due to the complexity of problems, no single person can implement alone. During implementation processes learning loops can enrich the research results by adding context. Thus, implementation is not about transferring knowledge from research to practice but about mutual learning. Implementation is social learning. It has the character of real-world experiments for researchers – learning about the context of application. However, the governance of our research systems focuses primarily on the production of knowledge instead of its contextualization, application or societal relevance. Thus, engaging in implementation processes, pilot projects or putting this knowledge to test in societal practices are less attractive. (Also, implementation is not a game – it costs real money and concerns real world problems). Implementation is an experiment. It's in the nature of experiments that these can fail. So, allow yourself to fail – or die trying (and learn from it!).

Kirsten Hollaender
Programme Office Foundation Knowledge for Climate, Utrecht

In a context related to policy, I believe that „implementation“ is a complex, dynamic process which puts policy into effect. The process is part of a continuum that encompasses the design, execution, and evaluation of a course of action. It is affected by a variety of interrelated factors including power, decision-making, and capacity to act. The implementation process is influenced by the action and/or inaction of the ideas, interests, and institutions that may be affected by the proposed policy.

Ruth J. E. Jones
Canadian Academy of the Arts

It is a little funny that td-net chooses „implementation of transdisciplinary research“ as conference title and not „implementation by transdisciplinary processes“. For me, and I guess for most researchers who have practical experience in transdisciplinary research (and not only on the meta-level-debate), transdisciplinary processes are a means to overcome the old implementation or outreach-problem. In transdisciplinary processes, implementation starts from the very beginning, as those, who are responsible for social and/or physical changes participate in capacity building by mutual learning among science and society from the first day of a transdisciplinary project.

Roland W. Scholz
Institute for Environmental Decisions IED, ETH Zurich

I am coming from a design background where problem solving of complex social, ecological or even political problems is increasingly becoming our job (not just making nice and functional things). Implementation within the context of transdisciplinarity for me means materialisation of an idea – will the end result be a model, system or experience. In the best case scenario it means fruitful synthesis of often multiple theories and practices.

Zane Berzina
Textile and Surface Design Department, Kunsthochschule Berlin-Weissensee

Implementing research hypotheses is – besides e.g. coherence (i.e. freedom from contradictory claims) – the most important way of validating them. Implementation under stated conditions allows to make reasonable claims in terms of predictability. In turn, successful implementation, i.e. fulfilment of previously agreed upon expectations is a gate-opener of transdisciplinary co-operation, implementation being the ground on which otherwise divergent interests may meet. It contributes to create trust and therefore stimulate interest in research. Implementation is not synonymous with success. A common focus on implementation allows for failure to be transformed into a learning experience.

Thomas Bearth
University of Zurich

swiss-academies award for transdisciplinary research

The *swiss-academies award for transdisciplinary research (td-award)* is allocated biannually in recognition of and to give visibility to outstanding transdisciplinary work carried out by an individual or a research team.

The winner or winning team receives *75,000 Swiss Francs* for a follow-up project. Awarded by *Stiftung Mercator Schweiz*, this is the highest research prize of the Swiss Academies of Arts and Sciences.

It was launched in 2004 by the *td-net for Transdisciplinary Research*, a swiss-academies organisation, as one of their major means along with the annual international td-conference to promote excellence in transdisciplinary research, practice and teaching as well as to encourage especially young researchers to participate in transdisciplinary projects. Selected members of the board form the Jury of experts in transdisciplinarity who evaluate the quality of the submitted projects according to the criteria developed and published by the td-net.

For further information about the td-award and the work of the td-net go to: www.transdisciplinarity.ch

17.30 pm	Start of ceremony
Welcome Address	Professor <i>Jakob Zinsstag</i> , td-net and td-award jury
Greeting	<i>Beno Baumberger</i> , Mercator Foundation Switzerland
Laudatio	Professor Peter Suter, President of the Swiss Academies of Arts and Sciences
Prize Giving	To «eDiversity»
Appraisal	Of shortlisted projects Of life-long dedication to td research
Speech	Professor <i>Christoph B. Graber</i> , award recipient,
18.30 pm	End of ceremony, followed by an apéro

Award Recipient 2010: eDiversity

The td-award 2010 is given to

eDiversity:
The Legal Protection of Cultural Diversity
in a Digital Networked Environment

for its integrative, timely and path-breaking intervention in the field of media regulation concerning the protection and promotion of the diversity of old indigenous as well as very new cultural expressions.

The research was carried out from 1 September 2005 to 31 August 2009 under the directorship of Prof. Dr. Christoph B. Graber at i-call, the research centre of international communications and art law at the University of Lucerne.

Further Appraisals 2010

Shortlisted projects:

«BiodiverCity» (Marco Moretti, WSL)
«Therapeutic and Sensory Garden at the RehaClinic Zurzach»
(Renata Schneider-Ulmann, ZHAW)

Life-long dedication to transdisciplinary research:

Prof. em. Dr. Thomas Bearth, University of Zurich

Mercator Foundation Switzerland

The Mercator Foundation Switzerland is one of Switzerland's largest foundations. It initiates and funds projects that promote better educational opportunities in schools and universities. In the spirit of Gerhard Mercator, it supports initiatives that embody the idea of open-mindedness and tolerance through intercultural encounters, encouraging the sharing of knowledge and culture. The foundation provides a platform for new ideas to enable people - regardless of their national, cultural or social background - to develop their personality, become involved in society and make the most of the opportunities available to them. Mercator Foundation Switzerland takes an entrepreneurial, international and professional approach to its work.

Bringing forward new ideas

The Foundation makes grants on three broad subject areas: Science and Research, Children and Youth Education, and Tolerance and Intercultural Understanding.

Science and Research

The Mercator Foundation Switzerland supports higher education in Switzerland aiming at increasing its competitiveness and quality as well as its ability to train students in an outstanding way. The foundation believes that a carefully reasoned and systematic understanding of the forces of nature and society, when applied inventively and wisely, can lead to a better world for all. The foundation offers support for scientific meetings in Switzerland to strengthen scientific relations and to undertake innovative research. It makes grants that foster a better public understanding of the increasingly scientific and technological environment in which we live. And it attaches great importance to funding inter- and transdisciplinary research projects, since this approach is a necessary prerequisite for tackling new research topics and innovation.

Children and Youth Education

The Mercator Foundation Switzerland provides young people with the opportunity of a integrated education and promotes cultural, scientific and social engagement. The foundation aims to strengthen and propel children to achieve success as individuals and as contributors to the society. It provides proposals for improving Switzerland's educational system and concepts for early-childhood education. It supports civic involvement and initiatives to improve historical and political awareness in Switzerland.

Tolerance and Intercultural Understanding

The Mercator Foundation Switzerland recognizes the importance of developing tolerance and understanding between people for the development of a peaceful society. The foundation funds projects which encourage dialogue and mutual understanding between people from different cultures. It develops and funds initiatives that help improve the integration of young people in Switzerland with a migration background.

Our commitment to the td-conference 2010

As part of its encouragement for Science and Research, the Mercator Foundation Switzerland supports the td-net for transdisciplinary research, its annual conferences and the td-award. We think it is essential to transcend disciplinary boundaries and to include knowledge from academic and non-academic experts. We encourage you to take personal and professional advantage of this unique transdisciplinary and international meeting and to learn from each other.

Albert Kesseli
Managing Director

Learn more about the Mercator Foundation Switzerland:
www.stiftung-mercator.ch

Contact
Stiftung Mercator Schweiz
Gartenstrasse 33
Postfach 2148
CH - 8022 Zurich
Phone: +41 44 206 55 80
E-Mail: mercator@stiftung-mercator.ch

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. Up to 2011, the financing of the conference is guaranteed thanks to the generous support of the Stiftung Mercator Schweiz.

Extending over two days, the event is organized in collaboration with a different Swiss university or research institute each year. The overall theme is chosen by the Scientific Board whose members also act as 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 is English.

Every second year, the conference includes the ceremony of the bi-annual td-award in recognition of excellent transdisciplinary research, also funded by the Stiftung Mercator Schweiz.

This is thus the third in a series of four td-conferences. Please join us again in 2011 in Berne (14-16 September), when the conference on issues of *evaluation* will be organised together with the Swiss National Science Foundation, so that we can learn from each other's approaches and project, 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.

Main Organizer	td-net for Transdisciplinary Research www.transdisciplinarity.ch Manuela Rossini (Project Manager td-conference) Theres Paulsen (Co-Director) Christian Pohl (Co-Director) Pasqualina Perrig-Chiello (President of the Scientific Board)
Partner Institute	Human Ecology Group, Institute for Environmental Sciences, University of Geneva www.unige.ch/ecohum/index_en.html Roderick J. Lawrence (Director)
Steering Committee	Board members of the td-net Dominique Joye Roderick J. Lawrence Michael Nentwich Pasqualina Perrig-Chiello Bernhard Truffer Doris Wastl-Walter Urs Wiesmann Jakob Zinsstag Jürg Pfister (SCNAT) Martine Stoffel (SAGW) Hermann Amstad (SAMW) Rolf Hügli (SATW) Beat Butz (SNF) Daniel Marti (SBF) Sergio Bellucci (TA-SWISS)
Support	Stiftung Mercator Schweiz www.stiftung-mercator.ch Beno Baumberger (Communications) Nadine Felix (Projects) Center for the Study of Interdisciplinarity csid www.csid.unt.edu Robert Frodeman (Director) J. Britt Holbrook (Assistant Director)

The «Swiss Academies of Arts and Sciences»

The association of the «Swiss Academies of Arts and Sciences» includes the Swiss Academy of Sciences (SCNAT), the Swiss Academy of Humanities and Social Sciences (SAHS), the Swiss Academy of Medical Sciences (SAMS), and the Swiss Academy of Engineering Sciences (SATW). Their collaboration is focused on early detection, ethic and the dialogue between science and society.

www.swiss-academies.ch

Institutional partner 2010:
Human Ecology Group, Institute for Environmental Sciences,
University of Geneva



**UNIVERSITÉ
DE GENÈVE**

**INSTITUTE FOR
ENVIRONMENTAL SCIENCES**

Financial support of the conference:



**Stiftung
Mercator
Schweiz**

td-net for Transdisciplinary Research
Schwarztorstrasse 9, CH-3007 Bern
phone: +41 (0)31 310 40 94 or +41 (0)44 632 63 10
fax: +41 (0)31 312 16 78
td-net@scnat.ch, www.transdisciplinarity.ch