INTERNATIONAL TRANSDISCIPLINARITY CONFERENCE 2019

JOINING FORCES FOR CHANGE

Gothenburg, Sweden
10 – 13 September 2019

Conference Centre Wallenberg

swiss academies
of arts and sciences

td-net
Network for Transdisciplinary Research

UNIVERSITY OF GOTHENBURG

MISTRA
URBAN
FUTURES

International TransDisciplinarity Conference 2019

Conference 2019

Joining forces for change

JOINING FORCES FOR CHANGE

Our societies are facing critical points in their development, where large challenges are becoming increasingly difficult to handle. Numerous conflicts and complexities are surfacing – to which we can see societies responding with fragmentation, intolerance and exclusion. One way to address such developments is through societal transformation processes that implicitly include a variety of interest groups, stakeholders and organisations. Transdisciplinary (TD) research is one approach that focuses specifically on co-producing and integrating knowledge and expertise from a variety of sources, including communities, research, cities and businesses. It is an approach that is driven by the need to create processes where values and transformations towards a more just and sustainable society are openly debated.

The aim of this conference, Joining Forces for Change, is to bring together actors from different professional mandates, disciplines and sectors to engage and discuss practical examples and case studies that approach societal transformation through boundary breaking collaboration. The conference invites practitioners and researchers from government and administrative organisations and agencies, interest groups from community and business, and researchers and students from across the university. The overall focus is on what we can learn from our collaborative experiences, case studies and practices regarding wider societal transformation, methodological innovations and theoretical development. We will specifically search for "sites for change" in terms of spaces, practices and learnings where TD research and co-production play a crucial role.

Since the first international TD conference we organised 11 years ago, the field has developed considerably. It has expanded into a number of areas such as urban development, health, pedagogy, indigenous studies, natural resource management, art, etc. It has also attracted researchers from a variety of related approaches, for example action research, participatory social science and sustainability science. An additional goal of this conference is therefore to bring together this growing body of practitioners and researchers who are working in different types of collaborative research and change processes, to gauge the state of the art in both research and practice from across sectors and disciplines, and to create an international forum where diverse groups can exchange experiences and learn from each other.

Thank you for joining us and for collaborating to make the ITD Conference 2019 happen! We hope that your stay in Gothenburg will be enriching and memorable!

Merritt Polk
University of Gothenburg
School of Global Studies
Sweden

Henrietta Palmer
Mistra Urban Futures and
Chalmers University of Technology
Sweden

Tobias Buser
Network for Transdisciplinary
Research (td-net)
Switzerland

TD-NET AND THE INTERNATIONAL TRANSDISCIPLINARITY CONFERENCES

The Network for Transdisciplinary Research (td-net) was initiated by the Swiss Academic Society for Environmental Research and Ecology (SAGUF) at the first International Transdiciplinarity Conference 2000 in Zürich. Since 2008 td-net is an initiative of the Swiss Academies of Arts and Sciences. The main goal of td-net is to advance transdisciplinary research and teaching in all thematic fields. As a platform, td-net advances the mutual learning between inter- and transdisciplinary researchers and lecturers across thematic fields, epistemic and geographic backgrounds and thereby supports community and capacity building. As centre of competences td-net disposes of expertise, methods and tools for co-producing knowledge between academic and non-academic actors. With these competences td-net supports inter- and transdisciplinary projects in research and teaching.

As a cornerstone in its activities, td-net organises International Transdisciplinarity Conferences (ITD). These conferences aim at building and fostering transdisciplinary communities, bringing together scholars from different epistemic backgrounds and enabling to show and reflect the state of td-research and to spark further development and cooperation. After the initial conference in 2000, the years from 2008-2011 have seen a series of conferences tackling main challenges of transdisciplinary projects: Problem Framing (2008), Integration (2009), Implementation (2010) and Evaluation (2011). In 2015, the relationship between Sustainability and Health and Transdisciplinarity was explored. In 2017 we started to consequently co-organise the ITD with partner organisations. Together with the Leuphana University of Lüneburg the we focussed on Transdisciplinary Research and Education as Intercultural Endeavours.

At these conferences, an open and dynamic international network was growing, with an increasing number of organisations engaged in various aspects of transdisciplinarity and related fields. It is a great pleasure to welcome an important number of these organisations as partners for this year's conference – please find the list of partners on the back cover. The partner organisations do not only represent important transdisciplinary communities but also enabled reduced fees for students and participants from low income countries.

As an important further step of collaboration between and beyond these partners, the International Alliance for Inter- and Transdisciplinarity will be founded at this conference.

The ITD 2019 title Joining Forces for Change is highlighting the need for collaboration to approach the grand societal challenges. Two organisations joined td-net to co-developing and hosting this conference: Mistra Urban Futures and the University of Gothenburg. td-net likes to express its warmest gratitude to both institutions and their teams for their outstanding engagement to enable this conference!

Jakob Zinsstag,
President of the Scientific Advisory Board of td-net
www.transdisciplinarity.ch

CONTENT

For latest updates and room changes please consult the online program or app.

TEAMS AND COMMITTEES

STRATEGIC BOARD

The strategic board integrates leaders of transdisciplinary partner networks and communities, and leaders of the organising institutions.

- Gabriele Bammer, Australian National University, College of Medicine, Biology and Environment, and Leader of Integration & Implementation Sciences (I2S), Australia
- Matthias Bergmann, Institute for Social-Ecological Research (ISOE), Germany
- Lisa Diedrich, Swedish University of Agricultural Sciences (SLU), Department of Landscape Architecture, Planning and Management, Sweden
- Elma Duracovic, Mistra Urban Futures, Sweden
- Thomas Elmquist, Stockholm University, Stockholm Resilience Centre, Sweden
- Steve M. Fiore, University of Central Florida and International Network for the Science of Team Science (INSciTS), USA
- Eva Friman, Uppsala University, Swedish International Centre of Education for Sustainable Development (SWEDESD), Sweden
- Machiel Keestra, University of Amsterdam, Institute for Interdisciplinary Studies and Association for Interdisciplinary Studies (AIS), The Netherlands
- Erica Key, Executive Director of the Belmont Forum
- Barry Ness, Lund University Centre for Sustainability Studies, Sweden
- Fredrik Nilsson, Chalmers University of Technology, Department of Architecture and Civil Engineering, Sweden
- Beth Perry, University of Sheffield, Urban Institute, UK
- Martina Schäfer, Technische Universität Berlin, Center for Technology and Society (ZTG), Germany
- David Simon, Mistra Urban Futures, Sweden
- Warren Smit, African Centre for Cities, South Africa
- Vivi Stavrou, International Social Science Council, France
- Maria José Zapata Campos, University of Gothenburg, Department of Business Administration, Sweden
- Jakob Zinsstag, Swiss TPH , University of Basel and President of the Network for Transdisciplinary Research (td-net), Switzerland

PROGRAMME BOARD

The members of the Programme Board are reviewing the submitted abstracts and are thus fostering the high quality of the contributions.

- Dena Fam, University of Technology Sydney, Australia
- Sabine Hoffmann, Eawag, the Swiss Federal Institute of Aquatic Science and Technology, Switzerland
- Daniel K. B. Inkoom, Kwame Nkrumah University of Science and Technology, Ghana
- Julie Klein, Association for Interdisciplinary Studies (AIS), USA
- Anna Ledin, Director of the Environmental Administration in the City of Gothenburg, Sweden
- Lars Lilled, Senior Consultant, Gothenburg, Sweden
- Catherine Lyall, University of Edinburgh, School of Social and Political Science, UK
- Cynthia Mitchell, University of Technology Sydney, Australia
- Michael O'Rourke, Michigan State University, Center for Interdisciplinarity and Department of Philosophy, USA
- Zarina Patel, University of Cape Town, Environmental & Geographical Science, South Africa
- Christian Pohl, ETH Zurich, D-USYS TdLab and Network for Transdisciplinary Research (td-net), Switzerland
- Jan C. Schmidt, University of Applied Science Darmstadt, Germany and Network for Transdisciplinary Research (td-net)
- Flurina Schneider, University of Bern, Centre for Development and Environment, Switzerland
- Ulli Vilsmaier, Leuphana University, Center for Methods, Faculty of Sustainability and Digital Cultures Research Lab (DCRL), Germany

CORE TEAM

- Merritt Polk, University of Gothenburg, School of Global Studies, Sweden
- Henrietta Palmer, Mistra Urban Futures and Chalmers University of Technology, Sweden
- Tobias Buser, Network for Transdisciplinary Research (td-net), Switzerland

ORGANISATION TEAM

- Hannah Saldert, University of Gothenburg, School of Global Studies, Sweden
- Lydia Moreno, Network for Transdisciplinary Research (td-net), Switzerland
- Sibylle Studer, Network for Transdisciplinary Research (td-net), Switzerland

CONFERENCE SCHEDULE

	Tuesday Sept 10		Wednesday Sept 11	Thursday Sept 12	Friday Sept 13
08:15-08:40	Registration	**08:15-08:40**	Registration	Registration	Registration
08:40-10:45	Workshops	**08:40-10:20**	Plenary I: Societal transformation	Parallel Sessions	Parallel Sessions, Urban Forum
coffee					
11:15-12:45	Workshops	**10:50-12:30**	Parallel Sessions	Plenary III: Methods for Transdisciplinarity	Concluding Plenary
lunch					
14:00-15:30	Workshops, Network meeetings	**13:40-15:20**	Parallel Sessions, Poster Session	Parallel Sessions, Poster Session	Excursions, Network Meetings
coffee					
16:00-18:00	Workshops, Network meeetings	**15:50-17:30**	Plenary II: Theoretical development	Parallel Sessions, Urban Forum	Excursions, Network Meetings
evening	Welcome Reception (18:00-19:30)	**17:30-18:30**	Urban Forum Opening, ITD Alliance presence, AIR Network exhibition opening		
			Conference Dinner (start 18:30)		

PROGRAM

TUESDAY, 10 SEPTEMBER 2019

08h15 – 08h40 **REGISTRATION**
[Foyer/Lobby]

08h45 – 10h45 **PARALLEL WORKSHOPS I**

Scenario Analysis for Evaluating Transformation: Mobilizing Transdisciplinarity for Transformative Sustainable Urban Development
[Europa]
Adam Peter Hejnowicz, Jessica PR Thorn, Zenda Ofir, Glenn Page

Is There a New Profession of 'Integration Specialists/Experts' on the Rise?
[Antarktis]
Sabine Hoffmann, Dena Fam, Cynthia Mitchell, Christian Erik Pohl, Julie Thompson Klein

Using Embodied Practices and Threshold Concepts in HESD: Enabling Transformative Learning in the Liminal Space
[Sydamerika]
Ruth Dorothea Förster, Petra Biberhofer

How to Develop Normative Competence? A Design Thinking Short Format with the Case Study of the Managing Global Governance (MGG) Academy
[Nordamerika]
Tatjana Reiber, Christine Blome

Putting Joint Problem Framing in Focus: Working Together to Hone a Transdisciplinary Skill
[Asien]
BinBin Jiang Pearce, Olivier Ejderyan, Jenny Lieu

COFFEE BREAK

11h15 – 12h45 **PARALLEL WORKSHOPS II**

Id/Td Coordinators' Networking on Successful Concepts for Meetings or Events
[Europa]
Sabine Toussaint

Creating a Desired Landscape of Toolkits for Inter- and Transdisciplinarity
[Antarktis]
Sibylle Studer, Gabriela Wuelser, Gabriele Bammer, Stephen M. Fiore, Alexandra Lux, Theres Paulsen, Christian Pohl

The Role of Co-Creative Processes to Facilitate Change
[Sydamerika]
Johann Rehnberg, Sophia Kaså

Developing Theories of Change for Supporting Sustainability Transformations: A Serious Game
[Nordamerika]
Theresa Tribaldos, Flurina Schneider

Interdisciplinary and Transdisciplinary 'Failures' as Lessons Learned
[Asien]
Dena Monique Fam, Michael O'Rourke

LUNCH BREAK

14h00 – 15h30	**PARALLEL WORKSHOPS III**

Advantages and Challenges of Facilitation of TD Research for Urban Projects
[Europa]
Kerstin Hemström, Henrietta Palmer, Siri Kjellberg, Maria Helena Guimarães, Roderick Lawrence, Pia Andersson

Develop Your Own Science Shop: A One Stop Shop for Participatory Research
[Antarktis]
Helen Garrison

Envisioning Circular Economies – Future Workshops as a Research Method
[Sydamerika]
Malin Henriksson, Martin Hultman, Jens Millkrantz

Extending the Outcome Spaces Framework (or OSF+): A Workshop for Practitioners to Explore Planning for Outcomes in Transdisciplinary Research
[Nordamerika]
Melissa Robson-Williams, Ronlyn Duncan, Dena Fam, Cynthia Mitchell

The Transdisciplinary "Delta-Analysis" and System Innovation Processes Towards SDG´S
[Asien]
Silke Kleihauer, Martin Führ, Julian Schenten

COFFEE BREAK

16h00 – 18h00	**PARRALEL WORKSHOPS IV**

Towards the Establishment of a New Transdisciplinary Area of Scholarship in Infrastructure and Cities
[Europa]
Joanne M Leach, Chris D F Rogers, Paul Jeffrey, Colin Taylor, Tom E Dolan, Chris I Goodier, Katherine Adams

Transformative Learning Across the Lifespan: The Potential of New Transdisciplinary Learning Formats Linking Personal Development, Professional Upskilling and Societal Transformation
[Antarktis]
Björn Müller, Ruth Förster, Aleksi Neuvonen, Miikka J. Lehtonen, Marea Hildebrand

Touching the Intangible: Using Image Theatre as an Embodied Method to Access Deep Leverage Points in Inter- and Transdisciplinary Research
[Sydamerika]
Sadhbh Juarez-Bourke

Urban Living Labs: Exploring Possible Solutions to the Various Challenges of Participation
[Nordamerika]
Selma L'Orange Seigo, Matthias Probst, Michael Stauffacher, Yann Blumer, Evelyn Lobsiger-Kägi

Which Research Approach Should I Employ in My Research Project? Developing Criteria-Based Guidance on Choosing the Most Appropriate Research Approach Among TD Case Study, Living Lab, Action Research, Urban Transition Lab, Real-World Lab, Applied Disciplinary Research, and Others
[Asien]
Michael Rose, Annaliesa Hilger, Matthias Wanner, Tom Dedeurwaerdere

18h00 – 19h30	**WELCOME RECEPTION** [Foyer/Lobby] *Drinks and snacks will be provided.*

08h15 – 08h40

REGISTRATION
[Foyer/Lobby]

08h40 – 10h20

PLENARY I: SOCIETAL TRANSFORMATION
[Wallenbergsalen]

Keynote I: Public Sector Perspectives on Societal Transformation and TD
Mikael Cullberg, Head of the Governor's Chancellery at the Swedish County Administration Agency

Keynote II: The Time is Now.
Are We Ready to Rumble for Societal Transformation?
Dena Fam, Associate Professor
Cynthia Mitchell, Distinguished Professor
Institute for Sustainable Futures, University of Technology Sydney, Australia

COFFEE BREAK

10h50 – 12h30

PARALLEL SESSIONS I

Capturing and Strengthening Societal Effects of TD-Research (Part I)
[Wallenbergsalen]
Organiser(s): Martina Schäfer, Alexandra Lux, Sabine Hoffmann, Lisa Verwoerd, Stephen Williams, Jens Newig, Brian Belcher, Christian Eismann, Rachel Claus, Matthias Bergmann

I. Closing the research-to-practice gap: A conceptual model for Transdisciplinary Sustainability Research
Sabine Hoffmann, Christian Pohl, Julie Thompson Klein

II. Assessing the societal impacts of transdisciplinary research projects using impact narratives: a mixed methods approach
L. Verwoerd, R. De Wildt-Liesveld, P. Klaassen, B.J. Regeer

III. Sustainability Transition Impacts: Evaluating Transdisciplinary Sustainability Transition Experiments
Stephen Williams, John Robinson

IV. Linking Modes of Research to their Academic and Societal Impact. Evidence from 80 Sustainability-oriented Research Projects
Jens Newig, Daniel J. Lang, Stephanie Jahn, Judith Kahle, Matthias Bergmann

Dynamics of Inter- and Trans-Disciplinarity within Institutions: Cultures and Communities, Spaces and Timeframes
[Europa]
Organiser(s): Bianca Vienni Baptista, Julie Thompson Klein
with:

- Dena Fam, Associate Professor, Research Director, Institute for Sustainable Futures, University of Technology, Sydney.
- Beatrice Akua-Sakyiwah, Coordinator and Lecturer, Gender Development and Resource Centre GIMPA, School of Public Services and Governance, Ghana.
- Danilo R. Streck, Professor at the Graduate School of Education, Unisinos University, Brazil.
- Catherine Lyall, Professor of Science and Public Policy Science, Technology & Innovation Studies, School of Social and Political Science, University of Edinburgh, United Kingdom.

More Than Teaching – Transdisciplinary Capacity Building I (composed session)
[Antarktis]

I. Key competences of master's students to design and lead transdisciplinary research in intercultural settings in the Global South
Danny Nef, Pius Krütli, Michael Stauffacher

II. Intercultural learning for transdisciplinary research collaboration
Dorji Thinley, Sonam Wangmo, Ugyen Lhendup, Isabel Sebastian, Katie Ross

III. Collaborating with Civic Society Actors in Higher Education Teaching – Shaping the Moments of Interaction
Annaliesa Hilger

IV. Transformative Innovation Labs – the real-world lab approach in the context of graduate education for sustainability
Philip Bernert, Nele Fischer, Annika Lomberg, Martina Schmitt, Matthias Wanner

Power Dynamics in Transdisciplinary Research: From Power Over to Power With?
[Sydamerika]
Organiser(s): Livia Fritz, Claudia Binder, Tobias Buser, Olivier Ejderyan, Christian Pohl, Isabelle Providoli, Flurina Schneider, Theresa Tribaldos

with impulse talks from:
- Claudia, Binder: Unspoken power-relations and expectations in a developing country, industrialized country and industry context.
- Olivier, Ejderyan: The micropolitics of power in TD research.
- Livia, Fritz: Tracing power relations in five sustainability research projects.
- Flurina, Schneider and Isabelle Providoli: Power dynamics in different socio-political settings.
- Theresa Tribaldos and Flurina Schneider: Emotions in group dynamics on equal footing.

Can We Co-Transfer Urban Transformation Knowledge?
[Nordamerika]
Organiser(s): Diego Sepulveda-Carmona, Lisa Diedrich, Flavio Janches
- Introduction of the case study: the co-transfer of urban transformation knowledge from *Emscher Regeneration* to *Reconquista River Sanitation*
- Discussion of the case study in small groups and plenum

Urban Challenges and Transformations I (composed session)
[Asien]

I. Unbundling the challenges and pathways of transforming African cities through research collaboration in diversity (TACToRCD)
Peter Elias, Adelina Mensah, Iniobong John, Ademola Omojola, Bunmi Alugbin

II. Insights from the AIR Network: A transdisciplinary approach to addressing air pollution in informal settlements
Fiona Lambe, William Apondo, Cressida Bowyer, Patrick Büker, Cindy Gray, Matthew Hahn, Miranda Loh, Medcalf Alexander, Cassilde Muhoza, Kanyiva Muindi, Timothy Njoora, Heather Price, Charlotte Waelde, Megan Wainwright, Anna Walnycki, Jana Wendler, Sarah West, Mike Wilson, Residents Mukuru Informal Settlement

III. Urban transformation and the relevance of critical infrastructure – a systemic and participatory approach
Markus Groth, Steffen Bender, Elisabeth Viktor

IV. Experimental Governance Practices: Emergence and effects of central approaches in neighbourhood development – experiences from Malmö
Nina Vogel, Joakim Nordqvist, Jamil Khan, Roger Hildingsson

V. Design-driven co-creation in living environments: Shared interorganizational meanings?
Christina Vildinge, Elena Raviola

LUNCH BREAK

13h40 – 15h20 **PARALLEL SESSIONS II**

Capturing and Strengthening Societal Effects of TD-Research (Part II)
[Wallenbergsalen]
Organiser(s): Martina Schäfer, Alexandra Lux, Hoffmann Sabine, Verwoerd Lisa, Williams Stephen, Newig Jens, Belcher Brian, Eismann Christian, Claus Rachel, Bergmann Matthias

I. Societal effects of transdisciplinary sustainability research – How can they be strengthened during the research process?
Alexandra Lux, Martina Schäfer, Matthias Bergmann, Thomas Jahn, Oskar Marg, Emilia Nagy, Anna-Christin Ransiek, Lena Theiler

II. Assessing transdisciplinary research design and implementation for outcomes: Lessons from 9 projects
Brian Belcher , Rachel Claus, Rachel Davel, Luisa Ramirez, Stephanie Jones

III. Innovation management for sustainability projects. Becoming effective with limited resources
Christian Eismann, Susanne Schön

Transdisciplinarity, Policy, and Public Institutions (composed session)
[Europa]
I. From reflex to reflexivity in governmental expert agencies
Eva-Maria Kunseler, Lisa Verwoerd

II. Environment Courts in Chile: First steps understanding transdicipline as a tool
Sibel Villalobos

III. Yarra Valley Water: Australian water utility or a transdisciplinary research organisation?
Francis Pamminger, Cynthia Alison Mitchell

IV. Transdisciplinary agenda setting for research and innovation
Niklas Gudowsky, Mahshid Sotoudeh

Interaction and/or Intergration? Discussing Priorities for Co-Production (composed session)
[Antarktis]
I. Interaction versus integration in transdisciplinary research
Dena Monique Fam, Ronlyn Duncan, Melissa Robson-Williams, Zoe Sofoulis

II. Tracing the engagement of actors: The influence of rationales and infrastructure of transdisciplinary team formation
Kerstin Hemström, Merritt Polk, Henrietta Palmer

III. What shapes stakeholders' participation in transdisciplinary workshops? Towards a sociological concept of knowledge and interaction
Maurice Skelton, Christian Pohl

Assessing Co-Production and Steakholder Engagement (composed session)
[Sydamerika]
I. Collaborating for sustainability: the lived experience of citizens and scientists in transdisciplinary research projects - New stories from Germany and Portugal
Antje Disterheft, Tomás B. Ramos, Georg Mueller-Christ

II. Initial involvement of stakeholders in transdisciplinary projects - exploring issues of expectations, roles and inclusion
Helena Kraff, Eva Maria Jernsand, Lillian Omondi, Emma Björner, Sayaka Osanami Törngren

III. The MAZI transdisciplinary process
Ileana Apostol, Panayotis Antoniadis, Gareth Davies, Mark Gaved, Andreas Unteidig

IV. Lessons from a co-design process: how early involvement of local people can enrich the coastal management process
Floortje Marijn d'Hont, Jill Hillary Slinger

V. Exploring what makes co-design salient, legitimate and credible for the stakeholders involved in a transdisciplinary project on nature-based solutions and urban innovation: Lessons learnt from a DELPHI survey
Claudia Basta, Eva Kunseler, Clara Veerkamp, Ed Dammers, Ton Dassen

More Than Teaching – Transdisciplinary Capacity Building II (composed session)
[Nordamerika]

I. Conceptual and Methodological Advances in Transdisciplinary Team Science Training
Stephen Martin Fiore, Troy Hartley, Linda Schaffner, Karen McGlathery, Deborah DiazGranados

II. Challenge Lab – A strategic approach for transdisciplinary university-society interaction to navigate sustainability transitions
John Holmberg, Johan Larsson

III. Transdisciplinary pathways for systemic change in Small Island Developing States – lessons learned in a Sustainability Learning Lab in the Seychelles
Pius Krütli, Danny Nef, Michael Stauffacher

IV. Transdisciplinary learning: Exploring and testing different pedagogical approaches in a transdisciplinary learning context
Merritt Polk, Henrietta Palmer

POSTER SESSION (PART I)
[Foyer/Lobby]

I. The Health Protection Research Unit in Respiratory Infections: A case study of transdisciplinary research in England.
Luis C. Berrocal-Almanza, Grace Smith, Maria Zambon, Ajit Lalvani

II. CoNavigator - a tool for interdisciplinary collaboration and problem-solving
David Earle, Line Hillersdal, Katrine Lindvig

III. The Stage Model of Self-Regulated Behavioural Change and its Contributions to Sustainable Transformations
Charis Eisen, Jana Köhler, Anna Keller, Daniel Hanß, Silke Kleihauer, Nathalie Wendorff

IV. Transdisciplinarity in Horizon 2020 and Horizon Europe
Joël Graf

V. Results and lessons learned from the co-development and implementation of user-specific climate service products for companies
Markus Groth, Peer Seipold

VI. Transdisciplinary processes, dialogue, common interests
Mª Helena Guimarães, Teresa Pinto Correia

VII. Perspective of non-scientific Actors in Local Collaborative Research Processes
Annaliesa Hilger

COFFEE BREAK

15h50 – 17h30 **PLENARY II: THEORETICAL DEVELOPMENT**
[Wallenbergsalen]
Moderation: Henrietta Palmer, Artistic Professor, Architect SAR/MSA, Department of Architecture; Deputy Scientific Director, Mistra Urban Futures, Gothenburg, Sweden

Keynote I: An Introduction to Transdisciplinary System Thinking for Tackling Wicked Problems
Gerald Midgley, Professor of Systems Thinking in the Centre for Systems Studies, Business School, University of Hull, UK

Keynote II: Issues and Challenges for Theoretical Development in TD Research
Merritt Polk, Head of Department, Professor in Human Ecology, School of Global Studies, University of Gothenburg, Sweden

17h30 – 18h30	**SIDE EVENTS** [Foyer/Lobby] **Urban Forum Practice meets Academia** Organiser(s): Lisa Diedrich, Per-Johan Dahl *Opening of the Exhibiton:* Wednesday, 11.09.2019, 17h30 – 18h30, [Foyer/Lobby] *Floor talks:* Thursday, 12.09.2019, 15h50 – 17h30, [Foyer/Lobby]; Friday, 13.09.2019, 08h40 – 10h20, [Foyer/Lobby] **The Alliance for Inter- and Trans-Disciplinarity (ITD-Alliance) Is Founded at the International Transdisciplinarity Conference 2019 in Gothenburg - Meet Founding Members for Information and Exchange!** Organiser(s): Alliance for Inter- and Trans-disciplinarity ITD-Alliance *Meet & Greet:* Wednesday, 11.09.2019, 17h30 – 18h30, [Foyer/Lobby] **The AIR Network Exhibition: A Transdisciplinary Approach to Addressing Air Pollution in Informal Settlements** Contributor(s): Cressida Bowyer, William Apondo, Patrick Bueker, Cindy Gray, Matthew Hahn, Fiona Lambe, Miranda Loh, Alexander Medcalf, Cassilde Muhoza, Kanyiva Muindi, Timothy Njoora, Heather Price, Charlotte Waelde, Megan Wainwright, Anna Walnycki, Jana Wendler, Sarah West, Mike Wilson, Residents Mukuru Informal Settlement *Opening of the Exhibiton:* Wednesday, 11.09.2019, 17h30 – 18h30, [Foyer/Lobby]
18h30 – 21h00	**CONFERENCE DINNER** [Restaurant Norden, Wallenberg Conference Centre] *pre-booking only*

THURSDAY, 12 SEPTEMBER 2019

08h15 – 08h40

REGISTRATION
[Foyer/Lobby]

08h40 – 10h20

PARALLEL SESSIONS III

Platforms for Transdisciplinary Co-Production – Stakeholder Perspective on Challenges and Opportunities
[Wallenbergsalen]
Organiser(s): Elma Durakovic, Sanna Isemo

I. Introduction to Gothenburg Local Interaction
Elma Durakovic, Gothenburg Local Interaction Platform

II. Stakeholder perspective from the public sector
Presenter: tbc

III. Stakeholder perspective from academia
Presenter: tbc

IV. Panel discussion: How can these challenges be converted into opportunities? Can we overcome all challenges? What those it mean to involve other actors such as the civil society and private sector?
Gothenburg City (tbc), Elma Durakovic (Platform director) Mikael Cullberg (Chair of the Consortium), Gothenburg University (tbc)

V. Discussion session

Crossing the Line – Reimagining Synthesis Work
[Europa]
Organiser(s): Jonas Bylund, Caroline Dahl, Lisa Diedrich, Andrea Kahn, Katarina Schylberg

I. Why" reimagine synthesis? - Panelist presentations

II. "How to" interactive synthesis - Participatory demonstration

III. "What next – reflectivity on the go" - Observations/provocations for future work

Pathways to Impact of Transdisciplinary Research: The Role of Contexts, Goals, and Epistemological Assumptions
[Antarktis]
Organiser(s): Flurina Schneider, Claudia Binder, Tobias Buser, Livia Fritz, Sabine Hoffmann, Zarina Patel, Christian Pohl, Isabelle Providoli, Thorsten Schilling, Theresa Tribaldos

I. Expected and experienced effects of participation – a systemic analysis of perceptions of researchers and practitioners in sustainability research
Claudia R. Binder, Livia Fritz and Thorsten Schilling

II. Promises and potentialities of transdisciplinary practices in African cities: Learning from LIRA 2030
Zarina Patel and Flurina Schneider

III. From transdisciplinary knowledge production to societal transformations: Pathways explored by projects on urban development
Tobias Buser et al.

IV. Change Theory Thinking for Investigating Pathways to Impact of Transdisciplinary Sustainability Research
Flurina Schneider et al.

Exploring Methods I (composed session)
[Sydamerika]

I. Ale municipality in 360 degrees - A participatory transdisciplinary Agenda 2030 process
John Holmberg, Johan Larsson, Birgitta Augustsson Nilsson, Julia Widbom

II. The 'Research Forum' as a methodological tool for transdisciplinary co-production
Mirek Dymitrow, Karin Ingelhag, Shelley Kotze

III. Sustainability transition scenario planning. A transdisciplinary case study from Blekinge in Southeast Sweden
Henrik Ny, Varvara Nikulina, Giles Thomson, Sven Borén

IV. Storytelling as a Transdisciplinary Tool for Disentangle Local Energy Challenges
Giulia Sonetti, Ruth Mourik, Rosie Robinson

V. How transdisciplinary research can engage with systems thinking and scenario planning through Bayesian Networks: The case of climate change impacts on water in the Maghreb region
Laura Woltersdorf

Science Meets Practice: Reflections on Doing Transdisciplinary Work from a Learner's Perspective
[Nordamerika]
Organiser(s): Jenny Lieu, Maria Andrade, Claudia Beck, Mohammad Hatamjafari, Francesco Femi Marafatto, BinBin J. Pearce, Lisa Deutsch

I. Introduction of the TdLab Winter School and key transdisciplinary principles; clarification questions; transition activity

II.Panel session: How can TD principles support team building?

III. Questions and reflections from audience

The Rural-Urban Nexus: A Transdisciplinary Innovation Platform to Establish Nutrient Loops for Improving City - Region Food System Resilience Across Africa (RUNRES)
[Asien]
Organiser(s): Benjamin Wilde, Chris Buckley, Alfred Odindo, Pius Kruetli, Cathy Sutherland, Rob Slotow, Marc Schut, Speciose Kantengwa, Simon Shibru, Johan Six, Leonhard Spaeth

I. Brief introduction to RUNRES

II. Panel discussion with an interdisciplinary team of contributors from RUNRES

III. Open discussion

COFFEE BREAK

10h50 – 12h30   **PLENARY III: METHODS FOR TRANSDISCIPLINARITY**
[Wallenbergsalen]

Joint Interactive Keynote: Methods for Transdisciplinarity and How to Use Them
Sophia Kaså, Mistra Urban Futures and Katalysator, Sweden
Christian Pohl, ETH Zurich, D-USYS TdLab, Switzerland

LUNCH BREAK

13h40 – 15h20   **PARALLEL SESSIONS IV**

Enabling Social Learning and Societal Change (composed session)
[Wallenbergsalen]

I. Co-producing knowledge for societal change: Reflections on ten years of the CityLab programme in Cape Town
Warren Michael Smit, Mercy Brown-Luthango, Liza Rose Cirolia, Rike Sitas

II. Review of 20 transdisciplinary research cases: towards understanding the effects of design features on social learning
Agathe Osinski, Pauline Herrero, Tom Dedeurwaerdere

III. Transdisciplinary approaches in sustainability of socio-ecological systems studies. A methodology proposal for implementation and evaluation in three contrasting case studies. (Colombia, France & Mexico)
Aurélie Chamaret, Driss Ezzine de Blas, Jose Alvaro Hernandez, Clara Ines Villegas Palacio, Céline Lutoff, Nicolas Buclet, Sandra Lavorel

IV. Emergence from a living laboratory site for transformative change
Aditi Rosegger, Cynthia Mitchell

V. FutureTalks: A Case Study in Transdisciplinary Co-production for Transformative Urban Sustainability
John Robinson, Stephen Williams, Blake Poland, Cheryl Teelucksingh, Wendy Wong, Tamer El-Diraby, Kim Slater, Pani Pajouhesh, Gregoire Benzakin

Roles and Careers for Transdisciplinarians (composed session)
[Europa]

I. Who is doing inter- and transdisciplinary research, and why? – An empirical case study of motivations, attitudes, skills, and behaviours
Mª Helena Guimarães, Cristian Pohl, Marta Varanda, Olivia Bina

II. Chance, balancing act, challenge – doing PhDs in transdisciplinary projects
Sebastian Rogga, Jana Zscheischler

III. New roles for researchers in system innovations: case study of the Knowledge-Action Programme on Water
Laurens Hessels, Michaela Hordijk, Andrew Segrave

IV. How not to be an expert – Strategic questioning as an approach to support learning and transformation
Stefan Hilser

How Can Research Funding Programmes Enhance Transdisciplinary Co-Production of Knowledge?
[Antarktis]
Organiser(s): Flurina Schneider, Tobias Buser, Catherine Lyall, Isabelle Providoli, Zarina Patel, Katsia Paulavets, Vivi Stavrou, Christian Eismann, Antonietta Di Giulio, Rico Defila

I. Research Funding Programmes Aiming for Societal Transformations: 10 Key Stages.
Flurina Schneider et al.

II. Supporting the Swiss NRP 72 on One Health and antimicrobial resistance
Isabelle Providoli et al.

III. Accompanying research as a catalyst for integration? Experiences with German research funding bodies
Antonietta Di Giulio and Rico Defila

IV. Fostering transdisciplinary in the German Programme "innovation groups for sustainable land management"
Christian Eismann

V. A UK Perspective on ITD Research Funding Programmes
Catherine Lyall

VI. ICS's LIRA 2030 in Africa
Katsia Paulavets et al.

Urban Challenges and Transformations II (composed session)
[Sydamerika]

I. Decoding social constructs towards acceptability and sustainable implementation of decentralized waste-water treatment system in African informal settlements: A Tanzania case study
Dickson Wilson Lwetoijera, Alfred Boniphace, Beda Levira, Phumlani Sikhosana, Chris Buckley

II. Challenge Driven Innovation in Urban Planning - Unpacking Transdisciplinarity in Practice
Anna Sundman, Karin Kjellson, Magnus Björkman, Maja Westman

III. Moving from multidisciplinary practice to interdisciplinary process, to meet societal challenges within sustainable urban regeneration
Josefine Wikholm

IV. Collaborative learning in Multi-Stakeholder Initiatives for a Transformation of the Textile Industry: The Case of the German Partnership for Sustainable Textiles and its initiative to improve working conditions in the textile and clothing industry in Tamil Nadu, India.
Felix Beyers

Interculturality – Bridging Epistemologies (composed session)
[Nordamerika]

I. A critical, southern eye on transformative adaptation
Alice McClure, Lulu Van Rooyen, Patrick Martel, Anna Taylor, Lorena Pasquini, Chipo Plaxedes Mubaya, Rudo Mamombe

II. 'Culture-blindness' and its consequences for transdisciplinary research in sustainable development
Kim Liv Gordon

III. From Reverse Innovation to Global Innovation through multilingual collaboration
Kristina Pelikan, Jakob Zinsstag

IV. Transdisciplinary dialogue of wisdoms for societal transformations
Adriana Moreno Cely, Dario Cuajera, Cesar Escobar, Nelson Tapia, Tom Vanwing

POSTER SESSION (PART II)
[Foyer/Lobby]

I. Double jeopardy within Swedish Integration: Using South-North collaborations to explore the role of gender within transdisciplinary integration projects
Shelley Kotze, Mirek Dymitrow, Lilian Omondi

II. TREND (TRansdisciplinary ENgineering Design) Research Group
Susan Lattanzio, Linda Newnes, Alex Huktin

III. Transforming education and research through an Honours Programme. Case: Transdisciplinary Insights KU Leuven.
Jorge Ricardo Nova Blanco, Griet Ceulemans, Andreas De Block, Anne-Mieke Vandamme

IV. Concept for Formative Evaluation in Climate Services
Susanne Schuck-Zoeller, Herrmann Held, Elke Keup-Thiel

V. Integration of end users in the process of developing an innovative urban climate model - testing and evaluating the prototype
Bettina Steuri, Matthias Winkler, Sebastian Stadler, Sebastian Stratbücker, Jörg Cortekar, Steffen Bender

VI. LIRA-GR/2019 Project: Theory of change to integrate sanitation and hygiene on groundwater security on the Cities of Cotonou and Lomé
Henri Sourou Totin Vodounon, Koko Zébéto Houedakor, Clarisse Sidonie Hedible, Komlan Avougla

VII. The Knowledge Integration Questionnaire (KIQ): Development and validation of a measure for assessing analytical skills in inter- and transdisciplinary work
Olga Skrebec, Marcel Hunecke

COFFEE BREAK

15h50 – 17h30

PARALLEL SESSIONS V

Institutionalising Transdisciplinarity (composed session)
[Wallenbergsalen]

I. Towards sustainable development of the Caucasus mountain region: integrating transdisciplinary teaching and research into the practice of universities in Armenia and Georgia
Tamara Mitrofanenko, Andreas Muhar, Tigran Keryan, Lela Khartishvili

II. Towards Implementing Transdisciplinarity in Post-Soviet Academic Systems: An Investigation of the Societal Role of Universities in Armenia
Tigran Keryan, Andreas Muhar, Tamara Mitrofanenko, Verena Radinger-Peer, Christian Pohl, Ashot Khoyetsyan

III. Building and Supporting Transdisciplinary Arts Collaborations: On Campus and Beyond
Stephanie Vasko

IV. How does the Global Land Programme foster transformative science through knowledge co-production?
Isabelle Providoli, Albrecht Ehrensperger, Jean-Christophe Castella, Narcisa Pricope

V. Transdisciplinarity & SDGs: which Strategies for Academic Institutions Working on Cities?
Giulia Sonetti, Olivia Bina, Marta Varanda, Carlo Sessa, Igor Campillo, Giulio Verdini, Josefine Fokdal, Katrin Padaam

Evaluation - Different Perspectives (composed session)
[Europa]

I. Evaluative and enabling infrastructures: Supporting the ability of urban co-production processes to contribute to societal change
David Simon, Henrietta Palmer, Merritt Polk

II. What do review panels do when they take funding decisions about transdisciplinary research?
Antonietta Di Giulio, Rico Defila

III. Uncovering the perspective of participants of a transdisciplinary dialogue – The case of Tertúlias do Montado, Alentejo, Portugal
Mª Helena Guimarães, Christian Pohl

IV. Transforming complex policy evaluation through co-production: innovating for change
Amy Louise Proctor, Adam Hejnowicz, Frances Rowe, Jeremy Phillipson

Funding Transdisciplinary Research – Innovative Approaches
[Antarktis]
Organiser(s): Tobias Buser, Flurina Schneider
Funding Agencies: Belmont Forum, Judit Ungvari Martin; National Science Foundation NSF, Dragana Brzakovic; Wellcome Trust, José Siri; Robert Bosch Foundation, Andrea Bruhn; Austrian Science Fund, Uwe Von Ahsen (tbc.); MISTRA, European, Comission (tbc).
Science Policy Organisations: International Science Council ISC, Vivi Stavrou and Katsia Paulavets; Organisation for Economic Cooperation and Development OECD, Carthage Smith

I. 10 key stages for Research funding programmes aiming for societal transformations

II. Funders briefly presenting innovative approaches in their funding scheme(s), addressing specific stages

III. Discussing promising approaches, integrating examples from the audience

IV. Discussion on gaps and challenges

V. Outlook, potential next steps to advance funding for transdisciplinary research

Methodological Developments to Foster Transformation (composed session)
[Sydamerika]

I.More than generalisation of knowledge and creating outputs – Recommendations for promoting transfer of results to new contexts
Emilia Nagy, Anna Ransiek, Martina Schäfer, Alexandra Lux, Matthias Bergmann, Thomas Jahn, Oskar Marg, Lena Theiler

II. Societal transformation through grassroots innovation. The diffusion of sustainability knowledges and practices through transdisciplinary research
Willington Ortiz, Ulli Vilsmaier

III. Moving feet, thoughts and lives: a learning experience for the collaborative management of Xalapa's cloud forest, Mexico
Loni Hensler, Juliana Merçon, Ulli Vilsmaier

IV. Evaluating the Integration and Implementation Sciences Framework
Melissa Robson-Williams, Bruce Small, Roger Robson-Williams

Dialogue, Discourse, and Engaging Different Voices (composed session)
[Nordamerika]

I. Contemplating Complexities: Enabling transdisciplinary dialogue in co-production processes.
Johan Larson Lindal, Varvara Nikulina, Henrik Ny

II. Detecting Integrative Discourse in Team Meetings
Bethany K. Laursen, Michael O'Rourke

III. Listening to the loud and soft voices of interdisciplinarity to enable societal transformation
Katrine Lindvig, Catherine Lyall

IV. Refreshing Transdisciplinary Research: the Challenges of Research with Children in Intercultural Contexts
Frédéric Darbellay, Zoe Moody

Theorising Transdisciplinarity (composed session)
[Asien]

I. There is nothing as practical as a good theory – Systemic Organizational Theory, Dialectics and Transdisciplinary Research
Martina Ukowitz

II. Towards theorising rich learning cultures of transdisciplinary research
Alice McClure, Gina Ziervogel, Zarina Patel, Joanne Hardman

III. Flattening the Hierarchies of Producing Sustainability Science: A Gender Perspective
Kareem Buyana, Jacqueline Walubwa

IV. Designing a transformative epistemology of the problematic. A perspective for transdisciplinary sustainability research.
Daniela Peukert, Esther Meyer

SIDE EVENT

[Foyer/Lobby]
Urban Forum Practice Meets Academia: Floor Talks (Part I)
Organiser(s): Lisa Diedrich, Per-Johan Dahl

FRIDAY, 13 SEPTEMBER 2019

08h15 – 08h40 **REGISTRATION**
[Foyer/Lobby]

08h40 – 10h20 **PARALLEL SESSIONS VI**

Quality of Transdisciplinary Research Processes for Fostering Transformations? More Than Evaluation Criteria!
[Wallenbergsalen]
Organiser(s): Alexandra Lux, Martina Schäfer, Rico Defila, Antonietta Di Giulio, Christoph Görg, Flurina Schneider

Discussion of three questions:
- How can the different quality requirements of the different actor groups regarding processes result in a shared responsibility for effective research?
- How can self-reflection efforts be combined with an external assessment of high-quality and effective research processes and outputs?
- What are the limitations and risks involved in defining quality under a perspective of shared responsibility in transdisciplinary research?

I. input by the organizers containing short statements on their perspectives and perceptions of the quality discourse in transdisciplinary research

II. the participants will develop a common understanding resp. a notion of differences in understandings regarding the three above questions using interactive formats

How Can Science Policies, Universities and Research Institutions Enable Trans-Disciplinary Research to Address Societal Challenges?
[Europa]
Organiser(s): Carthage Smith, Jakob Zinsstag, Tobias Buser, Christine Ahrend, Audrey Podann, Bianca Vienni, Vivi Stavrou

I. Presentation of the outcomes of the OECD-GSF case study analysis – "Challenges and potential solutions to implementing TDR approaches"
Jakob Zinsstag

II. Institutionalisation of transdisciplinarity at the Technical University of Berlin
Christine Ahrend, Audry Podann

III. The case of the Leuphana University of Luneburg. Transdisciplinary institutionalization in higher education: a two–level analysis
Bianca Vienni Baptista

IV. Panel discussion "Building synergies between national and institutional policies, including mandates and incentives, to support TDR".
Panellists to include presenters and representatives from OECD-GSF, td-net and ISC

V. Open discussion "priorities for policy action to address societal challenges using TDR"

Exploring Methods II (composed session)
[Antarktis]

I. Opening Conversations by Design Methods: Participatory Network Mapping
Elif Erdoğan Öztekin, A. İdil Gaziulusoy

II. Potential Methodological Contributions of Collaborative and Participatory Design to Theory and Practice of Transdisciplinary Research
Emīlija Veselova, A. İdil Gaziulusoy

III. MathWeave: an Exemplar of Transdisciplinary Work
Eva Knoll, Wendy Landry, Tara Taylor, Paul Carreiro, Katie Puxley

IV. Charettes and CoNavigator: Combining methods to support collaboration across time, space, institutions and disciplines
Katrine Lindvig, Line Hillersdal, David Earle

More Than Teaching – Transdisciplinary Capacity Building III (composed session)
[Sydamerika]

I. A Transdisciplinary Approach to Sustainable Life Systems in Colombia's University Education
Raphael Ferbas

II. What should education be like? Fostering awareness and practice of intrinsic nature of self
Tomohiro Akiyama

III. Legit Failz: Training academia in techniques of improvisational theatre
Marius Korsnes, Sophia Efstathiou, Sven Veine, Martin Loeng, Kristoffer Nergård, Giulia Sonetti

IV. Developing a conceptual framework on coastal resilience to guide transdisciplinary research in the Chesapeake Bay region
Justin Lee Shawler, Vanessa Constant, Amber Leasure-Earnhardt, Ali Mohammad Rezaie, Laura Szczyrba, Janie Day Whitworth

Go-Between or Critical Friend: The Role of Intermediaries in Transdisciplinary Research on Sustainable Cities
[Nordamerika]
Organiser(s): Anna Taylor, Zarina Patel, Amy Davison, Magnus Johansson
Panel discussion consisting of 6 panellists, made up of 3 sets of pairs. Each pair will be one intermediary and one representative from an organization that intermediary worked with. In rounds of inputs, each pair will:

I. briefly describe the context and substantive focus of their transdisciplinary work;

II. explain how the intermediary role was set up, including what the expectations or terms of reference for the intermediary was; and

III. reflect on the opportunities, challenges and impacts of intermediation.

Transdisciplinary Approaches to Natural Resources- and Climate Management
(composed session)
[Asien]

I. Innovations for Sustainable Land Management
Jana Zscheischler, Sebastian Rogga, Thomas Weith

II. Conditions for successful knowledge co-production: Insights from river management
Jennifer Henze, Barbara Schröter, Christian Albert

III. Experiences from a participatory action research project on agroforestry in Sweden
Christina Schaffer, Karin Eksvärd, Johanna Björklund

IV. Assessing UseUClim´s living lab approach to co-develop the new urban climate model PALM-4U
Bettina Steuri, Jörg Cortekar, Steffen Bender

V. In-house-evaluation of a transdisciplinary research product – a case study from the field of climate service
Elke Keup-Thiel, Susanne Schuck-Zoeller

SIDE EVENT
[Foyer/Lobby]
Urban Forum Practice Meets Academia: Floor Talks (Part II)
Organiser(s): Lisa Diedrich, Per-Johan Dahl

COFFEE BREAK

10h50 – 12h30   **CONCLUDING PLENARY**

[Wallenbergsalen]

Keynote 1: Transdisciplinarity as Critical Transdisciplinarity

Matthias Bergmann, Thomas Jahn, ISOE – Institute for Social-Ecological Research, Germany

Keynote 2: How Can Transdisciplinarity Research Be Fostered in Science Policy and International Public Institutions

Flavia Schlegel, Special Envoy for Science in Global Policy, International Science Council (ISC), France

Highlights and Perspectives from the Conference Organisers

Merritt Polk, Henrietta Palmer, Tobias Buser, Hannah Saldert

Participants' Perspectives

LUNCH BREAK

13h45 – 17h15   **EXCURSIONS**

[Information and registration at the conference desk]

PARALLEL WORKSHOPS I

SCENARIO ANALYSIS FOR EVALUATING TRANSFORMATION: MOBILIZING TRANSDISCIPLINARITY FOR TRANSFORMATIVE SUSTAINABLE URBAN DEVELOPMENT

Tuesday, 10.09.2019, 8h45 – 10h45
[Europa]

Adam Peter Hejnowicz[1,5], Jessica PR Thorn[1,4], Zenda Ofir[2,6], Glenn Page[3]
[1]University of York; [2]University of Stellenbosch; [3]SustainaMetrix; [4]University of Capetown; [5]Centre for the Evaluation of Complexity Across the Nexus (CECAN); 6: Evaluation for Development
Keywords: Evaluation, Scenario planning, Transformation, Transdisciplinary, Urbanisation

Context

Considerable rhetoric, confusion and debate underpin the 'transformations for sustainability' narrative. Some consider it a neo-liberal policy; others, a set of buzzwords that will soon give way to a new wave of fashionable concepts. Yet local development occurs in a trans-local context, and transformation is urgently needed for societal and ecosystems' wellbeing. Achieving sustainable, transformative change requires multiple co-aligned actions and unconventional, innovative ways of working. Evaluative practice can be central to any effort aimed at resolving these complex and multivalent issues, yet it is seldom appropriately used in local to global governance systems. This situation has to be improved.

Focus

Evaluation for Transformation is concerned with informing transitions to sustainability and is relevant to all SDGs, as integrated pathways for achieving Agenda 2030 require robust evaluation of the evidence for progress across all areas. However, its importance is emphasised in SDG 17: "Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development". Notably, a core feature of Evaluation for Transformation is its transdisciplinary ethos, concerned with the application, coordination and bringing together of multiple knowledges, experiences and cultures.

Purpose

1) To bring greater clarity to how transformational evaluative practices employing complexity science, critical systems thinking, and systems governance can be mobilised *across diverse epistemic communities: policy, practice and research*. Highlighting the importance of leveraging multiple public, private and civic sectors to help navigate the wicked problems associated with delivering the SDG Agenda 2030. Acknowledging the importance of integrated SDG policymaking; the role of expertise; capacity building; networking key epistemic communities and influencers across local and global scales; and considering key drivers, barriers and opportunities for applying transformational evaluation practices.

This links to the *Societal Transformation* stream question: "What forms of organising are needed for our institutions, agencies, companies and universities to handle the necessary transformations, with particular reference to collaboration between different types of stakeholders?"

2) To familiarise participants with an innovative systematic methodology of Participatory Scenario Planning (PSP) for creatively envisioning and planning for diverse, plausible futures for sustainable transformation. Scenarios are coherent, internally consistent and plausible descriptions of possible future states of the world. PSP aims to reach a representation of potential futures that explicitly integrates diverse stakeholder views, needs and expectations, as well as the values and assumptions underpinning these perspectives. As such PSP is an *inherently transdisciplinary* methodology aligning with the ethos of *co-production* and *social learning*. Grounding the ideas presented in (1) in real-world practice, we will consider SDG Goal 11: Make human settlements inclusive, safe, resilient and sustainable - and targets linked to the environment (e.g., 11.3 (spatial development), 11.7 (green spaces), 11a (rural-urban linkages), 11b (risk reduction)).

These issues connect to three key cross-cutting questions: the *Societal Transformations* stream question: "What skills and competences are needed by civil servants, researchers and students to co-design and lead processes that target sustainable outcomes?" the *Methodological Innovation* stream question: "How can different types of transdisciplinary pedagogies, research methods and processes of co-production be developed to more effectively

contribute to societal transformations?" and the *Theoretical Development* stream question: "How does TD research engage with systems thinking, scenario planning, design thinking and other holistic theories and practices?"

Workshop Session Design

We will ask, how can PSP be used by local municipalities to evaluate transformative adaptation pathways, and build capacity in strategic foresight to achieve SDG11? Policies evaluated will relate to informal settlement upgrading towards improved ecological infrastructure (e.g. ecosystem-based adaptation), and human wellbeing (e.g., social equity and cohesion). The session will employ a scenario-based approach pioneered by several international organisations (e.g. World Bank, IPBES, CCAFS). Envisioning desirable urban transformations will consider multiple dimensions of social-ecological systems.

In advance of the session we will request participants to consider past land use transitions, key drivers of change and to draw a cognitive map with a narrative to represent attributes of the system (nodes) and their interactions (vectors). The workshop will last for 120 minutes and proceed as follows:

1) Introduction (10m)
2) Boundary setting and definitions of transformation (20m);
3) Rapid characterization of past transformations and clustering ranking drivers of change (20m);
4) Envisioning desirable and undesirable futures (20m);
5) Build scenario narratives using the Three Horizons model, assigning likelihood and uncertainties to identified outcome, and synergies and trade-offs of adaptation pathways for disruptive change and new paradigm shifts (40m); and
6) Overall evaluation of process and application for innovation portfolios for policy and practice (10m).

Target communities

- Practitioners and transdisciplinary researchers working public, private and civic sectors working across scales
- Development and environment research community working on the cutting-edge, including evaluation practitioners
- Boundary organizations and think tanks
- Policymakers from local, national and regional governments building capacity to meet their SDG evaluation challenges
- Funders charged with evaluating outcomes (e.g. IDRC, DFID, USAID, SIDA, WISER, AU, UNECA etc.)

Workshop Learning Goals

Better understanding, and hence eventually more practical engagement among the target audience with:

- Critical roadmaps for future work in achieving SDG 11: Three storyline narratives, ranked key drivers of change and envisioned futures.
- Shared system understanding and richer appreciation of the present (e.g., informal settlement upgrading policies' effectiveness)
- Key issues to consider when dealing with transformation as concept and practice in the SDG context, specifically in relation to policy evaluation
- Active participant engagement with transdisciplinary sustainability science
- Conversations of innovation portfolios (e.g., of Climate Change Agriculture and Food Security (CCAFS), IMPACT of the World Bank, CLAUS-Kesho, International Panel of Biodiversity and Ecosystem Services)
- Furthering efforts to ensure networked platforms that can engage with the very substantial expertise of the international platform, the SDG Transformation Forum and its Evaluation for Transformation Working Group
- New opportunities for collaboration, partnerships and knowledge exchange

Key readings

1. SDG Transformations Forum, Transformational Evaluation for Transformational Development (TE-TD) Manifesto (Available at: www.transformationsforum.net/wp-content/uploads/2018/08/TE-TD-WG-Manifesto-Pre-final-31-July-2018.pdf)
2. Amer M, Daim TU, Jetter A (2013) A review of scenario planning. Futures 46:23–40
3. UN-HABITAT (2016) SDG Goal 11 Monitoring Framework: A Guide to Assist National and Local Governments to Monitor and Report on SDG Goal 11 Indicators. UN-HABITAT Technical Report. (Available at: https://unhabitat.org/wp-content/uploads/2016/02/SDG-Goal%2011%20Monitoring%20Framework%2025-02-16.pdf)

IS THERE A NEW PROFESSION OF 'INTEGRATION SPECIALISTS/EXPERTS' ON THE RISE?

Tuesday, 10.09.2019, 8h45 – 10h45
[Antarktis]

Sabine Hoffmann[1], Dena Fam[2], Cynthia Mitchell[1,2], Christian Erik Pohl[3], Julie Thompson Klein[3,4]

[1] Eawag, Swiss Federal Institute for Aquatic Science and Technology, Switzerland; [2]Institute for Sustainable Futures, University of Technology Sydney, Australia; [3]USYS TdLab, ETHZ, Switzerland; [4]Wayne State University, USA

Keywords: New profession, 'integration specialists/experts', professional identities, professional roles, professional capabilities

Integration is widely regarded as both the key feature and the core challenge of transdisciplinary research. Connotating a process of creating a coherent and comprehensive whole of different perspectives brought together[1], integration is often considered critical to the success (or failure) of transdisciplinary research[2,3]. Given the importance of integration, the contributors call attention to the emergence of a new profession of 'integration specialist/experts'[4] specializing in leading processes of cognitive, social, and affective integration within transdisciplinary projects and programs. However, this new profession is not yet fully established[5]; i.e. the roles and functions of 'integration specialists/experts' are often poorly specified, involving a sense of 'in-between-ness'[6]. Some are able to position themselves as 'specialists/experts' leading processes of integration, while others describe their 'in between' position as 'invisible'[7] or 'between worlds'[8].

Given these ambiguities, it is no surprise that the concept of 'integration specialists/experts' is vague, including the various professional identities 'integration specialists/experts' construct, the diverse roles, responsibilities and functions they assume, as well as the different skills, competencies and capabilities they require to successfully lead processes of integration. Even so, in recent years, scholars started to carry out qualitative research to address challenges researchers face when leading processes of integration[9]. Building on this empirical work and involving those who consider themselves as 'integration specialists/experts' within transdisciplinary projects or programs, the workshop aims at

1) exploring the concept of 'integration specialists/experts'
    1) characterising professional identities of 'integration specialists/experts',
    2) discussing their professional roles, responsibilities and functions
    3) analysing their skills, competencies and capabilities,
    4) identifying challenges 'integration specialists/experts' face, and potentials they offer to transdisciplinary projects and programs, and
    5) analysing factors that enable/hinder establishment of 'integration specialists/experts' as a new profession.

Workshop design

The workshop starts with very short impulse talks (max. 5 min), followed by structured activities involving all workshop participants to explore the aims listed above, whilst generating data and insights for a collaborative publication on this topic co-authored by all participants.

Impulse talks

- **Is there a new profession of 'integration specialists/experts' on the rise?**

Sabine Hoffmann will present a short summary of her recent research on 'integration specialists/experts' within large transdisciplinary research programs[5,9]

- **A network effort to define a new profession?**

Julie Thompson Klein will report on the current initiative of the Intereach Subgroup of the International Network for the Science of Team Science. She will describe the variety of positions individuals in the subgroup currently occupy and the results of a series of seminars that explored related topics. She will also define characteristic qualities members of the network associate with this kind of positions.

- **Interdisciplinary executive scientist (IES)? A French vision**

Audrey Mazur-Palandre (University of Lyon, France) and Kristine Lund (University of Lyon, France; Centre National Scientifique de Recherche, France) will present a French vision of the emergent profession they call "Interdisciplinary executive scientist (IES)". Based on seven years of experience in structuring inreach and outreach for a large interdisciplinary project, they will address how Science of Team Science can further develop IES competencies and analyze their progress in establishing IES as a profession.

- **Integration Vs Interaction: What new skills should we be focusing on?**

Dena Fam will draw on her recent experience[10] to argue that by focusing on expertise in 'integration', there is the potential to overlook the influence of social, political and cultural contexts in which integration is assumed to take place. In contrast, she argues that expertise in facilitating interaction between knowledge communities is required and underpins successful integration.

Structured activities

We expect all participants to be interested in exploring the emergent profession of integration experts/specialists, while being diverse in their motivations for participating. For example, participants may be more interested in practice, or in theory, or in the relationship between practice and theory, or in how both differ in different sectors/geographies/cultures, etc.; or they may have different kinds of integration experiences (from novice leaders to specialists/experts; from participants in to leaders of integration efforts), etc.;

Our workshop design will account for this diversity. We will use various devices (individual reflections, small group discussions, whole group reflections) to enable mutual learning between and amongst novices, theoreticians/practitioners/observers, and experts/specialists:

1) To *explore the concept of 'integration specialists/experts'* and to *characterise professional identities*, we will collaboratively define from various perspectives (specialists/experts, novices, theoreticians/practitioners/observers) the core facets and key qualities of individual 'integration specialists/experts'

2) To discuss *professional roles, responsibilities and functions,* we will first draw out perceptions of these from various perspectives, then explore similarities and differences, and their implications for developing and applying the necessary *skills, competencies and capabilities* to successfully lead processes of integration

3) To draw out factors that *enable/hinder* establishment of 'integration specialists/experts' as *a new profession*, we will conduct mini-interviews to identify *challenges integration specialists/experts face, and potentials they offer*.

Workshop outcomes

The workshop culminates in planning a joint peer-reviewed publication of all workshop participants on *"Being an 'integration specialist/expert' today: Bridging multiple boundaries in transdisciplinary research"* (Working title).

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USING EMBODIED PRACTICES AND THRESHOLD CONCEPTS IN HESD: ENABLING TRANSFORMATIVE LEARNING IN THE LIMINAL SPACE

Tuesday, 10.09.2019, 8h45 – 10h45
[Sydamerika]

Ruth Dorothea Förster[1], Petra Biberhofer[2,3]
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Keywords: Transformative learning, liminality, threshold concepts, emotions, embodied practices

Transformative learning theory (Taylor 2017) offers a framework for the understanding and the fostering of individual and societal transformation towards sustainability. It is particularly valuable for Higher Education for Sustainable Development (Balsiger et al. 2017, Förster & Mader 2017, Sterling 2011) and complements transdisciplinary and other participatory education approaches (Disterheft et al. 2015, Förster and Mader 2017). According to transformative learning concepts, individual and collective transformation processes require a fundamental change in reference systems of our thinking, feeling and acting, including a change of individual and collectively shared values and belief systems and of corresponding behaviors (Mezirow 2009, Taylor 2017). This encompasses ontological, epistemological learning and in particular axiological learning "deficits" (Biberhofer 2019, Fam et al. 2017). These changes are profound and embodied, i.e. manifest in the body in experiences we make, actions we are taking, in our relations to others or our environment and in altered neuronal pathways or patterns (e.g. Förster 2017, Taylor 2017, p. 21).

One important element of transformative learning is liminality, framing experiences or a "space" in which the "old" reference system and ways of being and acting are not valid anymore and the "new" ones are not clear yet (e.g. Balsiger et al. 2017, Land et al. 2014). Confronted with situations in which the own reference system and behaviors are deeply challenged, e.g. a disorientation dilemma or a crisis, we have to leave our comfort zone and cross a threshold. We are "in-between" in a liminal space which is described as fluid and open (Balsiger et al. 2017, Förster and Mader 2017, Land et al. 2014).

Therefore, learning in the liminal space is particularly emotionally charged and causes stress or doubts and may trigger fears or anxieties. At the same time in the liminal space creativity can be set free and new resources for change can be found. We are enabled to see and do things totally differently.

In order to get not stuck or overwhelmed in the "in-between", learning in a liminal space requires the staging of a "safe" space to allow "the learner" (i) to reflect upon reference systems, ways of being and acting, (ii) open up to creativity (iii) to experiment in an embodied way with "something" new (iv) and to cope with challenging emotions. Approaches in higher education or science for sustainable development including transdisciplinary or other participatory approaches often neglect the importance of the liminal space. Furthermore, they primarily focus on learning at the cognitive level, rather than on addressing also explicitly the emotional, psychomotor/ somatic level in a holistic way. Thus, the embodied nature of transformative learning remains often out of reach.

Particularly the threshold concepts approach for transformative learning acknowledges the importance of liminal experiences and a liminal space (Land et al. 2016, Land et al. 2014).

There is a rich body of knowledge and experience on how to implement threshold concepts (Land et al. 2016) and embodied practices for transformative learning, particularly stemming from outdoor- (e.g. Scott 2013) and somatic-education and counselling (Förster 2017, Halprin 2003, Keleman and Campbell 1999).

In this workshop we want to discuss based on concrete examples, how we can use these threshold concepts for transformative learning in the liminal space combined with embodied practices in order to foster transformative learning in transdisciplinary Higher Education for Sustainable Development (HESD) or other participatory settings

- How can threshold concepts and liminality for transformative learning be applied in transdisciplinary Higher Education for Sustainable Development (HESD)?
- How can the embodied nature of transformative learning, encompassing holistic learning on cognitive, emotional, psychomotor/ somatic and also social levels be addressed?
- What supports what hinders transformative learning in a liminal space in transdisciplinary settings? (e.g. roles of educators)
- How can educators respectively mutual learning partners stage and hold a safe liminal space and facilitate transformative learning, particularly in regard to emotional challenges?

Workshop Design (120')

In the workshop we will apply methods and formats from transformative learning and embodied practices in order to combine experience with reflection on theory and praxis. We will start with own experiences of liminality and its triggers (e.g. the questioning of values or other assumptions of the own thinking, feeling or acting). Based on this the authors will offer a conceptual input on the topic and concrete examples from literature and own professional experience. We will use interactive formats in order to share insights, experiences and discuss further questions guided by the leading questions provided above. We will end with a wrap up and reflect how the results can inform (our) professional engagement (as educators, education designers etc.) for transformative learning in transdisciplinary HESD and beyond.

Literature

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HOW TO DEVELOP NORMATIVE COMPETENCE? A DESIGN THINKING SHORT FORMAT WITH THE CASE STUDY OF THE MANAGING GLOBAL GOVERNANCE (MGG) ACADEMY

Tuesday, 10.09.2019, 8h45 – 10h45
[Nordamerika]

Tatjana Reiber, Christine Blome
German Development Institute / Deutsches Institut für Entwicklungspolitik
Keywords: Normative competence, design thinking, innovation, collaboration in diverse teams, teaching method

The competences that people need to act as drivers of societal transformations towards sustainability are manifold. They include interpersonal competencies to foster cooperation as well as competencies in the analysis of complex systems, the ability to envision future strategies and to strategically develop actions that "enact changes in economic, ecological and social behavior" (de Haan 2006: 22).

This workshop will explore how to develop competences for transformative change. It thereby puts a special focus on normative competence as "the ability to collectively map, specify, apply, reconcile and negotiate sustainability values, principles, goals and targets" (Wieck et al. 2011). The development of these competences is particularly challenging as it involves the level of beliefs, mind-sets and values. Furthermore, it requires to actively look for and address contentious topics that provide a great learning opportunity.

In the understanding of the workshop facilitators, normative competence comprises three dimensions: The ability to
   1) identify, formulate and specify (own) values,
   2) map interconnections, and to analyse and understand complementarities, trade-offs, and conflicts,
   3) develop strategies to deal with trade-offs & conflicts, e.g. negotiation or reconciliation or priorisation (see also Wieck et al 2009).

The aim of this workshop is to jointly develop a set of concrete ideas how learning settings can strengthen the normative competences of participants. We will work with the design thinking approach as a method for innovation.

Literature

de Haan, Gerhard (2006): The BLK '21' programme in Germany: a 'Gestaltungskompetenz'-based model for education for sustainable development. In: Environmental Education Research 12: 1, pp 19-32.

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PUTTING JOINT PROBLEM FRAMING IN FOCUS: WORKING TOGETHER TO HONE A TRANSDISCIPLINARY SKILL

Tuesday, 10.09.2019, 8h45 – 10h45
[Asien]

BinBin Jiang Pearce, Olivier Ejderyan, Jenny Lieu
Transdisciplinarity Lab, ETH Zurich, Switzerland
Keywords: Problem framing, complex problem solving, heuristics framework, reflexivity, transdisciplinary competence

The goals of this workshop are to: 1) Explore existing understandings, concepts and challenges of joint problem framing using the heuristics framework developed by the workshop organizers as a starting point for discussion, and 2) Seed future collaborations related to the further development of joint problem framing.

The workshop is based on a paper which introduces a heuristic framework for helping researchers carry out joint problem framing (JPF) processes in transdisciplinary (TD) research. This framework is intended to help transdisciplinary researchers with different levels of experience to approach problem framing reflexively. The paper also identifies specific, documented challenges in conducting a JPF process and introduces a means to address these challenges. We define joint problem framing (JPF) as an essential element in confronting real-world problems (Hirsch Hadorn et. al 2006; Pohl and Hirsch Hadorn 2006; Rossini 2009). It is the process of clarifying and prioritizing the problem to ensure the relevance of the process and the outcome for the different stakeholders involved (Kønig et al.

2017, Schneider and Buser 2017, Stindt et al. 2016). We would like to use the workshop as an opportunity to discuss different understanding and applications of joint problem framing. The discussion of these variations might then serve as the foundation for the development of a special issue.

Workshop design – 120 minutes

Part 1. (Plenary)

15 min – Introduction to the topic of problem framing in transdisciplinary research and of the heuristics framework

10 min – Questions

30 min – Share experiences of joint problem framing and discussion of concept

5 min - Introduction to special issues concept

10 min - Break

Part 2. (Group work)

20 min – Group work to discuss specific approaches to joint problem framing

15 min – Plenary discussion, bring back key takeaways from group discussions

15 min – Discussion of next steps

Key readings

Bardwell, L. V. (1991). Problem-Framing - a Perspective on Environmental Problem-Solving. *Environmental Management*, *15*(5), 603–612. http://doi.org/10.1007/BF02589620

Pearce, B.J. and Ejderyan, O. (submitted to Sustainability Science). Joint problem framing as reflexive practice: honing a transdisciplinary skill

PARALLEL WORKSHOPS II

ID/TD COORDINATORS' NETWORKING ON SUCCESSFUL CONCEPTS FOR MEETINGS OR EVENTS

Tuesday, 10.09.2019, 11h15 – 12h45
[Europa]

Sabine Toussaint
LMU Munich, Germany
Keywords: management of research associations, concepts for meetings and events

As a manager of several research associations, I found a lot of inspiration in the rare networks of scientific coordinators (in Germany), providing consultation and advice among colleagues. As there will be for sure some colleagues in Gotenborg, who also have the duty and the pleasure of coordinating heterogenous id- or td-projects, I would be pleased create a space to get in contact and exchange experiences.

I propose to focus on concepts for successful meetings or events in the research process. In my experience, there is often simply not enough time to deeply think about reasons, aims, expectations, desired impact and the composition of members. Another challenge is to choose the right setting, agenda, choreographies (dynamics, rhythm) and facilitation. Art of Hosting (AoH) inspired me to stress this issue, there is much more to discover to create professional dialogue and work-processes.

As we do not have the time to jointly work on projects, I invite you to gather and get in contact to find out: Who is here on the ITD with which interest, know-how, need for and about concepts, methods, ideas for meetings and work-processes. So we will have the chance to be in contact and discuss these questions throughout the conference and – maybe – stay in touch for consultation and advice on these matters later on.

A structure for the gathering and getting in contact will be given. Furthermore, it depends on what the group needs and decides.

About the moderator: Coordinator research associations, e.g. www.fordemocracy.de, www.forchange.de

CREATING A DESIRED LANDSCAPE OF TOOLKITS FOR INTER- AND TRANSDISCIPLINARITY

Tuesday, 10.09.2019, 11h15 – 12h45
[Antarktis]

Sibylle Studer[1], Gabriela Wuelser[6], Gabriele Bammer[2], Stephen M. Fiore[3], Alexandra Lux[4], Theres Paulsen[1], Christian Pohl[5]
[1]td-net, Swiss Academies of Arts and Sciences, Switzerland; [2]Research School of Population Health, Australian National University, Australia;; [3]Cognitive Sciences Laboratory, University of Central Florida, USA; [4]ISOE - Institute for Social-Ecological Research, Germany; [5]D-USYS TdLab, ETH Zürich, Switzerland; 6: Swiss Academies of Arts and Sciences, Switzerland
Keywords: Integration and implementation sciences, Science of team science, Inter- and transdisciplinary research methods, Knowledge co-production, Online toolkits

Discussants
Stefan Hilser, Leuphana University, Germany
Kerstin Hemström, Mistra Urban Futures, Sweden

Abstract
Methods, tools and other resources supporting inter- and transdisciplinary research are increasingly provided via online platforms. They emerge from different fields, such as problem solving oriented research for sustainable development, integration and implementation sciences, and science of team science.

In this workshop, we will discuss how we can help users to more easily navigate the vast amount of knowledge now available for their use. On the basis of four tools collections – Tools for Integration and Implementation Sciences (i2S, especially http://i2s.anu.edu.au and http://i2Insights.org); Team Science Toolkit (www.teamsciencetoolkit.cancer.gov); td-academy.org (https://td-academy.org) and td-net Toolbox

(www.transdisciplinarity.ch/toolbox) – we will explore how existing online collections of resources supporting inter- and transdisciplinary research relate to each other, i.e. in what respects they are similar or overlapping; or different, respectively. Inspired by ideas for additional features useful from a newcomer's perspective (Hilser, 2019) as well as Kerstin Hemström from Mistra Urban Futures, we will create a picture of this overall toolkit landscape. On this basis, we want to elaborate with participants how these and other similar toolkits can be more strongly or more directly linked to each other to create a manageable universe for our users. We will discuss which complementing elements – e.g. discussion forums – could be useful for helping to apply the resources and for building a community of practice on methods and tools for co-producing knowledge among experts and stakeholders from science and practice for tackling societal challenges.

Description of the session/workshop design

1) Brief introduction to the workshop and its goals
2) Short introductions to
    a) Tools for Integration and Implementation Sciences (i2S);
    b) Team Science Toolkit;
    c) td-academy.org; and
    d) td-net Toolbox.

These will inform on purpose and history of the online toolkit, who it addresses, how it is structured, the kind of resources provided, as well as ideas on how it could be developed further.

3) Ideas for further helpful features of online toolkits from the perspectives of a newcomer (Stephan Hilser) and Mistra Urban Futures (Kerstin Hemström)
4) Interactive group work to suggest how the toolkits can be mapped into an overall landscape, considering existing and possible useful future features, similarities / overlaps and differences
5) Plenary discussion on most useful additional elements, stronger links or other further developments of the toolkits
6) Plenary voting on most inspiring picture created
7) Conclusions by the co-organisers

Key readings

Vogel, A. L., Hall, K. L., Fiore, S. M., Klein, J. T., Bennett, L. M., Gadlin, H., ... & Spotts, E. L. (2013). The team science toolkit: Enhancing research collaboration through online knowledge sharing. *American Journal of Preventive Medicine, 45(6),* 787-789.

Online introduction to td-academy.org https://td-academy.org/node/18

Bammer, G. (2018) Building a global community to improve how complex real-world problems are tackled. Integration and Implementation Insights blog, https://i2insights.org/2018/12/18/third-annual-review-2019/

Toolkits for Transdisciplinarity series, GAIA – Ecological Perspectives for Science and Society, www.oekom.de/fileadmin/zeitschriften/gaia_Grafiken/GAIA_Flyer_Toolkits.pdf

THE ROLE OF CO-CREATIVE PROCESSES TO FACILITATE CHANGE

Tuesday, 10.09.2019, 11h15 – 12h45
[Sydamerika]

Johann Rehnberg, Sophia Kaså
Mistra Urban Future, Gothenburg, network Go-Create
Keywords: facilitation, inclusion, perspectives, complexity, resistance

Most concurrent development process are characterised by complex issues, which naturally suggests transdisciplinary co-production of knowledge. Many groups struggle with this and tend to simplify complexity rather than stay aligned and reduce issues to a level where it's possible to make progress. From our perspective, a succesful approach includes aspects of inclusion, listening to all perspectives, dealing with resistance and conflict, and collaborative decision-making, with the overall aim of creating more sustainable results.

This workshop invites you to experience simple facilitated methods to explore perspectives on experiences and challenges when exploring complex issues, and additionally relate to a context of diverging and converging development.

The hands-on experience will combine tools and techniques to, in an initial 60 min exercise:

- make participants feel safe and comfortable with the subject of discusssion and each other
- facilitate initial dialogue based on suggested key perspectives
- facilitate dialogue on subjects with many perspectives, and various levels of resistance and/or conflict.

And, additionally, in the following 30 min presentation by the facilitators (and participants) relate the experience to:

- a "diamond" model that explains aspects of diverging and converging phases.
- a facilitator's approach of harvesting perspectives/valuable assets/keys to progress

The intention of the workshop is to allow the participants (and facilitators) to experience
co-creative dialogue when exploring issues of complexity, with diversity of perspectives, and maybe some level of stakeholder resistance. The objective of the workshop is to make "aha´s and oh-no´s", allowing the participants to become aware of their own role in co-creative processes; skills and competencies to lead processes, promoting collaborative learning etc.

The workshop will be facilitated by members of the Co-Create network, a network consisting of close to 50 persons involved in co-creative development processes, and hosted by Mistra Urban Future, Gothenburg.

DEVELOPING THEORIES OF CHANGE FOR SUPPORTING SUSTAINABILITY TRANSFORMATIONS: A SERIOUS GAME

Tuesday, 10.09.2019, 11h15 – 12h45
[Nordamerika]

Theresa Tribaldos, Flurina Schneider
Centre for Development and Environment, University of Bern
Keywords: scientific and societal networks, sustainability transformations, theories of change, serious game approach

Several networks of scientific and societal actors with different backgrounds and expertise aim at supporting sustainability transformations in their fields and topics. As different as these networks are in terms of working context, epistemological assumptions, visions and tangible goals, they also engage in different activities, target different audiences, and address different knowledge gaps. In other words, they point to different, often inexplicit, theories of change. Moreover, open questions remain about the ability and effectiveness of such networks to support sustainability transformations.

The goal of this workshop is to join different networks' perspectives and to develop building blocks of novel theories of change for the collaboration between scientific and societal actors at a network level. Theories of change are useful instruments for reflecting own activities, assumptions and expectations and relating them to specific goals and priorities (Mason and Barnes 2007)[1]. To develop theories of change that explicitly focus on the collaboration between science and society, we want to combine a serious game approach with design thinking. Serious games are defined as games that aim at specific learning outcomes while facilitating the learning process through ludic elements and thus creating highly appealing learning environments for the participants (Arnab et al. 2015)[2]. Design thinking is based on the idea to create solutions to complex problems through understanding, reframing and imagining new ways of addressing the previously unsolved issue[3]. A combination of these two methods will enable the participants to break through their existing thought patterns and widen their horizons for addressing sustainability problems.

This workshop addresses several of the questions in the conference stream societal transformations but specifically focuses on the question how different theories of change contribute to sustainability transformations.

Why is this workshop useful for sustainability transformations?

By joining different types of knowledge from science and society, the elaborated theories of change will be specifically designed to address the normativity and complexity of sustainability problems, while explicitly considering capacities and expectations from both sides. Reflecting on each other's theories of change and further developing them through innovative methods will help to better align own activities and objectives and to learn from others' experiences. Different backgrounds of the participants will broaden perspectives and the serious game approach in combination with design thinking will help to jointly develop creative new ideas for pursuing the own objectives.

This workshop fits well with the overall aim of the conference to join forces for change through bringing together different actors with different types of knowledge and expertise. The workshop will help to make their theories of change explicit and to further develop new ideas that can effectively contribute to sustainability transformations.

Methodology of the game

In a first step, we will explain the goal of the session and the rules of the game to the participants. In a second step, they will play the game in which they will discuss and create theories of change for different goals in groups of around five people. The games is played on a board in which the discussion moves from fields 1-5. Participants receive different cards with questions and instructions to guide the discussion. These are based on the principles of design thinking such as empathy, ideation and definition. The setup of the game will guide the participants through building blocks of theories of change and support their creative thinking. During the game, the participants are asked to write down the key points of their discussion in a theory of change map. In a third step, the participants will present their developed theories of change to the whole group and give feedback on their outcomes and on the process in general.

Inputs to the game are based on insights from the session organisers' research on theories of change in different research networks, various transdisciplinary research projects, and a literature review. We integrate these inputs with the participants' own knowledge, experiences and ideas, which are mobilised during the game.

We invite all participants who in one way or the other engage in research projects for sustainable development. A specific background is not necessary.

Agenda of the session

- Introduction to the game and the rules of the game
- Game session in groups
- Short plenary discussion on the developed theories of change

Session facilitators

This workshop is facilitated by Dr. Theresa Tribaldos and Dr. PD. Flurina Schneider. Theresa Tribaldos is a senior research scientist at the Centre for Development and Environment (CDE), University of Bern. She works in the project "Enhancing transformative research for sustainable development: mutual learning within research networks". In this project, she investigates transdisciplinary research approaches within research networks and the contributions science can make to sustainability transformations. She likes to explore innovative methodologies for engaging different types of actors in the knowledge production process.

Flurina Schneider is a senior research scientists and head of the land resources cluster at CDE. She is interested in the role of knowledge, knowing and learning in sustainability transformations and in the collaboration between academics and other societal actors for a more sustainable and just future. More specifically, she focuses on dialogue methods for reflecting on different actors' implicit assumptions and for jointly generating novel perspectives and ideas.

[1] Mason, P., & Barnes, M. (2007). Constructing Theories of Change: Methods and Sources. Evaluation, 13(2), 151–170. https://doi.org/10.1177/1356389007075221.

[2] Arnab, S., Lim, T., Carvalho, M. B., Bellotti, F., Freitas, S., Louchart, S., Suttie, N., Berta, R. and De Gloria, A. (2015), Mapping learning and game mechanics. Br J Educ Technol, 46: 391-411. doi:10.1111/bjet.12113.

[3] www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process

INTERDISCIPLINARY AND TRANSDISCIPLINARY 'FAILURES' AS LESSONS LEARNED

Tuesday, 10.09.2019, 11h15 – 12h45
[Asien]

Dena Monique Fam[1], Michael O'Rourke[2]

Institute for Sustainable Futures, University of Technology Sydney, Australia; [2]Center for Interdisciplinarity, Michigan State University, East Lansing, Michigan, USA

Academic literature is typically the home of research successes, i.e., reports from projects that yielded results worth disseminating. Research failures are less commonly published, even though there are arguably many more projects

that are dropped before they come to fruition. But cautionary tales about what one should avoid could prove remarkably valuable, especially when it comes to modes of research that are intrinsically complex.

Modes of research that involve the integration of different perspectives, such as interdisciplinary and transdisciplinary research in particular, are notoriously challenging for a host of reasons. Interdisciplinary research requires the combination of insights from different academic disciplines, and it is not uncommon that these disciplines have different epistemologies, with different types of data collected using different methods in the service of different explanations.

Transdisciplinary research as we understand it involves integration of non-academic stakeholder perspectives, such as NGOs, policymakers, and community members; in addition to any challenges that derive from the presence of different disciplinary experts, these projects confront large differences in the values, priorities, and cultures of the participants.

Documenting the detail of project failure matters – not only as an illustration of experienced challenges but also since projects do not always follow step-by-step protocols of preconceived and theorized processes. While these processes can be invaluable for guiding the development of complex projects, in reality practice may diverge from theory.

For the purposes of this workshop, we frame failure broadly. We will provide an initial characterization that involves interpreting the phrase "X failed" as "X didn't work as planned". Failures of this sort could be major and catastrophic, resulting in the end of a project, or they could be more minor, forcing revision in project plans. They can also happen at any point in a project, from the initial planning stage to the final, dissemination stage.

Of course, all projects require adjustments on the fly, and not all adjustments should be understood as failures. Modification in response to a failure, as opposed to a normal adjustment, will require that the project team attempted to execute a substantive project plan (e.g., write a proposal together, collect data together, collaboratively write a paper) and failed to execute it, resulting in a fundamental change to the plan. These plans are more than just "let's meet on Wednesday at noon", which would not count as a *substantive project plan*.

By framing failure broadly in this way, this workshop will provide the opportunity for participants to:

- Share both experiences and responses to failure in inter/transdisciplinary projects and
- Share anecdotes and approaches taken to rectify failures

This workshop will not be organised as a 'group therapy session' but rather an opportunity to share case studies illustrating 'failure' in a scholarly and safe space. In this workshop, we will be especially interested in the sort of project failure that consists in lack of success attributable to the complex, integrative character of the work. Failures like these can manifest in a variety of ways, including:

- Projects that did not get off the ground
- Projects that did not have the correct personnel for the project
- Projects that don't reach their original objectives but meet other objectives
- Projects that failed to anticipate important differences among the collaborators

Workshop design

The workshop will begin by broadly framing what the authors define as 'Failure' in interdisciplinary and transdisciplinary projects before providing an overview of preliminary findings from a survey conducted by the authors on *'Lessons learning in interdisciplinary and transdisciplinary projects'.* Preliminary survey results will form the starting point from which to explore participants own definitions of failure; experiences and responses to failure; and anaecdotes and approaches to rectify failure.

Structured activities

Participants will be interested (but not necessarily experienced) in failure in interdisciplinary and transdisciplinary projects/research and practice. We expect workshop participants to be practitioners, educators and/or researchers who believe that failure has the potential to manifest across these areas of practice and that there are lessons to be learned from it. The workshop will provide space for a broad range of perspectives while providing the opportunity to share experiences through individual reflection, small group discussion and whole group feedback sessions.

Workshop outcomes

The workshop will culminate in a synthesis of experiences and discussion points to be shared with participants post-workshop. This synthesis document will form the basis of an invited and co-authored publication with workshop participants on *'Learning through failure in interdisciplinary and transdisciplinary projects'.*

Tuesday, 10.09.2019, 14h00 – 15h30
PARALLEL WORKSHOPS III

ADVANTAGES AND CHALLENGES OF FACILITATION OF TD RESEARCH FOR URBAN PROJECTS
Tuesday, 10.09.2019, 14h00 – 15h30
[Europa]

Kerstin Hemström[1], Henrietta Palmer[1], <u>Siri Kjellberg[2]</u>, <u>Maria Helena Guimarães[4]</u>, <u>Roderick Lawrence[3]</u>, <u>Pia Andersson[5]</u>
[1]Chalmers University of Technology; [2]Lunds University; [3]University of Geneva & td-net, Swiss Academies of Sciences, Switzerland; [4]L'Instituto de Ciencias Agrarias e Ambientais Mediterranicas (ICAAM), University of Evora, Portugal; [5]Department of Sociology and Social Work, University of Gothenburg, Sweden
Keywords: facilitation, co-production, facilitation competencies and skills

Chair:
Roderick Lawrence, University of Geneva & td-net, Swiss Academies of Sciences, Switzerland.
Speakers:
Pia Andersson, Department of Sociology and Social Work, University of Gothenburg, Sweden.
Maria Helena Guimarães, LInstituto de Ciencias Agrarias e Ambientais Mediterranicas (ICAAM), University of Evora, Portugal.
Discussant:
Siri Kjellberg, Department of Human Geography, Lund University, Sweden.
Framing the Workshop
Facilitation is increasingly becoming recognized as necessary, especially in processes of co-produced TD research, as a means of integrating process design and methods to generate research outputs more reflective of our complex reality. There is no ideal or universal method for cross-fertilizing different worlds of knowing. Specific methods developed in one setting cannot merely be replicated and transferred to other research teams and contexts, in which the social composition and conditions for change are different. We acknowledge that tools and methods exist. However, they should be adapted to become suitable to the situation or problem addressed, and the specific characteristics of its context, including the group of participants in the research project.
In a recent TD-workshop (March 2019) performed as a collaboration between Cost Action INTREPID and the Urban Futures Open Research School (at Mistra Urban Futures Gothenburg Platform), skills and capacities of a facilitator for TD research were identified as follows: perspective awareness, capacity to link to daily life, conflict management, resource negotiation capacity, agility and creativity, capacity to 'connect the dots', etc. Building on this experience, we now invite participants to this workshop at the 2019 International Transdisciplinarity Conference to explore the role of facilitation and facilitation skills in transdisciplinary research for sustainable urban development. The idea of this workshop is to identify the advantages and challenges of explicit facilitation in transdisciplinary and participatory/community research based on experiences of transdisciplinary researchers who are trained in facilitation.
Navigating complexity in group collaborations – the roles of methods and facilitation (Pia Andersson)
There is great potential in approaches that function to facilitate the development and integration of complex knowledge. This talk will delineate some of my conclusions from facilitating group collaborations since 2006. My main aim has been to nurture and scaffold the joint complexity awareness and stakeholder awareness of participants engaged in collaborations of societal concern. In the process of knowledge development, both between stakeholders and within stakeholders, I have found that a facilitator can act as a support in phases where issues require understanding divergences and conflicts. This occurs while and by linking more perspectives about the issue and drawing on the whole group's understanding, even when the information appears contradictory or vague. By tracking the dialectics of the process and encouraging ways to link, and hence integrate information, I have

continuously found more complex action-logics emerge in groups. Conclusively, I will discuss the practical implications and challenges of this kind of facilitative approach.

Facilitating dialogue in research – the role of a transdisciplinary facilitator researcher (Mª Helena Guimarães)
This talk will summarize my research trajectory and explain when and why skilled facilitation became a defining skill in my academic career. The objective of summarizing this trajectory is to explain the advantages of skilled facilitation and how this competence can be an added value in research that focuses on social-ecological systems, changes, transitions, and sustainability. Sustainability as a research topic, or as societal challenge, implies provoking changes and dealing with transitions while being part of these change processes. In addition, the complexity of social-ecological systems is immense and the knowledge regarding their function is not enough to tackle the challenges humankind is facing. From my perspective, I will explain what is skilled facilitation (including the principals that guide my conduct), and I will explain how I organized a dialogue process and provide some examples of the methods and tools used (e.g. Q methodology, conceptual modelling, territory game, ice-breaking activities). Hence, I aim to contribute to a fundamental question in research about sustainability: How to organize collaboration, and how to promote active listening and responsibility.

Programme

00 - 10 **Welcome & Introduction to Workshop**
Framing & Purpose (cf. Thomas Jordan's paper)
Introductions of all participants
Chair: Roderick Lawrence, Swiss Academies of Arts & Sciences, & University of Geneva, Switzerland.

10 - 25 **Navigating complexity in group collaborations – the roles of methods and facilitation**
Pia Andersson, Department of Sociology and Social Work, University of Gothenburg, Sweden.

25 - 30 Questions of clarification

30 - 45 **Facilitating dialogue in research – the role of a transdisciplinary facilitator researcher**
Maria Helena Guimarães, Instituto de Ciências Agrárias e Ambientais Mediterrânicas (ICAAM), University of Evora, Portugal.

45 - 50 Questions of clarification

50 - 80 **Sharing experiences between participants**

80 - 89 **Synthesis of presentations and experiences:**
Is there a common-ground?
Discussant: Siri Kjellberg, Department of Human geography, Lund University, Sweden.

89 - 90 **Close of Workshop**
Next Steps.
Roderick Lawrence.

Key Reference:

Jordan, T. (2014) Deliberative Methods for Complex Issues: A typology of functions that may need scaffolding, G*roup Facilitation: A Research and Applications Journal*, No. 13: pp.50-71

We recommend that the advantages of facilitation can be discussed using Thomas Jordan's published article as guidance. In that article, Thomas proposed that the advantages of facilitation (not specifically with respect to urban projects) can be discussed according to 6 key issues:

1) Enabling attention support and group focusing (4 subcomponents).
2) Enhancing communication and interpersonal relationships (4 subcomponents).
3) Expressing personal attitudes, feelings and promoting group engagement (5 subcomponents).
4) Improving awareness and understanding while creating common-ground (6 subcomponents).
5) Promoting personal empowerment and mobilizing creativity (3 subcomponents)
6) Coordinating decision-making and implementation of desired outcomes (2 subcomponents).
7) Confronting Challenges

We recommend this frame because it focuses specifically on active facilitation processes rather than passive facilitation (such as the organization of spaces for group discussions); even though we realize passive factors are also important they will not be the main concern of this workshop. We have added a 7th topic in order to share experiences of how to confront challenges of facilitation.

DEVELOP YOUR OWN SCIENCE SHOP: A ONE STOP SHOP FOR PARTICIPATORY RESEARCH

Tuesday, 10.09.2019, 14h00 – 15h30
[Antarktis]

Helen Garrison
Vetenskap & Allmänhet
Keywords: collaboration; science shop; community-based participatory research; societal impact; co-creation

Science Shops are entities that bring researchers and civil society organisations together to co-create knowledge to better understand and solve societal issues. Through community-based participatory research in which local challenges are translated into research topics, Science Shops are a proven model for supporting transdisciplinary research that engages a range of stakeholders to achieve local impact.

The concept originated in the Netherlands in the 1970s and Science Shops can be found in countries around the world. Initially based within universities, Science Shops are now being run by different types of research organisations. SciShops is an EU-funded Horizon 2020 project testing new Science Shop models and developing tools and resources to support those interested in setting up Science Shops and community-based participatory research initiatives. Ten new Science Shops are being set up as part of the project by a range of different research organisations, including research institutes, NGOs, universities and companies.

This workshop will explore how Science Shops work, different organisational models and approaches based on real-life case studies, ways in which Science Shops can engage diverse stakeholders from different parts of society as well as challenges and success factors. Participants will come away with concrete ideas and tools for starting their own Science Shop projects.

Additionally, for sessions, workshops and training workshops: description of the session/workshop design

Introduction: Use of an interactive digital tool to find out participants' backgrounds and existing knowledge.

Overview of different models of Science Shops, looking at organisational models, funding, staffing, types of projects, illustrated through real-life examples.

Exercise 'Design your own Science Shop' - using the Science Shop Model Canvas (a tool developed by the EU SciShops project based on a business model canvas), participants will work in groups to discuss opportunities for Science Shops within their own organisations or communities.

After a brief introduction to challenges faced by Science Shops, groups will discuss solutions and opportunities. Handouts will be provided containing sources of further information and resources.

ENVISIONING CIRCULAR ECONOMIES– FUTURE WORKSHOPS AS A RESEARCH METHOD

Tuesday, 10.09.2019, 14h00 – 15h30
[Sydamerika]

Malin Henriksson[1], **Martin Hultman[2]**, **Jens Millkrantz[3]**
Swedish National Road and Transport Research Institute; [2]Chalmers; [3]Chalmers
Keywords: Circular economy, future workshop methodology, feminist ecology

In an ongoing research project concerning circular economy we bring together different actors, from grassroots initiatives and small-scale and growing enterprises to policy actors and researchers, in order to investigate what kind of transformative potential the notion of circular economy could have. The study will highlight initiatives that in creative ways challenge prevailing linear practices and strengthen the actors behind them. We will discuss findings from the study and explore different imaginaries of circular economy futures in interactive workshops.

In this proposed session we will invite the participants to imagine a circular economy future. Inspired by Bradley et.al. 2017, the purpose of the session is to test a workshop method for envisioning circular futures. We will ask question such as whom are included and excluded in such futures, and how future visions and scenarios can become more equal and just. We will apply a future workshop methodology which aims to engage different types of actors such as stakeholders, researchers, practitioners, policy-makers etc. (Wangel 2011). In the workshop we will together investigate different meanings of circular economy based on the settings in which the participants navigate, including matters of place and institutional context. The session will give rise to discussions about sustainable and circular futures from which the participants can bring ideas into their own activities.

The workshop starts out with a mapping of circular practices today which will be related to the Swedish policy arena and will include different aspects and include a transdisciplinary perspective.

Secondly, the participants are asked to contribute with own ideas and reflections with the aim to widen the circular policy agenda.

Third, the participants will pinpoint the most important notions of a just circular future.

Key readings

Bradley, K.; Gunnarsson-Östling, U.; Schalk, M. (2017) feminist political ecology: rewriting Stockholm's vision 2030. In Feminist Futures of Spatial Practice: Materialisms, Activisms, Dialogues, Pedagogies, Projections / [ed] Meike Schalk, Thérèse Kristiansson, Ramia Mazé, Baunach DE: AADR / Spurbuchverlag , 2017, pp. 301-327

Wangel, J. (2011) *Making futures. On targets, measures and governance in backcasting and planning.* KTH Architechture and the Built Environment. (diss.)

EXTENDING THE OUTCOME SPACES FRAMEWORK (OR OSF+): A WORKSHOP FOR PRACTITIONERS TO EXPLORE PLANNING FOR OUTCOMES IN TRANSDISCIPLINARY RESEARCH

Tuesday, 10.09.2019, 14h00 – 15h30

[Nordamerika]

Melissa Robson-Williams[1], Ronlyn Duncan[1], Dena Fam[2], Cynthia Mitchell[2]

[1]Manaaki Whenua Landcare Research, Lincoln, New Zealand; [2]Institute for Sustainable Futures, University of Technology Sydney, Australia

Rather than focus on inputs and/or the process for inter or transdisciplinary research, the Outcome Spaces Framework (OSF) begins at the end by seeking to plan for outcomes at the beginning of a project. Thinking through at the outset what might need to be done to actually deliver desired or promised outcomes has important implications for how transdisciplinary research is designed, undertaken and evaluated.

A workshop on the OSF was held at ITD in 2015. The focus then was on three outcome spaces, namely: 1) improving the situation 2) contributing to knowledge stocks and flows; and 3) mutual and transformational learning by researchers and research participants (see Mitchell, Cordell and Fam, 2015).

Since then, a number of innovations to the OSF have been tested in New Zealand with lead researchers from a selection of its mission-led outcomes-focused National Science Challenges* (OSF+). For example, OSF+ was found to be highly useful as an evaluation tool and for comparing intended, actual and desired outcomes. Being able to visualise a sequence of changing outcome spaces profiles that illustrated where efforts and resources were expected to be directed, where they ended up and where they needed to go in the future was identified as a particularly powerful feature. Coupled with separating knowledge stocks from knowledge flows, OSF+ was also found to reveal implicit theories of change at the programme, project and researcher levels which was also recognised as a compelling feature of the model.

Workshop design

This workshop is open to all transdisciplinary practitioners, especially those that might have used the OSF. We ask participants to come along with an existing, ongoing or complete project or programme in mind and some pre-thinking about how you might (broadly) populate the outcomes spaces set out above. The workshop will begin by briefly explaining the Outcome Spaces Framework and then the variations drawn from the New Zealand work (i.e. OSF+).

Structured activities

The workshop will involve structured activities for participants to map out the profiles of outcome spaces for individual projects across the intended, actual and desired sequence. We will be seeking discussion and feedback from participants from reflections on the theories of change that connect the outcome spaces of the different profiles.

Workshop outcomes

The workshop will culminate in learning about the OSF and OSF+ and other innovations participants contribute, how various versions can be used as an evaluation tool and how the framework can be used to identify theories of change.

If there is sufficient interest, we would also envisage working with participants to use what comes from the workshop to extend OSF and OSF+ to other contexts and identify new ways of working with it which could be synthesised for use within and beyond the academic literature.

Agenda

1) Introductions and purpose of workshop
2) Overview of the Outcome Spaces Framework (OSF)
3) Overview of variations to OSF drawn from New Zealand (OSF+)
4) Activity introduction and points of clarification
5) Work through activity (approx. 30 minutes)
6) Reflection on activity: what was useful, what was missing, what improvements might be needed? (approx. 30 minutes)
7) Wrap up

New Zealand's National Science Challenges are expected to fundamentally change how science is done in New Zealand to address long-term complex issues such as climate change, biodiversity loss, better homes and ageing well. Having completed their first five years of research, the Challenges are now moving into their second phase which provided an opportunity to present the OSF as a potential evaluation tool to Challenge lead researchers.

Reference

Mitchell, C., Cordell, D and Fam, D. 2015. Beginning at the end: the outcome spaces framework to guide purposive transdisciplinary research. *Futures,* 65: 86-96.

THE TRANSDISCIPLINARY "DELTA-ANALYSIS" AND SYSTEM INNOVATION PROCESSES TOWARDS SDG´S

Tuesday, 10.09.2019, 14h00 – 15h30
[Asien]

Silke Kleihauer[1,2], Martin Führ[1,2], Julian Schenten[1,2]
[1]University of applied Siences Darmstadt, Germany; [2]Society for Institutional Analysis (sofia)
Keywords: delta-analysis, actor orientated incentive and impediments, scenario processes, role play, problematic chemical substances in consumer articles

At the post-Rio summit 2002 in Johannesburg the international community agreed to a set of goals addressing the adverse impact of problematic chemical substances. In 2015 the UN under the title "Transforming our world: the 2030 Agenda for Sustainable Development" adopted the 17 Sustainable Development Goals (SDG´s). The "Johannesburg goals" were incorporated into SDG 12 "Sustainable production and consumption patterns" (Schenten/Führ 2018). In particular SDG 12.4, to be achieved already in 2020, asks for the "sound management of chemicals and all wastes throughout their life cycle […] and significantly reduce their release to air, water and soil in order to minimize adverse impacts on human health and the environment". Against this backdrop, new patterns of interaction along the globally organized supply chains have to be established. To this end incremental improvements will not succeed; rather, a broader perspective (also known as "system innovation") is needed covering the interplay of technical, social and organisational innovations underpinned by an amended institutional framework. The latter includes formal and informal norms on different layers: a societal (macro) level as well as organisational (micro) and an inter-organisational (meso) level.

In terms of the sound management of chemical substances and the risk related to them it is essential to close the knowledge gaps by generating new (eco-) toxicological data; in the global supply chain they have to be (electronically) communicated from one tier to the next and new means of cooperative risk reduction strategies have to be envisaged triggered by a legal framework fostering a "greener chemistry". In addition, it has to be assured that the latest findings from academic research are taken into account.

Transdisciplinary projects aims at contributing to the related change processes. In this respect the workshop offers a **"transformative methods clinic"**. A case study illustrates the transdisciplinary "delta-analysis" combined with a stepwise process triggering individual and organisational learning towards solutions contributing to innovations towards the SDG´s by means of a "transment" (see below).

In a methological perspective the workshop addresses three different layers:

Firstly, the participants are briefly familiarized with the research approach "interdisciplinary institutional analysis" (Bizer/Führ 2015) which is based on the methodological individualism enriched, i.a., by social-psychological insight, the *homo oeconomicus institutionalis*. This approach reflects the fact that every change process has to be enacted by a specific set of human actors who are influenced by individual incentives and impediments but also by their patterns of perception und habitual behaviour.

Secondly, transdisciplinary projects – and in particular those with a normative intention, such as transformation towards the SDG´s – benefit from a specific stepwise approach (illustrated in the case study):

The initial step (A) not only establishes a common "problem" understanding of the "boundary object" but also explicitly formulates a set of research/transfer questions structuring (B) the co-design and pre-test of technical, social and organisational innovations and the related institutional amendments leading (C) to a "roll out" contributing to societal transformation.

This approach allows mobilizing the – sometimes tacit – knowledge of the different actors. The project setting in steps A and B can be described as "*transment*", a term linking *trans*disciplinary *trans*fer and *trans*formation with the testing approach of an experi*ment*.

In a meta-perspective, thirdly, experience shows that a major challenge in transdisciplinary processes can be described as "actor quality": more often than not problems in this respect occur on the side of the researchers. In contrast the "actor quality" on the side of the practitioners is largely influenced by the perceived benefits of the envisaged change processes; in a nutshell by the (mid- or long-term) business cases.

The workshop is divided in three sections (approx. 20 min./45 min./20 min.)

- It starts with a "case study" exemplifying transdisciplinary research methods which have been successfully applied in a project with practitioners from various tiers of the textile and sporting goods supply chain (SuSport) based on a 2030 scenario process. It triggered, i.a., a cross-sectoral group of global players aiming at a global standard to report on chemical "substances in articles" (proactive alliance) with the long term perspective of a "full material declaration" (FMD).
- A "transment lab talk" offers the opportunity to share experiences and exchange views on the different steps in transdisciplinary processes; starting with the challenge to gain a common understanding of the problem to be addressed and the subsequent "core question" and not ending with designing and testing an appropriate solution (= transment steps).
- Finally the participants formulate their insights; both with regard to their actor perspective in transdisciplinary processes and to the methodological challenges in these processes.

The workshop intends to share experience among the participants on success factor of research and transfer projects contributing to SDG-orientated system innovation. The workshop format can be described as **"transformative methods clinic"** addressing the following questions:

- What are the key project design elements fostering collective learning cycles not only between scientists and practioners but also among the different actors in both groups.
- Which experiences the participants have gained with regard to exchange and collaborations formats and their impacts on the capacity of the actors ("actor quality") to contribute to the transdisciplinary and transformative process?
- How **to create a "momentum for change"** and to which extent the (expected) legal framework and other external institutional arrangements (fostering, e.g., collaboration of actors on a meso-level) contribute to the willingness for change?

Key readings

Results of the 2030 scenario process in the transdisciplinary SuSport project (also summarized in a video, 3:26)–

> **"UNEP Status Report on SDG 12: Textile Industry in 2030"**
>
> Scenario story, version 1: "muddling through"
>
> Scenario story, version 2: "boldly ahead"

Bizer, Kilian/ Führ, Martin 2015: Compact Guidelines: Practical Procedure in Interdisciplinary Institutional Analysis, sofia discussion papers on institutional analysis No. 15-4, Darmstadt 2015
ISBN: 978-3-941627-45-1

Schenten, J./Führ, M. 2018_ Sustainable Production and Consumption (SPC), in: Krämer, L. & Orlando. E. (Hrsg.), Encyclopedia of Environmental Law - Principles of Environmental Law. Cheltenham: Elgar.
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PARALLEL WORKSHOPS IV

TOWARDS THE ESTABLISHMENT OF A NEW TRANSDISCIPLINARY AREA OF SCHOLARSHIP IN INFRASTRUCTURE AND CITIES

Tuesday, 10.09.2019, 16h00 – 18h00
[Europa]

Joanne M Leach[1], Chris D F Rogers[1], Paul Jeffrey[2], Colin Taylor[3], Tom E Dolan[4], Chris I Goodier[5], Katherine Adams[5]
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Keywords*: Infrastructure, Cities, Systems, Cross-sector, Cross-disciplinary

"The term 'interdisciplinarity' is used to cover a diversity of practices. What is crucial for one kind of interdisciplinarity may be immaterial to another." *Bammer, G., 2015. Interdisciplinarity: Less vague please. Nature, Volume 526, p. 506.*

Participants in this workshop will pressure test a new characterisation of transdisciplinarity that is positioned as the first step in developing a framework for fostering transdisciplinary approaches to the opportunities and challenges posed by infrastructure and cites. Transdisciplinarity produces new knowledge and innovations by integrating scientific and extra-scientific insights. It is well positioned to establish novel and new connections between the many and varied domains, disciplines, perspectives and practices that make up infrastructure and urban systems.

The proposed transdisciplinarity characterisation is applicable across practice and academia and is of interest to those advancing a paradigm shift in approaches to planning and managing infrastructure and cities: how they are conceived, funded, organised and executed. Transdisciplinarity has the potential to advance this paradigm shift, but transdisciplinary manifestations are heterogeneous and context dependent, making them difficult to apply. The characterisation identifies target areas for enabling, facilitating and embedding transdisciplinary thinking and practices; such as, problem framings, skill sets, methodological and communication 'distances', accountability, quality control, governance and processes. Workshop participants will grapple with how such 'points of entry' can be made operational.

Additionally, for sessions, workshops and training workshops

Duration: 90 minutes
Presentation: A total of 20 minutes of presentation
See below for details
Overview:

The workshop will familiarise participants with a new characterisation of transdisciplinarity and will explore making it operational. The characterisation identifies 'points of entry' for enabling, facilitating and embedding transdisciplinary thinking and practices in approaches to planning and managing infrastructure and cities.

Agenda summary:

- Welcome and introductions (15 minutes)
- Overview of the transdisciplinarity characterisation + Q&A (30 minutes)
- Refining the characterisation (20 minutes)
- Understanding the potential value of the characterisation (15 minutes)
- Identifying next steps (10 minutes)
- Close

TRANSFORMATIVE LEARNING ACROSS THE LIFESPAN: THE POTENTIAL OF NEW TRANSDISCIPLINARY LEARNING FORMATS LINKING PERSONAL DEVELOPMENT, PROFESSIONAL UPSKILLING AND SOCIETAL TRANSFORMATION

Tuesday, 10.09.2019, 16h00 – 18h00
[Antarktis]

Björn Müller[1,5], Ruth Förster[1], Aleksi Neuvonen[2], Miikka J. Lehtonen[3], Marea Hildebrand[4]
[1]Stride unSchool; [2]Demos Helsinki; [3]Aalto University School of Business & School of Arts, Design and Architecture; [4]School of Commons // Zurich University of the Arts; [5]University of St. Gallen
Keywords: Collaborative learning, Lifelong learning, Transformative learning, Employability, Social Innovation

Lifelong learning has always been conceived as a triadic endeavor, aspiring to be functional on a personal, organizational / economic and societal level (Aspin & Chapman, 2000). When the EU once refashioned education and training as "highest political priorities" (EU, 2002, p. 4), an integral vision for lifelong learning was put forth, aiming at the "personal development of all citizens" and the "participation in all aspects of society from active citizenship through to labour market integration" (p. 4). Under the conditions of the learning economy within a knowledge society, lifelong learning has yet turned mostly into a political program overemphasizing or even exclusively promoting the singular instrumental function of securing the employability of an aging workforce (Biesta, 2006). Once envisioned as a societal project and a right, lifelong learning has become understood as an individual task and a duty. From a perspective of societies in transition that face complex societal challenges, among others an eroding democracy itself, framing lifelong learning narrowly in economic terms is a casualty and a lost opportunity: by producing technically skilled human capital instead of empowering educated and engaged participants in public life, a narrow vision and form of lifelong learning is threatening democracy and the much needed involvement of innovative citizens in the massive transformation of our societies.

Reclaiming the triadic nature of lifelong learning requires conceptual development, concrete case studies and new operational models. While primary, secondary and higher education have been targeted by transformative educational concepts like 'Global Citizenship Education' (e.g. Pigozzi, 2006) and 'Education for Sustainable Development' (e.g. Huckle & Wals, 2015), there is comparably little conceptual work on the potential of lifelong learning for societal transformation (see Hof, 2017). In this workshop, echoing Biesta's (2006) urgent call to "reclaim the democratic dimension of lifelong learning" (p. 178), we build on a number of promising developments, both in theory and practice that foreshadow new integrative forms of lifelong learning.

The contributors of this workshop provide different case studies, questions and hypotheses in order to co-create an outline of transformative lifelong learning regarding:

- its potential contribution to and role within societal transformation;
- its methodological innovations, including its characteristic environments, pedagogies and ways of learning, documenting and communicating;
- its (institutional) structures and and operational / business models;
- its legitimization and attraction for others (colleagues etc.) to join such forms of teaching / learning.

This session serves as a first meeting and dialogue moment for a growing group of educators and researchers working on transformative learning and/or lifelong learning concepts and formats within adult education. We see this as a promising venue and format for a) allowing relevant actors from different research traditions inside and outside academia to network; b) connecting to the TD community; c) preparing for further professional activities in the future (conference, publication, pilots...).

Individual contributions

The following authors will be presenting case studies - from their own real-life laboratories - and / or conceptual work.

Björn Müller: "'We are not students!' Unschooling social innovators through democratic co-creation"

A small but growing number of transdisciplinary business / entrepreneurship / innovation programs is spreading around Europe. *Stride unSchool*, a private Swiss lifelong learning provider, serves as a case study on how the personal, economic and democratic purpose of lifelong learning can be realized within a transformative learning frame. Sharing insights from the first two years of running a continuous learning program for social innovators, called 'unDiploma for Collaborative Leadership & Social Innovation', two developments are emphasized: first,

understanding and enabling lifelong learning as part and parcel of 'social innovation' projects; secondly, to conceive of lifelong learning less as 'learning for earning' but as an ongoing form of Bildung and 'transformative learning' (see Laros, Fuhr & Taylor, 2017). The central questions raised by the case study:

- What are the possibilities and requirements of transdisciplinary (non)pedagogies and formats of co-creation that cast aside the traditional divide between learning and working?
- How can we open up and hold the space for relevant and big questions - both personally and societally?
- How can transformative lifelong learning actually contribute to social innovation within a democratic and citizen-oriented process of co-creation (see Müller, 2018)?

Aleksi Neuvonen: "The role of universities in turning lifelong learning into citizenship education: findings from Finland"

Through the first half of the 20th century, universities were thought to have a crucial role in building educated, civilized nations. Universities shaped the surrounding society in diverse ways, yet the most important vehicle of change came in the form of educated people who served in various positions in society and often possessed superior capabilities compared to non-educated peers due to their enhanced access to information. With the emergence of an innovation-driven economy and a shift in the academic world towards international publishing and international academic careers, the position of universities within societies has changed: science and university education are expected to provide clear, measurable economic impetus meanwhile their transformative potential is being discussed less frequently.

Discussion on the future of work and anticipations on the accelerating speed of reshaping jobs and professions has created a new sense of urgency to define the role of universities in lifelong learning. However, this discourse assumes largely the late 20th century approach to universities and their societal role, while neglecting a large part of the transformative potential of academic institutions they once had. After all, the on-going transformation in our societies extends much beyond changes in skill sets needed in professional life and employment. Therefore we should dare to ask very fundamental questions regarding the role of universities in the unfolding system of lifelong learning: How could universities regain the transformative role in society they once had? How could universities obtain an approach to lifelong learning that emphasises meta-skills like curiosity and collaboration? What are the new relationships between universities and surrounding society that programs focusing on lifelong learning are bringing about and how are they to transform universities as platforms of collaboration and emergence of new ideas and practices?

The presentation is based on a vision paper on the position of universities in the 2020s written for the ministry of education and culture of Finland in winter 2019.

Questions:

- How are universities taking their role in lifelong learning as providers of transformative skills key for the post-industrial, digital and global era?
- How are universities changing as places of learning when re-focused towards central capabilities for a transformative period full of uncertainty and emergence?
- What will differentiate universities in the context of lifelong learning from other providers of education?

Miikka J. Lehtonen: "Overcoming design dyslexia: blending boundaries through design for embodied learning experiences"

During the last decade or so, design has been gaining currency in neighboring as well as more distant disciplines as a source of catalyst for innovations, new competitive advantages, or new ways of collaborating across disciplines. In essence, through what has been coined as *design thinking*, people outside design have been exposed to designerly ways of working. Whilst not questioning design's potential, we do ask, what do we teach when we teach design to non-designers? Or more broadly, what can design bring to the table when it comes to transforming societies through learning? Drawing on our experiences from the *Nordic Rebels* movement, we will introduce one of our courses during which students work in multidisciplinary teams to identify and tackle problems in the surrounding society with the help of design.

Questions:

- How might we document pedagogical explorations such as Nordic Rebels to support others in creating meaningful learning experiences?
- Co-learning with the society is definitely a fruitful avenue to explore further, but how might we transport pedagogical innovations created in universities to corporate environments, for example?

- Since we are talking about transforming societies, how do we ensure pedagogical innovations feed into universities' strategic goals? That is to say, how do we ensure our work is not seen as a publicity stunt but as a driver for strategic change in and outside universities?

Marcel Grissmer, Marea Hildebrand: "School of Commons: explorative learning in-between grassroots research, art and social innovation"

The public debate concerning the future of higher education has been heated up recently, due in large part to an array of societal developments such as the neoliberalization of scientific research, market interests arranging access and content of institutionalized education and the general international streamlining of curricula in institutions of higher education. These developments have the effect of further marginalizing unsanctioned forms of knowledge and knowledge production. One form of countering these tendencies are self-organized platforms in parasitic relationship to established host institutions facilitating transdisciplinary study, research and knowledge creation. The School of Commons is a laboratory associated with the Zurich University of the Arts in which forms of learning and teaching are experimented with and in which non-standard methods and approaches can be developed. A significant share of the contents within the project are developed by "grassroots research"- any form of systematically and methodologically informed study of self-chosen and clearly outlined insight interest, independent of the chosen means, interest foci or form of results. Keeping the autonomous structure of grassroots research in mind, we ask:

- How can the exchange between different groups and interests be facilitated and how can results and processes be shared and archived?
- How can non- and transdisciplinary study be nurtured in an institutionalized setting without being co-opted by the host institution and remaining accessible to non-affiliated persons seeking out independent spaces of learning?

Workshop design

The 120 minutes workshop is formatted as a design-based co-creation. Inputs of the presenting authors in the form of case studies, questions and hypotheses will serve as basis for jointly discovering and defining relevant challenges on conceptual, methodological and institutional / societal levels. Subgroups formed around shared interests will then work creatively on first ideas and solutions. The authors / organizers of the workshop are well versed in creative methods and will employ embodied creativity methods that explore a given problem through visual art, movement, and/or creative writing individually and in groups, to catalyze diverse and innovative solutions.

Literature

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TOUCHING THE INTANGIBLE: USING IMAGE THEATRE AS AN EMBODIED METHOD TO ACCESS DEEP LEVERAGE POINTS IN INTER- AND TRANSDISCIPLINARY RESEARCH

Tuesday, 10.09.2019, 16h00 – 18h00

[Sydamerika]

Sadhbh Juarez-Bourke

Leuphana University of Lüneburg

Keywords: Knowledge-integration, aesthetics, embodied knowledge, Freire, Image Work

Integrating knowledge from different sources requires the ability to appreciate the value of different types and ways of knowing, which often stem from different ontological beliefs. While developing a joint language is a key step for successful inter- and transdisciplinary endeavours, deep transformation requires engaging our affective as well as cognitive abilities. Finding ways to negotiate different values, identity and affective needs can be challenging in academic settings, in which rationality is the means to mediate different perspectives. In this context, aesthetics can offer us an entry point to access these deeper leverage points. Needs, fears and desires act as drivers and barriers for both personal and collective transformations. Aesthetics offer a "safe space" in which our more vulnerable selves can be explored, expressed and collectively transformed. In this workshop, participants are introduced to the theory and practice of Image Theatre, in which we us the body as the mediator between our cognitive ideas and our emotional world. Through the co-creation of aesthetic images, we produce metaphors that help us to talk about and explore the non-tangible dimensions of a concept, and find ways to connecting to the *other*. The method is based on the techniques of theatre pedagogue Augusto Boal and Paulo Freire´s critical theory, developed throughout the 70s and 80s in Latin America, which are revisited here in the context of sustainability transformations.

Workshop Design

The workshop is designed in three parts. The first fifteen minutes of the workshop will be dedicated to an introduction to roots and theoretical foundations of the method, and sharing some examples of how it has been applied in inter- and Transdisciplinary case studies. For the following hour, participants will be accompanied through a series of steps to transition from a cognitive to an aesthetic space. After de-mechanising the body with a series of warm-up exercises, we learn how to distinguish between the "image of reality" and the "reality of an image". It is at the in-between space that separates objective reality and interpretation, that we find doorways for transformative action. Each activity is followed by a space for reflection to draw meaning from the experience. During the last thirty minutes of the workshop we reflect back on the methodology, its applicability in different contexts, contribution to an epistemology for transdisciplinary research, and the opportunities and challenges it presents for inter- and transdisciplinary research endeavours.

URBAN LIVING LABS: EXPLORING POSSIBLE SOLUTIONS TO THE VARIOUS CHALLENGES OF PARTICIPATION

Tuesday, 10.09.2019, 16h00 – 18h00

[Nordamerika]

Selma L'Orange Seigo[1], **Matthias Probst**[1], Michael Stauffacher[1], Yann Blumer[2], Evelyn Lobsiger-Kägi[2]

[1]ETH Zurich; [2]ZHAW

Keywords: Living labs, Reallabor, participation, non-participation, co-creation

Living labs are transdisciplinary initiatives that serve as a '*forum for innovation, applied to the development of new products, systems, services, and processes in an urban area; employing working methods to integrate people into the entire development process as users and co-creators to explore, examine, experiment, test and evaluate new ideas, scenarios, processes, systems, concepts and creative solutions in complex and everyday contexts*[1]'. In German speaking countries, the concept of real-world labs (*Reallabore*) has gained a lot of traction recently and shares most of living labs' core characteristics.

A key element of these *Reallabore* are participatory processes that allow for the integration of the expertise, tacit knowledge and needs of residents and other stakeholders. However, participation is by no means a panacea for creating successful living labs. Particularly on a practical level, there are a number of challenges concerning the

organization of participatory processes. These concerns, inter alia, the function (instrumental, substantive, normative), the form, the timing, the duration and frequency of participation, the willingness to delegate decision-making power as well as – often most importantly – the issue of non-participation. This can on the one hand refer to people that are not able to participate (e.g. through language barriers) and that thus are excluded by the participation design. On the other hand it may refer to individuals that choose not to participate, which may be for a number of reasons (lack of interest, other priorities, etc.). Either way, non-participation may challenge the inclusiveness and legitimacy of a living lab. At the same time, it narrows the views and expertise that are tapped into by a participatory process.

The living lab that the authors work on is a neighborhood in Zurich, Switzerland. It is a housing development by a cooperative ('mehr als wohnen'/'more than housing') that was created as a lighthouse project in terms of sustainable urban living, and is home to almost 1300 people. The goal of our living lab is to foster sustainable behavior, with a focus on food-related behaviors. In a short input, we will share some of our insights and problems we have encountered during the past 2.5 years, with an emphasis on participation and non-participation. We will focus especially on the various forms of participation that we have applied both in designing and implementing our concrete interventions about daily food practices of residents. We detail, inter alia, how we use classical workshop formats but also tools from design thinking and more classical social research methods to increase diversity of participation and thus inputs. In our experience, one of the core challenges is to reach the 'right' people and to govern participatory processes alongside other informal or formal kinds of participation that happen in parallel, but are organized by the housing cooperative and active resident groups. Across all these initiatives, we often encounter the same group of people, who tend to be highly educated Swiss or Germans. There are, however, 26% residents with other nationalities, and in terms of education, the neighborhood is representative for the canton of Zurich (i.e. only about half of the population has some sort of higher education). This begs the question who the non-participants are, and why they do not participate. Do they not know they could participate? Do they not want to? Do they not feel they can contribute? In short: what are the main barriers that prevent a more diverse group of people from participating? And how could these barriers be overcome?

From personal exchanges with other urban living lab researchers, we know that they face similar challenges. We therefore want to explore possible solutions or promising strategies to improve the quality and quantity of participation in living labs. The target audience of this workshop are researchers and practitioners who work with living labs, but also researchers who are interested in participation more generally.

We ask participants who plan to attend our workshop to prepare some input for the second phase, when we collect challenges with participation that researchers have. Please write down a problem you have encountered (e.g. "with events of type X we can only reach women", "language barriers reduce diversity", etc.) and bring it to the workshop (we will also offer the possibility to write down statements immediately before the start of the workshop). The idea is to speed up the problem analysis and leave more room for the development of solutions.

The workshop will consist of the following phases:

1) (Short) **Input** on the experiences and challenges concerning participation in the 'more than housing' lab following a story telling format
2) **Validation and supplementation** of these experiences and challenges by the expertise of the participants, drawing on the learnings from their respective labs (using input prepared by participants)
3) **Exploration** of practical strategies to address these core challenges in smaller groups (using tools from design thinking)
4) **Prototyping** of these strategies in smaller groups again to "try out", test and further refine some of the solutions, for example by roleplaying
5) **Synthesis**: The workshop will be wrapped up by a discussion of the main findings and potential follow-ups (further workshops, training courses for living labs, joint publication)

References

1 (JPI Urban Europe, https://jpi-urbaneurope.eu/app/uploads/2018/01/Urban-Living-Labs-info-sheet-draft-171123-version-8.2-PRINT.pdf).

WHICH RESEARCH APPROACH SHOULD I EMPLOY IN MY RESEARCH PROJECT? DEVELOPING CRITERIA-BASED GUIDANCE ON CHOOSING THE MOST APPROPRIATE RESEARCH APPROACH AMONG TD CASE STUDY, LIVING LAB, ACTION RESEARCH, URBAN TRANSITION LAB, REAL-WORLD LAB, APPLIED DISCIPLINARY RESEARCH, AND OTHERS

Tuesday, 10.09.2019, 16h00 – 18h00
[Asien]

Michael Rose[1], Annaliesa Hilger[2], Matthias Wanner[3], Tom Dedeurwaerdere[4]
Leuphana University Lüneburg; [2]University of Wuppertal; [3]Wuppertal Institute for Climate, Environment and Energy; [4]Université catholique de Louvain

TD Trends and Tenders and Growing Diversity

The transdisciplinary and transformative research landscape is becoming increasingly colourful. Especially research approaches that include real-world interventions or experiments to facilitate real-world changes have been in vogue for some years now. This is, for example, reflected in the growing number of established Real-World Laboratories as well as in numerous proposals for fleshing out new research formats. Many of these contributions stipulate a co-leadership of non-scientific and scientific actors as well as the joint definition of a topic, frequently including the guiding question. In contrast to 'conventional' TD research approaches, implementing and accompanying interventions or so-called real-world experiments are discussed as a stand-alone feature in these 'newer' research approaches. This diversity contributes to a new convolutedness of the field. It is increasingly challenging to maintain an overview and not to be guided primarily by trends and tenders when deciding on a research approach.

Call for Systematic Orientation

Therefore, the workshop aims to discuss which criteria help to decide which of those approaches is the most appropriate one for a research project. The workshop will bring together experts from the community on conceptual work and empirical analysis of different transdisciplinary and transformative research approaches, as well as action research and applied disciplinary research. Taking intervention-based approaches (e.g. Urban Transition Labs, Real-World Laboratories and Living Labs) as a starting point, the workshop aims for a comprehensive multi-criteria table offering guidance for scholars and practitioners looking for appropriate research approaches for their specific purposes. The workshop thereby addresses the conference's methodological innovation stream, contributing, inter alia, to the question of how different types of transdisciplinary pedagogies, research methods and processes of co-production can be developed to more effectively contribute to societal transformations.

(Mis)Matches between Research Problems, Goals, Conditions and Chosen Approaches

A carefully considered decision on the most appropriate research approach is essential: For instance, the research practice of Real-World Laboratories place extensive demands on all actors involved and is characterised by a highly resource-intensive operation whose progress and outcomes are by definition variable and impossible to plan comprehensively. In addition, institutional, personnel, time and financial framework conditions can enable or hamper a long-term successful joint work of practice and science at eye level; also, the specific goals pursued should play a decisive role when deciding on a project's research approach. Equally, the nature and complexity of the initial problem is important: Neither a research gap without direct reference to 'real-world problems' nor an inherent deficit in implementation as such require the choice of the Real-World Laboratory approach. It also does not seem to be appropriate, for example, to set up a Real-World Laboratory if the intervention cannot have an innovative character due to high risk aversion among the participating actors.

The example of Real-World Laboratories shows that many factors need to be considered when choosing the right approach from the highly fragmented transdisciplinary and transformative field. Against this background, we ask what exactly constitutes the various types of collaborative research approaches and propose a preliminary matrix that can guide decisions on whether or not to design an application-oriented research project as a particular type.

Workshop Design

Aims

- To identify factors that guide the selection of the most appropriate research approach

- To systematically discuss similarities and differences of transdisciplinary and transformative research approaches regarding these factors
- To work with the workshop participants' expertise and experiences in respective research approaches
- To further develop and multi-perspectively validate a comprehensive 'matrix'
- Workshop results may feed into the development of a decision tree and a joint publication

Targeted Participants
- Experienced researchers and practitioners interested in and familiar with empirical sustainability research and research designs
- We seek a comprehensive bandwidth, including among others applied disciplinary research, TD Case Studies, Living Labs, Urban Transition Labs, and Action Research
- Scholars and practitioners with a special focus on intervention-based collaborative research processes are particularly welcome

Agenda
- Welcome & getting to know each other
- 15min presentation of a first rough draft matrix with possible dimensions and criteria that may guide the description and selection of appropriate research approaches
- Individual and group work to validate, falsify or amend the criteria and dimensions
- Short break
- Group work to apply the criteria to each research approach and fill in the respective values
- Concluding discussion

Organisational Notice: Do not hesitate to bring your mobile device (notebook etc.) to participate in digital collaboration.

Key Readings

Schäpke, N.; Stelzer, F.; Caniglia, G.; Bergmann, M.; Wanner, M.; Singer-Brodowski, M.; … Lang, D. J. (2018). Jointly experimenting for transformation? Shaping real-world laboratories by comparing them. *GAIA - Ecological Perspectives for Science and Society*, 27(S1), 85–96.

Wanner, M.; Hilger, A.; Westerkowski, J.; Rose, M.; Stelzer, F.; Schäpke, N. (2018). Towards a Cyclical Concept of Real-World Laboratories: A Transdisciplinary Research Practice for Sustainability Transitions. *DisP – The Planning Review* 54(2), 94–114.

Tuesday, 10.09.2019, 18h00 – 19h30

WELCOME RECEPTION

[Foyer/Lobby]

Drinks and snacks will be provided.

PLENARY I

PLENARY I: SOCIETAL TRANSFORMATION
Wednesday, 11.09.2019, 08h40 – 10h20
[Wallenbergsalen]
Mikael Cullberg[1], Cynthia Mitchell[2], Dena Fam[2]
[1]Head of County Governors office at County Administrative Board of Västra Götaland, Sweden
[2]University of Technology Sydney, Australia

Keynote I: Public Sector Perspectives on Societal Transformation and TD
Mikael Cullberg, Head of the Governor's Chancellery at the Swedish County Administration Agency

This presentation offers a public sector perspective on societal transformation and trans-disciplinarity. It is based on the experience of Mistra Urban Futures over more than ten years, including the pre-start-up phase: Mikael was the County Administration's co-ordinator for M-UF from 2009 to 2014 and then Director of the Gothenburg Local Interaction Platform (LIP) 2014–2016. From 2018 he is a member of the Gothenburg Consortium Council which is made up of the seven organisations that won the bid for Mistra funding 2010–2019.
During 2019 he is also its chairman. The Council is now in the process of preparing for continued collaboration with eight partners from 2020 to 2024.
As a back-drop, the presentation will describe the role of the County Administration, what trans-disciplinarity means to a multi-sectoral public authority, and what such an agency can contribute. It will also dwell a little on the challenges it faces, trying to promote sustainable development. Some examples are given from this experience. We believe that trans-disciplinarity and close collaboration with other organisations is the only way forward.
Then, it will go on to reflections on what forms of organising and structures that are needed, considering the imperative to understand and address complex sustainability issues. What skills and capacities are needed? How do you influence decisions and processes? And finally, what are the experiences so far of trans-disciplinary work, through the local interaction platform of M-UF

Keynote II: The Time is Now: Are We Ready to Rumble for Societal Transformation?
Dena Fam, Associate Professor
Cynthia Mitchell, Distinguished Professor
Institute for Sustainable Futures, University of Technology Sydney, Australia

We live in a period where human activity has become the dominant influence on our planet. As a result of the Anthropocene, we are facing unprecedented challenges to life on earth. Addressing complex sustainability issues that threaten the existence of humans and other species, such as climate change impacts, biodiversity loss, water and resource scarcity, and global food security, requires rapid, far reaching and unprecedented transformations in all aspects of society.
What ought to be the role of TD professionals (academics and practitioners from industry, government and the community) in effecting this scale and speed of change? What would it take to scale up the impact and reach of our TD efforts? What new forms of dispositions, learnings and leadership might help, personally and institutionally?
In true transdisciplinary fashion, this interactive session is an opportunity to collectively explore our perceptions around the roles, opportunities, and responsibilities we have as TD protagonists for societal transformation. We look forward to rumbling* with you.
* with thanks to Brene Brown

PARALLEL SESSIONS I

CAPTURING AND STRENGTHENING SOCIETAL EFFECTS OF TD-RESEARCH

Wednesday, 11.09.2019, 10h50 – 12h30
[Wallenbergsalen]
Organiser(s): Martina Schäfer[1], Alexandra Lux[2], Sabine Hoffmann[3], Lisa Verwoerd[4], Stephen Williams[5], Jens Newig[6], Brian Belcher[7,8], Christian Eismann[9], Rachel Claus[7], Matthias Bergmann[2]
[1]Center for Technology and Society, TU Berlin; [2]ISOE – Institute for Social-Ecological Research, Frankfurt; [3]Eawag, Swiss Federal Institute for Aquatic Science and Technology, Switzerland; [4]VU Athena Institute; [5]University of British Columbia; 6: Leuphana University, Faculty of Sustainability, Germany; [7]Royal Roads University; [8]Center for International Forestry Research; [9]Intra3
Keywords: effective research, societal efficiency, unintended effects, impact categories, methodological procedures

Session conveners:

Martina Schäfer, Alexandra Lux, Matthias Bergmann

Transdisciplinary research is confronted with increased demands to prove its contribution towards solving complex societal problems. The session aims at discussing whether and how it is possible to capture links between certain methodological procedures and the respective societal effects of transdisciplinary research projects. The contributions in this session will address one or more of these challenges:
One precondition for demonstrating transformations towards problem solving is to describe the effects that transdisciplinary sustainability research unfolds in society. Therefore, categories are needed that capture different types and scalar dimensions of societal effects. It is a challenge to assess to which extent these different types of effects have been achieved during and after transdisciplinary research processes, considering also the risks and unintended effects of TD research.
A further assumption is that the choice of methods and procedures specific for transdisciplinary research (e.g. in joint problem formulation, stakeholder participation, knowledge integration) influences the quality of the results of transdisciplinary research processes and their effects. Currently there is no shared understanding among the TD community, which methodological elements foster the potential for (societal) effects.
Session design:
1st slot of the session: Focus on analyses of intended and unintended (societal) effects, 4 inputs á 12 minutes
Discussion along two blocks:
- How to capture and describe intended and unintended (societal) effects? (25 minutes)
- How to strengthen (societal) effects by choice of methods and procedures? (15 minutes)

2nd slot of the session: Focus on methods, project management and funding conditions to strengthen societal effects; 3 inputs á 12 minutes
- if necessary (different participants): short review of the discussion of the 1st slot (5 minutes);
Discussion:
- New insights how to capture and describe intended and unintended effects? (10 Minutes)
- How to strengthen (societal) effects by choice of methods, project management as well as funding conditions? (20 minutes)
- Overall discussion of contributions of slot 1 and 2 (20 Minutes)

Inputs Slot 1:

1) **Closing the research-to-practice gap: A conceptual model for Transdisciplinary Sustainability Research** (Sabine Hoffmann, Christian Pohl, Julie Thompson Klein)
Current discourses about the research-to-practice gap in td-research have mainly focused on exploring the various conditions that need to be fulfilled to produce 'socially robust' knowledge that then contributes to solving sustainability-related problems. While exploring these conditions, discourses have rarely built on the broader knowledge utilization literature. Hoffmann et al. (subm.) address this gap by bringing valuable insights from this body of literature, which acknowledges the 'fundamental social ways in which knowledge emerges, circulates, and gets

applied in practice' (Greenhalgh and Wieringa, 2011). These insights are helpful in advancing our understanding, why td-research processes, which produce 'socially robust' knowledge, do or do not contribute to sustainability.

2) **Assessing the societal impacts of transdisciplinary research projects using impact narratives: a mixed methods approach** (L. Verwoerd, R. De Wildt-Liesveld, P. Klaassen, B.J. Regeer)

The increased practice of transdisciplinary research (TDR) is accompanied by a need to assess its (un)intended societal impacts and establish the quality of its conduct. Looking beyond TDR's good intentions, how can its societal merit be proven? And, what distinguishes good quality TDR conduct? Using a mixed methods approach, we build on previous findings on the societal impacts of a TDR case study and develop and test several impact stories: narratives on how the diverse types of impact were attained. We test these narratives amongst the diverse actor groups that participated with the TDR project. In the paper, we present preliminary findings on the impact pathways of the project and critically reflect on the value of impact narratives as a method to accurately link TDR outcomes to research conduct.

3) **Sustainability Transition Impacts: Evaluating Transdisciplinary Sustainability Transition Experiments** (Stephen Williams, John Robinson)

Evaluating sustainability transition experiments poses a number of challenges beyond those of traditional evaluation. Transitions are inherently boundary-spanning and affect multiple domains. They occur within complex systems, which implies interdependence between system elements, and emergent phenomena that cannot be predicted a priori, and discontinuous or non-linear effects of systems interventions. Not only is the system constantly changing, which poses challenges of attribution, system transitions tend to take place over long time periods. The integration of these elements leads to the proposed three-part evaluation framework of process, societal effects (short term outputs and medium term outcomes of the process), and sustainability transition impact (longer term impacts that reflect societal transition such as norm and cultural narrative change, social learning, and changes in governance roles and relationships between system actors).

4) **Linking Modes of Research to their Academic and Societal Impact. Evidence from 80 Sustainability-oriented Research Projects** (Jens Newig, Daniel J. Lang, Stephanie Jahn, Judith Kahle, Matthias Bergmann)

The contribution reports results from quantitative (80 projects) and qualitative analyses (6 In-depth analyses) on societal and academic impact of td-research. The results imply that contributions from practitioners in research projects positively influence societal outcomes. Analyses also indicate that the inclusion of non-academic actors as equal partners in research projects is negatively associated with academic outputs and citations. However, the analyses show that projects, which apply methods of knowledge integration are more likely to be successful in both the academic and the societal sphere. Finally, we find that funding criteria are of enormous importance for both the design of the research mode and the outcomes of sustainability-oriented research.

Inputs Slot 2:

5) **Societal effects of transdisciplinary sustainability research – How can they be strengthened during the research process?** (Alexandra Lux, Martina Schäfer, Matthias Bergmann, Thomas Jahn, Oskar Marg, Emilia Nagy, Anna-Christin Ransiek, Lena Theiler)

This talk will give insights into an empirical study that aimed at identifying major challenges to enhance societal effects of transdisciplinary research. The study revealed that those effects cannot be facilitated entirely intentional, but potentials for societal effectiveness can be generated – they evolve between the framework conditions of a project and a reflexive approach in transdisciplinary processes. Effects emerge in the reciprocal interaction of successful research processes and the products that are created in them.

6) **Assessing transdisciplinary research design and implementation for outcomes: Lessons from 9 projects** (Brian Belcher, Rachel Claus, Rachel Davel, Luisa Ramirez, Stephanie Jones)

The contribution refers to evaluative methods and the results of their application to a set of nine completed research projects (5 international research-for-development projects and 4 applied graduate student research projects). The analyses assess the degree and character of transdisciplinarity applied in each case using a Transdisciplinary Research Quality Assessment Framework and empirically assess the societal impacts of each project using a participatory theory-based outcome evaluation. The presentation will provide a brief overview of the range of cases, the analytical methods employed, and present the key findings and lessons learned to date pertaining to impact pathways, types of project contributions, research user perceptions, and critical aspects of researcher competency and project management for success.

7) **Innovation management for sustainability projects. Becoming effective with limited resources** (Christian Eismann, Susanne Schön)
The authors outline their approach of the „Solution Readiness Levels" (SRL) to measure and manage complex sustainable sociotechnical/ socioecological innovation processes. The approach links a figurational sociology-inspired view on transdisciplinary research projects with criteria to measure the progress of sustainability projects. Among other things, this progress is defined by specific effects and impacts taking place in the close environment of ongoing transdisciplinary research projects regarding individual, institutional, and spatial facets. Theses effects are closely connected to the solution's degree of maturity (readiness level). Used as a project management tool, the SRL can help to identify relevant effects as well as strengthen impact-oriented aspects of research processes.

DYNAMICS OF INTER- AND TRANS-DISCIPLINARITY WITHIN INSTITUTIONS: CULTURES AND COMMUNITIES, SPACES AND TIMEFRAMES

Wednesday, 11.09.2019, 10h50 – 12h30
[Europa]

Organiser(s): Bianca Vienni Baptista[1], Julie Thompson Klein[2]
[1]TdLab, ETH Zürich, Switzerland; [2]Wayne State University, United States and TdLab, ETH Zürich, Switzerland
Keywords: interdisciplinary, transdisciplinarity, institutions, cultures, timeframes, comparative perspective

Abstract
This panel will deepen understanding of the roles context and change play in shaping inter- and trans-disciplinarity. In doing so it will examine transformations of academic institutional spaces and timeframes. Panellists will describe how history and geography have shaped theory and practice in their particular countries, related challenges, and opportunities.

Contents of the activity
Interdisciplinarity (ID) and transdisciplinarity (TD) posit new landscapes and timescales for knowledge production that foster interaction of different perspectives from more pluralistic and collaborative practices. To understand challenges posed by the relationship of universities, knowledge production, and society, this panel seeks to co-construct a more refined framework for analyzing challenges of related research and education. It will focus on processes of institutionalization, cultural transformations, and characteristics of communities that emerge.

The panel builds on discussions that began at a Double Session during the International Transdisciplinary Conference 2017, held at Leuphana University of Lüneburg (Germany) and involving representatives of universities in Brazil, Australia, Germany, and the United Kingdom.

In this session, representatives from new examples of projects and programs in Europe, Latin and North America and Africa, will bring comparative perspectives to both theory and practice, in the process describing strategies and models of change as well as patterns of success and failure.

Vienni will set up the session based on current research and literature. Klein will follow with a handout digesting relevant insights from a study of conditions for changing campus cultures.   It will serve as an opening framework, open for revision as presentations and subsequent discussion warrant.

Participants will address the following questions in the course of their presentations:

- What potentials and advantages do ID and TD research present in your country, including contributions to solving complex multidimensional problems?
- How have historical and geographical contexts conditions shaped institutional possibilities and limits?
- How are ID and TD research organized in time and space, including any special initiatives to accomplish national and local goals?
- Are concepts and practices of ID and TD challenged and even being supplanted by alternative discourses such as "problem solving," "relevance," "accountability," "impact," "collaboration," "globalization," and other localized priorities?

Panelists' presentations: 10 minutes presentation.

- Dena Fam, Associate Professor, Research Director, Institute for Sustainable Futures, University of Technology, Sydney.
- Beatrice Akua-Sakyiwah, Coordinator and Lecturer, Gender Development and Resource Centre GIMPA, School of Public Services and Governance, Ghana.
- Danilo R. Streck, Professor at the Graduate School of Education, Unisinos University, Brazil.

Discussant. Catherine Lyall, Professor of Science and Public Policy Science, Technology & Innovation Studies, School of Social and Political Science, University of Edinburgh, United Kingdom.

Discussion. Upon completion of presentations and topics raised by Lyall, Vienni and Klein will invite the audience to reflect on the panelists' presentations and consider edits to the opening handout. Panelists will also join in considering the relationship of "interdisciplinarity," "transdisciplinarity" and "culturality" as well as the possibility of "interculturality" across commonalities and countries.

Stream

This session addresses multiple points of interest in all three streams of the call for submissions though framed by Stream "Societal transformation" and "Methodological innovation":

Societal transformation

- What forms of organizing are needed for our institutions, agencies, companies and universities to handle the necessary transformations, with particular reference to collaboration between different types of stakeholders?

Methodological innovation

- What does individual and organisational learning in change processes – working on, challenging and transgressing borders – look like?
- How can universities promote collaborative learning?

MORE THAN TEACHING – TRANSDISCIPLINARY CAPACITY BUILDING I
(COMPOSED SESSION)
Wednesday, 11.09.2019, 10h50 – 12h30
[Antarktis]

I. Presentation:
Key competences of master's students to design and lead transdisciplinary research in intercultural settings in the Global South
<u>Danny Nef</u>**, Pius Krütli, Michael Stauffacher**
ETH Zurich
Keywords: Key competences, students, intercultural settings

The TdLab at ETH Zurich offers for its MSc students a problem-oriented and research based teaching course: the transdisciplinary case study (tdCS) in the Seychelles. During the course, students learn what is needed to ensure responsible North-South cooperation by working closely with stakeholders from the public and private sector as well as the civil society. The tdCS distinguishes between two phases: semester phase and field phase. The main objective of the course is to provide students with a framework in which they can acquire and enhance various methodological, social, and communicative competences and, furthermore, develop directly applicable results for practice. This framework is structured in five main learning goals, each with a specific set of competencies.

The acquisition of a wide range of characteristic competence is of vital importance because responsible intercultural collaboration and common knowledge production does require them and because they are necessary in order to produce socially relevant knowledge. In order to account for this, we evaluated the tdCS 2018 over the whole duration, i.e. spring semester and a succeeding three weeks fieldwork activity in the Seychelles. Mainly, we wanted to get a more profound understanding of how students cope in an intercultural setup with a given set of competences and to what extent this setup offers an added value for the overall learning process. In particular, we wanted to understand to what extent the predefined key competences are considered important for a successful completion of the study from the perspective of the students and the involved stakeholders and to what extent different phases of the tdCS have offered situations that are suitable to stimulate the development of key

competencies. We collected the data in a longitudinal and cross-sectional study using structured and semi structured questionnaires, semi structured interviews, and participatory observations.

In our presentation, we would like to present and critically reflect the results of the evaluation. In essence, they show that students and stakeholders value a preponderant majority of the course competencies as either essential or important for a successful completion of the tdCS. The evaluation has also shown that the course structure with two phases, one semester and one field phase, leads to an optimal learning success by exposing students to situations that are suitable to stimulate the development of targeted competencies. Whereas, from a students' perspective, these situations emerged mainly during the field phase, we believe that the fundament for being able to use these situations as competence-building learning opportunities is laid in the preceding semester phase. In this phase, not only the necessary methods are taught, but also the context-specific understanding is worked out, which is what makes a successful research in the field possible in the first place. Foremost, this enables a successful engagement with stakeholders, arguably the most important ingredient for an auspicious and meaningful research and useful project delivery. The two reports prepared by the students in both tdCS also show that this goal has been achieved. Both reports were and are used by key stakeholders as an important basis for decision-making.

The two reports can be found under the following links:

Report tdCS16:

Solid Waste Management in the Seychelles

www.ethz.ch/content/dam/ethz/special-interest/usys/tdlab/docs/csproducts/cs_2016_report.pdf

Report tdCS18:

Waste Management in the Seychelles – Pathways for Systemic Change

www.ethz.ch/content/dam/ethz/special-interest/usys/tdlab/docs/csproducts/cs18-report.pdf

II. Presentation (short):

Intercultural learning for transdisciplinary research collaboration

Dorji Thinley[1], Sonam Wangmo[2], Ugyen Lhendup[3], Isabel Sebastian[4], Katie Ross[4]

[1]Royal University of Bhutan, Paro College of Education; [2]Royal University of Bhutan, Institute for Gross National Happiness Studies; [3]Royal University of Bhutan, Gedu College of Business Studies; [4]University of Technology Sydney, Institute for Sustainable Futures

Keywords: intercultural, learning, collaboration

Globally, interest in transdisciplinary research is growing. Yet, different cultures have their own unique context, history, and thus their own unique paradigmatic and methodological approaches to transdisciplinarity. Intercultural learning creates the opportunity to share insights, practices and theories behind different types of transdisciplinary approaches. These types of learning exchanges also highlight assumption, and trigger reflection, growth, and integration in the different types of transdisciplinary practice.

From February 2018 to May 2018, the Royal University of Bhutan and the University of Technology Sydney undertook such a learning exchange. For two weeks, delegates from the Royal University of Bhutan visited Sydney. During their time in Australia, the Institute for Sustainable Futures (ISF) ran training sessions on the types of skills and tools the Institute has found helpful in their 20 years of practicing transdisciplinary research. Concurrently, the Royal University of Bhutan members had the opportunity to develop research inquiries with ISF, centred on issues relevant to their context, through applying the transdisciplinary methodologies.

In May 2018, the Royal University of Bhutan reciprocated the exchange. In this second half of the learning collaboration, members of the Royal University of Bhutan delivered sessions on the frameworks and contexts relevant to practicing transdisciplinary research in Bhutan, such as the Gross National Happiness guidelines and Bhutanese historical contexts. The two universities engaged in in-depth conversations about the different worldviews and paradigms that sit within each culture, and the implication this might have for the types of transdisciplinary research that is practiced in Bhutan. The partnership continues in terms of seeking joint transdisciplinary research, for example in the areas of climate change, achieving Gross National Happiness goals, and development of institutional support for transdisciplinary research.

This case study of intercultural learning represents a commitment to improving and strengthening practice, in a collaborative way. The experience triggered many questions of what transdisciplinarity would be within the context of Buddhist heritage, and what methods might exist that are already, inherently transdisciplinary, such as traditional storytelling. Sharing the reflections and lessons of this case study have implications for how others might undertake

similar, meaningful intercultural learning experiences. Importantly, this is a chance to share methodological and theoretical questions arising from a Bhutanese transdisciplinarity.

III. Presentation (short):
Collaborating with Civic Society Actors in Higher Education Teaching – Shaping the Moments of Interaction
Annaliesa Hilger
University of Wuppertal
Keywords: higher education, civic actors, transdisciplinary processes, local level, seminar settings

Formats such as Service Learning aim to educate students for sustainable development and at the same time contributes to societal transformation. Working with real-world problems enables the students to learn how to deal with complex (sustainability) problems and to acquire social and democratic competencies. Ideally, these formats have – due to the production of socially-robust knowledge or the development (and sometimes implementation) of a project – a stimulating effect on transformation. However, there are some challenges as well. One of the most critical moments is, for example, the start of the collaboration, as it is quite often characterised by uncertainties and diverging expectations on all sides.

Thus, the contribution outlined is focused on the question, what seminar settings are needed for a fruitful collaboration which will effectively contribute to societal change and still leave a scope for the students to try out themselves. The presentation thereby addresses the conference's methodological innovation stream, approaching the questions of how universities can promote collaborative learning, as well as, the question of how different types of transdisciplinary pedagogies, research methods and processes of co-production can be developed to more effectively contribute to societal transformations.

The study is based on more than ten small transdisciplinary research processes from two seminars with about 20-25 students each. The students collaborated with actors of urban gardens, focusing on the production of socially-robust knowledge for the further work of these gardens. Interestingly, these non-scientific actors are mainly voluntarily working, and almost all of the students are future teachers; both unfolding profound effects on the conditions of the transdisciplinary processes. Within the collaboration, the non-scientific actors and the students identified together a socially relevant problem. The students then transferred the identified problem into a workable research question and decided on a suitable method. At the end of the seminar, the students research results were discussed and reflected with the non-scientific actors. The outlined contribution is based on a qualitative content analysis of guided interviews with the collaborating actors, enriched by the student's experiences (field reports, seminar evaluations, structured group reflection).

Interestingly, first findings indicate that the student's research results from areas in which the non-scientific actors were not experts had the most supportive effect (e. g. surveys with residents vs. irrigation system development). In addition, the professionally perceived activities from the students at the beginning raised expectations among the non-academic actors of equally professional results. Also, some non-scientific actors expected – despite partly high age differences – that the students might came up with a strategy for the gardens and suggestions for its step-by-step implementation. On the basis of these and other results, the contribution presents and discusses consequences for the planning and accompanying of collaborating with civic society actors in higher education seminars.

IV. Presentation (short):
Transformative Innovation Labs – the real-world lab approach in the context of graduate education for sustainability
Philip Bernert[1], Nele Fischer[2], Annika Lomberg[3], Martina Schmitt[3], Matthias Wanner[3]
[1]Leuphana University of Lueneburg; [2]Freie Universität Berlin; [3]Wuppertal Institute
Keywords: Real-world laboratory, Education for sustainability, Change Agent, transformative learning

IIn the year 2015, two crucial stepping stones towards a global sustainability transformation have been brought forward by the United Nations: The Paris Climate Agreement and the Sustainable Development Goals, the renewed global sustainability agenda. Especially the SDGs emphasize the need for new partnerships between societal actors, bridging discipli-nary, sectoral, and institutional barriers through innovative approaches when tackling sus-tainability challenges.

In order to deliver more significant societal impacts, real-world laboratories and real-world experiments as a transdisciplinary and action-oriented endeavour are increasingly discussed in sustainability research. These

laboratories provide research spaces that allow for the col-laboration between societal and scientific actors and aim to generate both societal impact and scientific insights about sustainability transformations.

Due to the real-world laboratory approach being fairly new, there are only few examples of how to integrate real-world laboratory approaches into higher education.

In our presentation, we share insights from our Transformative Innovation Labs, that bring the lab approach to higher education for sustainability at two German universities.

The Transformative Innovation Labs engage at the interface of transformative-experimental-transdisciplinary innovation mode and education for strong sustainability. Their aim is to create real-world learning environments, that allow students to develop key competencies for sustainability transitions: Systems thinking competence, anticipatory competence, normative competence, strategic competence and interpersonal competence (Wiek, Withycombe & Redman, 2011). Those competences are fostered with specific mod-ules inlcuding a social simulation (serious game) on the world's future, methodical inputs, peer-learning formats and on-site workshops.

The Transformative Innovation Labs have been integrated into two different well-established graduate programs at two German universities in order to leverage the innova-tive qualities of real-world labs not only in research, but also in education.

By preparing and enabling students to conduct experimental transformative and transdisci-plinary sustainability research in the context of their master theses, the projects directly contribute to the initiation of societal transformation processes.

In our talk, we present a specified curriculum that empowers students to become Change Agents for sustainability transformations when conducting their research as part of their master theses. This curriculum builds on a series of conceptual and methodological inputs that provide the basis for the students' research. Moreover, it fosters the students' interdis-ciplinary capacity building by arranging shared teaching events bringing together students from two different universities, Freie Universität Berlin and Leuphana University of Lüne-burg. After the introductory part, the students choose their own, sustainability-related field of research, find appropriate practice partners within and co-design and execute a joint re-search and intervention process. Their projects close with either a seminal report or a de-rived master thesis.

As an innovative approach for the skill and competency development at the science-society interface, our approach is a valuable contribution to the conference stream "societal trans-formation".

Key readings

Schneidewind, U., Singer-Brodowski, M., Augenstein, K., & Stelzer, F. (2016). Pledge for a transformative science. A conceptual framework (Nr. 191). Wuppertal: Wup-pertal Institute for Climate, Environment and Energy.

Wanner, M., Hilger, A., Westerkowski, J., Rose, M., Stelzer, F., & Schäpke, N. (2018). Towards a Cyclical Concept of Real-World Laboratories: A Transdisciplinary Research Practice for Sustainability Transitions. DisP - The Planning Review, 54(2), 94–114. https://doi.org/10.1080/02513625.2018.1487651

Wiek, A., Withycombe, L., & Redman, C. L. (2011). Key competencies in sustainabil-ity: a reference framework for academic program development. Sustainability Sci-ence, 6(2), 203–218. https://doi.org/10.1007/s11625-011-0132-6

POWER DYNAMICS IN TRANSDISCIPLINARY RESEARCH: FROM POWER OVER TO POWER WITH?

Wednesday, 11.09.2019, 10h50 – 12h30

[Sydamerika]

Organiser(s): Livia Fritz[1], Claudia Binder[1], Tobias Buser[2,4], Olivier Ejderyan[3], Christian Pohl[3], Isabelle Providoli[2], Flurina Schneider[2], Theresa Tribaldos[2]

[1]EPFL; [2]Centre for Development and Environment CDE, University of Bern, Switzerland; [3]TD-Lab, ETHZ; [4]Td-net

Transdisciplinary approaches have been developed with the expectation that the inclusion of practitioners and their expertise in research processes allows to co-produce societally relevant knowledge and leverage the transformative power of research. While some of the transformational goals associated with transdisciplinary research relate to developing 'power to' (e.g., empowerment of certain ideas or actors) or 'power with" (e.g., societal learning), the inclusion of diverse actors and knowledges does not necessarily lead to these desired outcomes. The design of the process and the context in which it is embedded affect how participants relate to it and how their values and

expertise are reflected in it. Regarding process design, principles of transdisciplinary research stress the need for shared control of knowledge production and allude to the ideal of interactions on "equal footing", hence implicitly to balanced power relations.

Yet, the role of power dynamics and imbalances in transdisciplinary practices has increasingly been acknowledged and the need for unfolding the entanglements of power and politics throughout such research processes has been recognised (Bréthaut et al., 2019; Marshall et al., 2018; Schmidt and Neuburger, 2017, Bieluch et al., 2016; Fazey et al., 2013). An increasing number of scholars find that power relations among researchers (MacMynowski, 2007), between researchers and practitioners, and among practitioners shape participation processes in research (Marshall et al., 2018; Pohl et al., 2010). The integration of diverse knowledges has moreover called attention to the epistemologies of different knowledge systems and to varying degrees of trustworthiness, and authority ascribed to them in knowledge co-production processes (McKee et al., 2015; Schmidt and Neuburger, 2017).

Despite this wide acknowledgement that power dynamics pervade transdisciplinary processes, their role is hardly explored in greater detail. This session, thus, wants to contribute to shedding light on this lacuna by jointly reflecting on the diverse ways in which power can shape transdisciplinary processes, including potentially desired forms such as empowerment ('power to') or collective learning ('power with') as well as potentially undesired ones such as domination and control ('power over').

The aim of this session is to share experiences with both desired and undesired forms of power within transdisciplinary knowledge production processes as well as with useful methods for tackling them, thus building a practice-related knowledge base on the workings of power in transdisciplinary research. We invite both researchers and practitioners involved in transdisciplinary research to contribute their reflections on experiences with power dynamics in transdisciplinary research projects.

Format:

(i) The session starts with short impulse talks in which presenters share their experiences with (tackling) situations of power in transdisciplinary processes (4-5 talks, 30 mins. in total), using a Pecha Kucha (format where the presenter shows 20 images/slides, each for 20 seconds; images advance automatically and the presenter talks along to the images);

(ii) The talks are followed by a structured discussion (see guiding questions below) among all session participants, using a world café format or similar (60 mins. In total).

Impulse talks:

Claudia, Binder: The input talk will highlight experiences with respect to power dimensions in different contexts in the developing and industrialized world based on her more than 15 years of experience in inter-and transdisciplinary research. It will address the following question: (i) what are unspoken power-relations and expectations in a developing country, industrialized country and industry context?

Olivier, Ejderyan: The micropolitics of power in TD research. This input talk will focus the micropolitics of power within TD processes. Micropolitics relate to the affects generated by the relationships between participants engaged in a TD process, for example: feeling committed to the objective of the TD process, being upset because one's option has been rejected by the group, being sympathetic to the perspective of a specific participant etc. By reflecting on TD projects in river management and energy infrastructure provision in Switzerland, I discuss how these micropolitics might influence how TD researchers deal with more obvious power relationships within TD processes (such as difference of interests, gender, or the socio-economic situation of participants).

Livia, Fritz: Tracing power relations in five sustainability research projects. This input talk will rely on a meta-analysis of five TD projects in the field of sustainability research. It will explore the sources and mechanisms of power in different phases of TD process and ask how power relations shaped the interactions of researcher and practitioners.

Flurina, Schneider and Isabelle Providoli: Power dynamics in different socio-political settings. This input talk with focus on experiences with power dynamics involved in doing transdisciplinary research in different socio-political settings: examples come from communist Lao with its one party system, (post-)conflict Myanmar in transition from authoritarian to democratic government, politically instable Madagascar with often absent government on the ground, and the politically stable Switzerland with its long tradition in direct democracy.

Theresa Tribaldos and Flurina Schneider: Emotions in group dynamics on equal footing.

In our research project "Enhancing transformative research for sustainable development: mutual learning within research networks" we have a regular focus group for exchanging experiences and jointly reflecting on novel ideas for theories of change. Emotions in this group have a considerable impact on group dynamics and determine to a large degree if the outcome of the sessions are productive and fruitful. We would like to share some insights from this process and point out some ideas how to deal with such dynamics.

Guiding questions for the discussion:

- Recognising power: How and in which situations does power manifest in transdisciplinary research? Who exercises it?
- Understanding power: How to operationalise theories of power for the context of TD sustainability research?
- Tackling power: Which methods and tools allow for minimising undesired and maximising desired forms of power in transdisciplinary research?

CAN WE CO-TRANSFER URBAN TRANSFORMATION KNOWLEDGE?

Wednesday, 11.09.2019, 10h50 – 12h30

[Nordamerika]

Organiser(s): Diego Sepulveda-Carmona[1], Lisa Diedrich[2], Flavio Janches[3]

[1]TU Delft, The Netherlands; [2]University of Buenos Aires, Argentina; [3]Swedish University of Agricultural Sciences, Sweden

Keywords: Knowledge co-transfer, transdisciplinary processes, climate change adaptation

The current level of complexity that determines urban development has increased due to the new challenges we are imposed to face, such as the multiple effects of climate change. At the same time, the asymmetries of knowledge development on climate change effects and its challenges, given its inherent local and sensitive conditions, determine the need for knowledge transfer worldwide. But the complexity of the problems and the variety of actors involved is demanding ever more tailor-made strategies – this prompts the quest for new knowledge *transfer* methodologies, responsive to both sites/ site actors and institutional research/ researchers.

The question is then if sustainable socio-territorial transformation can be supported by a *co-transfer* of knowledge, catering to the different demands? Such a transfer concept relies on the co-creation of urban transformation knowledge while also involving the co-creators in the act of continuously translating their knowledge to each other and to different socio-political contexts and geographical locations. The exploration of co-transfer methodologies can be conducted from the ground up, in focalising on select examples. In this case the *Emscher regeneration* in the Western German Ruhr region has been used as a reference case to co-transfer knowledge to the *Reconquista river sanitation plan* in greater Buenos Aires, Argentina. Both transformation areas are currently organised as "urban living lab platforms" in practice.

The session will present the ongoing project, arranged as an integrated teaching-research experience carried out across three universities and three disciplines, namely the University of Buenos Aires (urban design), the Technical University of Delft (regional planning), and the Swedish University of Agricultural Sciences (landscape architecture). Over the past years teachers and students have formed inter-disciplinary research teams and experimented with co-defined evaluations, possible agreements between different sectorial agendas, and the resulting lessons learnt. Knowledge transfer methodologies have been tested as agents to reveal new opportunities and support for integral urban development programs. Spatial mapping has served to identify and share the critical transformation parameters and ways of working.

Session design

The first half of the session (45 min) will be used to introduce the case study, the co-transfer of urban transformation knowledge from *Emscher Regeneration* to *Reconquista River Sanitation*. To frame the transdisciplinary foundation and the pluralistic actor constellation of the project, the authors use BEYOND BEST PRACTICE, a method derived from design thinking (cf. Diedrich & Kahn & Lindholm 2015), which is stringent enough to capture the complex project set-up academically and flexible enough to allow for ongoing adaptation practically (of theoretical fundaments, methodological refinement, and change in actors): They start from outlining their MOTIVATIONS for the project, then describe the transdisciplinary COLLABORATIONS among actors, which constitute the basis for specifying

the knowledges each one contributes to CONVERSATIONS within project. These allow to take action through SPECULATIONS (research by design, action research) and eventually lead to raising co-created knowledge which corresponds to a RE-EVALUATION of the urban transformation process.

In the second half of the session (45 min), the authors aim to involve the audience to invite the audience to sit around tables in smaller groups and

- comment upon the BEYOND BEST PRACTICE method from their points of view, related to their different backgrounds (academic disciplines, professions, NGOs, citizens, companies, etc), in order to retrieve recommendations for improving the method in parallel to the ongoing co-transfer process of the Emscher-Reconquista project. This yields results for the academic set-up (suggestions for further theoretical foundations, for refined methodologies, for pedagogical involvement) and for practical aspects (further actors to invite, process ideas for transfer operations, communication frameworks, etc).
- quote related projects with similar intent, constellations, knowledge gaps, or reference projects with inspirational value
- help the authors find ways for how to expand their current actor constellation (mainly consisting of authorities, agencies, and universities) by citizens and their organizational forms, in view of enhancing local empowerment
- speculate themselves and test-apply the method onto projects they might want to bring in.

After 20 minutes the group work is concluded and the teams are invited to gather in a plenary setting to share the main outcomes of the group discussions as SPECULATIONS and RE-EVALUATIONS.

URBAN CHALLENGES AND TRANSFORMATIONS I (COMPOSED SESSION)

Wednesday, 11.09.2019, 10h50 – 12h30
[Asien]

I. Presentation:
Unbundling the challenges and pathways of transforming African cities through research collaboration in diversity (TACToRCD)

Peter Elias[1], Adelina Mensah[2], Iniobong John[3], Ademola Omojola[1], Bunmi Alugbin[1]
[1]Lagos Urban Studies Group (LUSG), Department of Geography, University of Lagos, Nigeria; [2]Institute for Environmental and Sanitation (IESS), University of Ghana, Legon, Ghana; [3]Department of Building, University of Lagos, Nigeria

Keywords: informal urbanization, service delivery, trans-disciplinary research; data-driven solutions

Evidence-based decision-making for transforming cities is no longer new as several governments are beginning to rely on it to deliver interventions. There is increasing shift from isolated or single discipline to transdisciplinary (TD) knowledge solutions in an effort to adequately understand and tackle the complex problems of urban governance. Transforming African cities and communities especially slums which are confronted with huge deficits in urban basic services and infrastructure including housing, transportation, sanitation, water, disaster management and participatory planning requires open and transparent process of knowledge solutions. Transdisciplinary research which is collaborative possesses the elements and requirements for making African cities safe, inclusive, resilient and sustainable in line with the Sustainable Development Goal 11. It emphasizes and prescribes the pathways to co-design, co-create and co-produce knowledge solutions by the coming together of diverse stakeholders in the urban space. This paper stems from a theory of change that the coming together of scientific and non-scientific actors in TD research could disrupt exclusion and marginalization prevalent in African cities and communities thus making them safe, inclusive, resilient and sustainable. However, transforming African cities through research collaboration in diversity (TACToRCD) presents unique challenges and pathways. The paper therefore captures lessons learnt from the nature and process of transforming African cities through research collaboration in diversity using Lagos, Nigeria and Accra, Ghana as case studies. It reflects on the impacts and challenges of coming together of diverse disciplines, stakeholders and organizations to address multifaceted urban problems; examines the factors accounting for the different perspectives and priorities on urban issues; and the pathways for integrating and implementing evidenced-based solutions. Candidate slum communities were purposively selected in the two African cities based on their homogenous social and cultural characteristics and urban challenges for in-depth study. The data collection involves the triangulated methods of household survey, focused group discussion and key informant interviews in the

selected slum communities as well as engagements with relevant organizations and experts as critical stakeholders. The localization of SDG 11 in Lagos and Accra, identification and mapping of local actors, and the various strategies of stakeholder engagements provided integrated pathways and solutions for the generation and use of knowledge in transforming African cities. Unbundling the challenges and pathways of transforming African cities through research collaboration in diversity will strengthen and legitimize the process and outcomes of knowledge solutions which will enhance a sense of inclusion and empowerment for decision-making.

II. Presentation:
Insights from the AIR Network: A transdisciplinary approach to addressing air pollution in informal settlements
Fiona Lambe[1,2], William Apondo[2], Cressida Bowyer[2], Patrick Büker[2], Cindy Gray[2], Matthew Hahn[2], Miranda Loh[2], Medcalf Alexander[2], Cassilde Muhoza[2], Kanyiva Muindi[2], Timothy Njoora[2], Heather Price[2], Charlotte Waelde[2], Megan Wainwright[2], Anna Walnycki[2], Jana Wendler[2], Sarah West[2], Mike Wilson[2], Residents Mukuru Informal Settlement[2]
[1]Stockholm Environment Institute; [2]Air Network
Keywords: Air pollution, creative methodologies, co-production, informal settlement, Kenya

Air pollution remains a major environmental, health, and policy challenge in both developed and developing countries, particularly those that are rapidly urbanizing. Despite considerable research into the effects of air pollution on human health and well-being, and the implementation of mitigation measures, awareness raising and exposure reduction campaigns in Sub Saharan African cities including Nairobi, neither a reduction in particulate emissions nor significant positive effects on the health of informal settlement dwellers have been observed. Interventions surrounding cookstove use, for example, have not been successful in terms of health outcomes. There are various, multifaceted reasons for the lack of positive health effects, including that air pollution is often not visible and that non-communicable diseases linked to air pollution are not as high on people's 'concern agenda' as challenges linked to income and livelihoods. The Air Network brought together a multidisciplinary research team from Kenya and the EU, and residents in Mukuru, an informal settlement in Nairobi, to explore these reasons and allow us, in future projects, to co-create innovative, robust and effective interventions to reduce air pollution and people's exposure to it in informal settlements in Sub Saharan Africa. We applied creative and qualitative mixed methodologies including theatre, medical anthropology, participatory mapping, music, and storytelling to explore with community members their personal experiences of air pollution in Mukuru. The approach revealed differing definitions of air pollution amongst residents, depending on individual belief and personal experience. From here, several unexpected entry points for possible solutions to local air pollution were identified. For example, when discussing air pollution with residents, discussions often were not specifically about air pollution, but instead about job creation, urban design and smells. Inadequate waste management emerged as a as a key source of local air pollution, and an area where well designed interventions could have an impact. Furthermore, we found that using theatre and storytelling created an opportunity to shift power dynamics between residents and policy makers and provided new channels for constructive dialogue on upgrading key services in Mukuru.

III. Presentation (short):
Urban transformation and the relevance of critical infrastructure – a systemic and participatory approach
Markus Groth, Steffen Bender, Elisabeth Viktor
Climate Service Center Germany (GERICS)
Keywords: Adaptation, cascading effects, climate change, stakeholder participation, societal transformation

The IPCC special report "Global Warming of 1.5°C" has shown that a warming of 1.5°C compared to pre-industrial levels will lead to strong impacts of climate change. The overall economic damage up to 2100 can be regionally higher if global warming does not reach 1.5ºC but 2ºC. In turn, all emission paths for the target of 1.5°C require rapid and far-reaching emission reductions as well as system transitions in many socially and economically significant areas.

Cities and urban areas are one of the critical global systems that can accelerate and upscale climate action. This requires fundamental transformations of central supply infrastructures in urban areas as well as an improved understanding and comprehensive consideration of the interactions of these critical infrastructures under changing climatic conditions as well as the interaction of cities and their surroundings.

Practical experiences show, that in general there is an awareness of these interconnections, but emergency plans often fall short regarding the growing indirect influences of climate change on infrastructural failures expected in the future. Interactions and interdependencies between critical infrastructures in different sectors have become a

growing phenomenon as they are not only a point of potential vulnerability but may also compound existing vulnerabilities and carry them across multiple infrastructure sectors and elements ("dominio- / cascading effects"). In addition, critical infrastructures include fewer and fewer redundancies and rely more and more on smart networks and digital information exchange, creating an accumulation of risk and a weak link exposing the system to a number of threats. Therefore, there is a growing need for research to overcome the still dominating isolated view of the influence of climate change on critical infrastructures.

To systematically capture the interlinkages in future climatic conditions and to account for potential domino or cascading effects, a systems dynamics approach will be applied. This offers the possibility to represent the various links across relevant sectors and subsectors, and can illustrate the behaviour of the system including its reinforcing and regulative feedback loops and time lags on a quantitative basis. At the centre of the system – and at the same time defining the boundaries of the system under investigation – will be the infrastructural elements of the energy, water and transport sectors.

Transdisciplinary research, stretching from scientific knowledge about regional climate change to real-world experiences in the energy, water and transport sectors, will be the foundation for the systems model. A participatory approach will be applied to identify climate-related drivers causing the most severe failures and losses in the system – either directly in a specific sector, or indirectly affecting a sector due to breakdowns in other areas. Starting with identifying key players along the various value chains and identifying the affected and affecting parties, a stakeholder mapping process will be carried out. Based on this, representatives and experts of the most relevant groups will be interviewed on their expertise and perception about climate related risks, the most vulnerable elements and their dependence on non-climatic influences, their level of preparedness and their adaptive capacity. In a co-design process, individual system models will be built from the perspective of the interviewees, and subsequently joined to one comprehensive group system model.

Within the presentation, the current need for specific transdisciplinary research, the methodological approach as well as first results will be presented.

IV. Presentation (short):
Experimental Governance Practices: Emergence and effects of central approaches in neighbourhood development – experiences from Malmö

Nina Vogel[1], Joakim Nordqvist[2], Jamil Khan[3], Roger Hildingsson[3]
[1]Swedish University of Agricultural Sciences; [2]Malmö University and City of Malmö; [3]Lund University
Keywords: Experimental governance, Neighbourhood development, Learning, Transdisciplinary capacities

Neighbourhoods are literally key sites of change when addressing urban sustainability. Faced with wicked problems, organisational structures of societal actors (such as the public sector and academy) tend not to be designed or adapted to cope with the need for transdisciplinarity in thought, nor in modes of application. This impacts the scope for governance arrangements in neighbourhood development, novel expressions of which are manifold. Such arrangements (sometimes packaged or narrated as 'approaches') can strongly impact production and organising of space through inclusion of unconventional temporalities as well as of actor constellations that assume new roles and capacities, leading to the redistribution of power and legitimacy relations.

Structured compilations and sharing of experiences are essential to critically assess the outcome and value of governance arrangements, and their tentative long-term impact. Additionally, however, built-in feedback structures are needed for these experiences to contribute also to systemic and organisational learning – without which the receptiveness of involved societal actors' organisational structures to transdisciplinary modes of iterative adaptation probably remains dormant or constrained. The goal of the endeavours presented here is to increase the understanding of the nature of such constraints by reporting from qualitative investigations of the existence of and the demand as well as the potential for such learning processes.

The Panel for Sustainable Neighbourhood Development (under the Skåne Local Implementation Platform of Mistra Urban Futures) has studied contemporary understanding and experiences of alternative governance arrangements emerging from the need to deal with wicked problems on the neighbourhood scale. Our study draws from workshops, interviews and field work in 2019 involving practitioners who represent various neighbourhood development processes in Malmö (Sweden).

We found an array of practices that initiate, propel and manage urban development processes. Typically, these practices provide individuals with implicit licence, but not necessarily with formal mandate, to embrace uncertainty and to break with a planning tradition of predefining 'end goals' (cf. master planning). We studied the variability of

the extent to which co-creation and co-/self-governance ensue. When practices take unconventional forms, e.g. in methodically accomplishing deliberation and in facilitating or implementing change, we note how they also challenge conventional roles and may create insecurity – and possibly opposition – among established professional stakeholders. Informants report that lack of mandate regarding the introduction of new practices can impact the long-term safeguarding and legitimising processes of novel governance arrangements in quite different ways: On the one hand, greater licence and the absence of templates allow for the unforeseen, thereby encouraging site-specific unfolding and adaptations of novel governance arrangements. On the other hand, vulnerability arises e.g. due to unstable funding arrangements and because of lack of support or trust from the institutional environment. Alternative approaches to neighbourhood development necessarily vary in form and content. To address their ability to propagate beyond isolated experimental efforts, however, we point to the importance of deliberately working on their relation to the institutional environment in which they arise and are lodged. Our sample from Malmö, where a sequence of unconventional licence-giving in neighbourhood development can be studied, can give pertinent clues or insights about such mechanisms.

This presentation responds and contributes to the discourse concerning alternative neighbourhood development practices and their long-term consequences, and it stresses the importance of strengthened reciprocation with systemic structures to accomplish organisational learning.

V. Presentation (short):
Design-driven co-creation in living environments: Shared interorganizational meanings?

Christina Vildinge[1], Elena Raviola[2]
[1]University of Gothenburg; [2]University of Gothenburg

Keywords: Design, light, interorganizational meaning

Scientific and societal problem and goals

Although collaboration is deemed critical to meet today's societal challenges, it is often difficult to realize. Sustainable urban development requires new forms and processes of collaboration. This paper examines design as a new process for leading and driving interorganizational collaboration in urban development issues.

Design is here considered a meaning-creating process and it is specifically investigated in co-production of urban places in Gothenburg. Design is a way to drive collaboration, where participatory meaning creation aims at bridging inequality in collaboration and form new common understandings and increased togetherness. Design is, thus, not only a way of forming the physical urban environment, but it also affects behaviour and interaction of people and Groups. The connection between urban environment and urban life is, however, often overlooked in practice, which put sustainability at risk.

The overall research question of this paper is: What is the role of design/designer in temporary interorganizational collaborations for urban development?

This question is addressed by studying the case of the light and art tunnels in Gothenburg. In 2014 the City of Gothenburg initiated the project "Light and Art" to restore nine tunnels in the city, using art, light design and citizen dialogue to transform the space and create safer and more inviting public environments. This is a particularly interesting case to address our question for three main reasons. The first one is that the restoration of tunnels involved the collaboration of many stakeholders of different kinds and with different competences and interests. The second one is that it used light design as a tool to produce the transformation of a physical place, which allows us to shed light to an overlooked type of artefact, namely light. The third one is that this is a particularly interesting case of urban development, inasmuch as it aims to transform a traditional non-place (the tunnels) into a space.

Research process and methods

This paper is based on a qualitative study of case of the project "Light and Art". After mapping the timeline and stakeholders' involvement for each of the tunnels, we chose three tunnels for a closer investigation, based on comparability, the spread over time and space, as well as different work and communication methods in relation to the neighbourhoods and the citizens. All three tunnels have been video-documented in various ways. Documents, interviews and workshops were conducted to collect material on the three chosen tunnels. The analysis of the material is inspired by grounded theory.

Summary of findings, ways towards impact

The preliminary results of our analysis seem to point at the significance of design in temporary interorganizational collaboration in two important ways. First, design seems to transform the space, by light in our case, into a process rather than an artefact. In the studied collaborations, design became an enlightening process, rather than simply

giving light to the tunnels. Second, this process of enlightening, anchored in the light, its functions and experiences, was able to create partially new shared understandings of the tunnels, although, as the case shows, this is never reached once for all. The temporarity of the collaborations stopped the process and the newly designed tunnels went back to be about light (the artefact), rather than enlightening (the meaning-making design process) if not the process was carried further.

PARALLEL SESSIONS II

CAPTURING AND STRENGTHENING SOCIETAL EFFECTS OF TD-RESEARCH (PART II)

Wednesday, 11.09.2019, 13h40 – 15h20
[Wallenbergsalen]

Organiser(s): Martina Schäfer[1], Alexandra Lux[2], Hoffmann Sabine, Verwoerd Lisa, Williams Stephen, Newig Jens, Belcher Brian, Eismann Christian, Claus Rachel, Bergmann Matthias[2]

[1]Center for Technology and Society, TU Berlin; [2]ISOE – Institute for Social-Ecological Research, Frankfurt; [3]Eawag, Swiss Federal Institute for Aquatic Science and Technology, Switzerland; [4]VU Athena Institute; [5]University of British Columbia; 6: Leuphana University, Faculty of Sustainability, Germany; [7]Royal Roads University; [8]Center for International Forestry Research; [9]Intra3

Keywords: effective research, societal efficiency, unintended effects, impact categories, methodological procedures

For detailed description see session part I on Wednesday, 11.09.2019, 10h50 – 12h30.

TRANSDISCIPLINARITY, POLICY, AND PUBLIC INSTITUTIONS (COMPOSED SESSION)

Wednesday, 11.09.2019, 13h40 – 15h20
[Europa]

I. Presentation:

From reflex to reflexivity in governmental expert agencies

Eva-Maria Kunseler[1], Lisa Verwoerd[2]

[1]PBL Netherlands Environmental Assessment Agency; [2]VU Athena Institute

Keywords: reflexivity; knowledge production; expert agency; technocracy; transdisciplinary

Scientific and societal problem: In light of contemporary societal developments – including the rise of transgressing societal issues, polycentric governance structures and the increasing importance of social media – the role of scientific knowledge has diversified and its authority is no longer self-evident. In this paper, we focus on the implications of these developments for the knowledge function of governmental expert agencies that work on the science – policy interface. There is called for a transdisciplinary mode of knowledge production. Yet, in practice these organizations remain largely rooted and organized according to a technocratic ('modern') mode of knowledge production. In this paper, we argue that transdisciplinary research is hard to establish in governmental expert agencies, due to solidified research routines rooted in a dominant 'speaking truth to power' logic [1,2]. This paper proposes a reflexive mode of knowledge production to go beyond the dichotomy between transdisciplinary and technocratic modes of knowledge production. We argue that researchers working in these agencies should be crafted in reflexively attending to the societal issue and the governance arena in which their research takes shape. Reflexivity brings in the acknowledgement of the limits of one's own viewpoint and the appreciation of alternative viewpoints. In this way, governmental experts become more aware of the social and moral implications of their own representations and of the disciplinary, institutional and cultural frameworks they tend to co-produce.

Research process and methods: Literature review enabled us to distill two crucial 'routes' for crafting reflexivity. One route is to strengthen contextual awareness of the political-administrative setting and of the socio-political stakes informing the research topic. Thereby, researchers can more consciously 'fit' their knowledge function to the issue and the arena at hand, effectively reconciling both transdisciplinary and technocratic elements in a way that satisfies the research conditions. The other route is to strengthen quality assurance throughout processes of knowledge production. In this way, researchers can reflexively organise the credibility, legitimacy and saliency of the knowledge, using technocratic and transdisciplinary approaches for quality assurance that effectively supplement one another. Based on an empirical study from 2016 to 2018 at the PBLwe illustrate that – despite aspirations for organising reflexivity – practicing this reflexive mode is challenging. For example, the independent and 'objective' expert position is perceived to be at risk during processes of co-design.

Summary of findings: We illustrate that the 'technocratic' fix in governmental expert agencies is very persistent. A reflex to meet the 'golden' quality standards of modern science is still highly prevalent in expert advisory practice. To alter the epistemic culture and routines of these agencies towards a more reflexive mode of knowledge production,

we encourage a practice of 'learning-by-doing'. We propose that practitioners in public knowledge institutes should actively open up the conversation about their knowledge function, by sharing experiences within their own organizations, with colleagues from other expert agencies as well as with their 'clients' in government and elsewhere. Institutionalising a reflexive mode of knowledge requires, first of all, recognition and problematisation of the 'modern' reflex. Secondly, we suggest that learning activities are crucial for strengthening reflexive skills and capacities.

Ways towards impact: Encouraging reflexivity in government expert agencies innovatively challenges the problematic dichotomy between technocratic and transdisciplinary modes of knowledge production. Via the two reflexive routes presented in our paper, governmental experts can learn to more consciously organize their knowledge function to societal needs and characteristics, and learn to shift roles and approaches according to the situation. Expert authority is not lost in the current 'post-truth' era, but needs to be created – each time anew – by reconciling technocratic and transdisciplinary modes reflexively.

[1] Turnhout E, Dewulf A and Hulme M (2016). What does policy-relevant knowledge global environmental knowledge do? The cases of climate and biodiversity. Current opinion in Environmental Sustainability 18: 65–72.

[2] Van der Hel S (2016). New science for global sustainability? The institutionalisation of knowledge co-production in Future Earth. Environ. Sci. Policy 61: 165-175.

INTERACTION AND/OR INTERGRATION? DISCUSSING PRIORITIES FOR CO-PRODUCTION (COMPOSED SESSION)

Wednesday, 11.09.2019, 13h40 – 15h20
[Antarktis]

I. Presentation:
Interaction versus integration in transdisciplinary research

<u>Dena Monique Fam</u>[1], Ronlyn Duncan[2], Melissa Robson-Williams[2], Zoe Sofoulis[3]

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Keywords: integration, interaction, collaboration, ecologies of knowledge

To address complex 21st century challenges we need interdisciplinary and transdisciplinary research that brings together knowledge and expertise from different disciplines and sectors into processes of framing and analysing problems and developing measures to address them (Mauser, 2013; Stokols, 2006; Rockstrom, 2016). This paper questions the concept of knowledge integration, vaunted as the overarching goal of many interdisciplinary and transdisciplinary projects, and proposes an alternative: a 'knowledge ecologies' approach that brings into view the contexts of knowledge production and highlights the importance of thinking about the interactions that underpin successful knowledge integration. This presentation suggests a necessary precursor to initiating TD projects is to identify the context and environment in which knowledge, knowers and knowledge communities interact with each other – a step often missing in TD project planning.

Integration is often conceived of as reaching a cognitive consensus about a topic by group discussion, or even when some 'social data' is incorporated into a science project. In a positivist perspective on 'integration', different knowledges are treated as lego blocks that combine with other 'data sets' to create a unified structure (Fam and Sofoulis, 2017). These narrow conceptions of integration do not capture its diverse dimensions (Boix Mansilla, 2016), let alone other kinds of interactions between knowledges, including incommensurability. Nor do they appreciate the inherent challenges of making integration work in practice, such as deciding what is or is not counted as 'evidence' in a multi-disciplinary project. Simplistic ideas of 'integration' overlook the influence of social, political and cultural contexts within which integration is assumed to take place, and fail to capture the ontological and epistemic implications of these contexts for knowledge production. They can mislead proponents to think relevant integration has taken place when it is just another case of discursive domination (where positivist science is the Master Discourse).

A knowledge ecologies approach starts with an analogy between biodiversity and epistemological pluralism, where the optimum state is not epistemological monoculture but productive interactions amongst diverse knowers and knowledges. This approach seeks insight into how interactions between different knowledges and knowledge practitioners are shaped by contextual factors: the conditions of knowledge production, the research policy and

funding climate, the distribution of research resources, and differential access to enabling infrastructures, networks and facilities.

Background 'climatic' conditions here include the lower status and much smaller research funding base for the humanities and social sciences, and the tendency of governments and industry to favour technical and scientific forms of knowledge over the cultural intelligence of societal actors which is critically needed to find solutions that are both feasible and socially acceptable. The authors' cumulative years of experience in designing, delivering and managing TD projects in collaboration with diverse actors across industrial sectors and disciplinary fields suggests that these hegemonic contextual factors have the potential to constrain successful integration.

In a conventional problem-centred approach, STEM experts define and identify the problem, and trial and propose a solution, bring other disciplines onto the team as needed, and perhaps at the end commission a bit of social research to help find out how to implement their solution. A knowledge ecologies approach not only encourages a diversity of knowledges and communities of knowers to get together *at the outset* to scope and define the problem (or more likely, cluster of related problems), but it can explore a range of responses and roles different interest groups might have in exploring or implementing solutions. There is no need to reduce everything down to a single 'silver bullet' or 'one size fits all' response.

Vignettes and examples of how the knowledge ecologies framework has been used by the authors in projects/workshops in Australia, New Zealand and Alaska will provide a way of grounding the concept of 'interaction' in practice. Insights are offered on how the framework might be used in project design, planning and evaluation. Finally, we pose the question to the audience as to whether knowledge 'integration' is possible desirable, or overrated, and ask for their suggestions or examples on how to foster productive interaction.

Key readings

Fam, D. & Sofoulis, Z. 2017, 'A Knowledge Ecologies analysis of co-designing water and sanitation services in Alaska', *Science and Engineering Ethics*, Vol. 23, Issue. 4, pp. 1059-1083.

Duncan, R. 2016. Ways of knowing – out-of-sync or incompatible?: framing water quality and farmers' encounters with science in the regulation of non-point source pollution in the Canterbury region of New Zealand, *Environmental Science & Policy*, 55: 151-157.

Brugnach, M. and Ingram, H., 2012. Ambiguity: the challenge of knowing and deciding together. *Environmental Science & Policy,* 15(1), pp.60-71.

II. Presentation:

Tracing the engagement of actors: The influence of rationales and infrastructure of transdisciplinary team formation

Kerstin Hemström[1], Merritt Polk[2], Henrietta Palmer[1]
[1]Chalmers University of Technology; [2]Gothenburg University

Keywords: Transdisciplinary teams, Rationales, Infrastructure, Participation

Transdisciplinary and co-production research strives for collaboratively based knowledge processes in which academic researchers come together with other actors to share and create knowledge that can be used to address the sustainability challenges of today, while increasing capacity for societal problem-solving in future. A key issue is to form a transdisciplinary team, motivated by the desire to solve a reality-based problem. Ideally, everyone who has something to say about the problem and is willing to participate can play a role, from defining the problem area and research design, to exploring and realizing results.

Mistra Urban Futures is an international centre for sustainable urban development created in response to the need for new organizational forms that can blend knowledge and expertise within and across urban contexts. It operates through local interaction platforms in different cities, where local scientific and extra-scientific partners come together to facilitate and create favourable conditions for transdisciplinary co-production research projects. The core mission is to generate and use knowledge to support transitions towards sustainable urban futures (Polk, 2015; Perry et al., 2018). In this process, the engagement and participation of different actors is a key concern.

This presentation builds on a paper in which we trace rationales and infrastructures for participation in Mistra Urban Futures, discussing how they shape the enactment of transdisciplinary co-production research. To guide this investigation, we apply a framework developed by Metzger et al. (2017) which sheds light on how the situated interplay of rationales and infrastructures for participation determines who (and what) gets enacted as legitimately concerned. Based on empirical material related to the local interaction platform in Gothenburg, we use this

framework to sketch out rationales and processes that enact legitimate concerns in different situations and at different functional levels; among those enabling the research to take place, and those performing it in practice. This will lead us to a discussion on how the formation of transdisciplinary teams, typically motivated by a reality-based challenge, occurs in a social space where several interests and underlying rationales (e g political, cultural, epistemological, representational, economic and scientific) and infrastructures for participation interact. In the research project, the enactment of rationales is conditioned by the infrastructures set up at other functional levels (e.g., the platform, the funders, and the partnering organisations) as well as by the design and practice of the project. This may be an intrinsic condition for transdisciplinary coproduction research in this setting, ultimately influencing the potential to meet overarching rationales, and reach societally relevant and legitimate results.

References

Metzger, J., Soneryd, L. and Linke, S. 2017. Enacting Legitimate Concerns: An Agnostic Approach to Stakeholder Participation in Planning Processes. *Environment and Planning* A 49(11): 2517–2535

Perry, B., Patel, Z., Bretzer, Y. N., & Polk, M. 2018. Organising for Co-Production: Local Interaction Platforms for Urban Sustainability. *Politics and Governance* 6(1): 189 https://doi.org/10.17645/pag.v6i1.1228

Polk, M. 2015. Transdisciplinary co-production: Designing and testing a transdisciplinary research framework for societal problem solving. *Futures* 65: 110–122. https://doi.org/10.1016/j.futures.2014.11.001

III. Presentation:

What shapes stakeholders' participation in transdisciplinary workshops? Towards a sociological concept of knowledge and interaction

Maurice Skelton[1], Christian Pohl[2]

[1]ETH Zurich/MeteoSwiss; [2]ETH Zürich

Discussions on transdisciplinarity (td) and sustainability praise knowledge integration in face-to-face participation as a central element and core process. This presentation explores two often seperated challenges to such endeavours, and argues that they are in fact closely linked: (a) actors differ in recognising the relevance of a td topic for their work; and (b) actors differ in their willingness to discuss a certain topic within a td setting. Using a Swiss case study on 'urban heat' – which will increase with climate change – we empirically trace how these two challenges shape who participates in td workshops how.

(a). We conducted n=25 semi-structured interviews with experts from five sectors. These interviews give insights into how these actors perceive 'urban heat' and how it relates to their work. For instance, experts on building technology or urban greens gave detailed examples. Health specialists, however, often admitted that they haven't considered the impact of urban heat yet.

(b). We invited interviewees to participate in n=2 td workshops. Participation was highest in those sectors recognising urban heat as an issue. Due to the topic's relevance, some interviewees even asked if further colleagues could participate. Health experts, however, declined the workshop invitation most often. Two reasons were given for non-participation: First, experts didn't recognise the topic's relevance. Second, a minority declined because they didn't approve of the style of discussion. Notably, one building technologist was unwilling to have open-ended discussions within an informal setting. He is very active as a project advisor, preferring thus formal settings with higher within-sector visibility and acknowledgement.

The challenges (a) and (b) can be rephrased as: How do people recognise relevant knowledge, and how does this knowledge influence social interactions? Sociological studies have highlighted the social dimension of knowledge transfer throughout the last century (cf. Durkheim, Fleck, Merton, Kuhn, Douglas, Latour). For instance, interviewees responded to the question 'how does urban heat relate to your work?' differently. The similarity of answers among building technologists or urban green specialists indicates a shared 'thought style' (Fleck). However, responses were often different among spatial planners or health officials. Two key aspects seem to drive this behaviour: (i) whether a key variable (e.g. temperature) is present in individuals' 'thought style'; and (ii) whether the td topic serves as a justification for individuals to continue their work similarly (or if the td topic constitutes 'uncomfortable knowledge' (Rayner 2012)).

Both (i) and (ii) apply to the sectors green space and building technology. These participants felt 'comfortable' participating in the td workshop on urban heat, gaining within-sectoral visibility and extra-sectoral legitimacy for their work. For health, on the other hand, neither (i) nor (ii) applies. While many health practitioners didn't recognise heat as an issue, integrating urban heat would likely challenge current health priorities too.

Most people prefer approval to criticism. Microsociology has studied how people try hard to ensure a 'good' self performance in face-to-face engagements. If participants don't meet both (i) and (ii), this public self performance is more difficult to achieve. Thus, analysing why people participated in (or dropped out of) workshops highlights how interconnected knowledge and social interactions are.

If sustainability is the goal, our results imply discussing the extent in which td workshops are able to integrate 'comfortable knowledge' with 'uncomfortable knowledge' more seriously. Or put differently, as face-to-face interactions are so delicate, in what form is critique possible in td workshops? Due to the dynamics of knowledge and interaction discussed here, maybe closed discussions within a sector are more adequate for 'uncomfortable' topics – at least to begin with.

ASSESSING CO-PRODUCTION AND STEAKHOLDER ENGAGEMENT (COMPOSED SESSION)

Wednesday, 11.09.2019, 13h40 – 15h20
[Sydamerika]

I. Presentation:
Collaborating for sustainability: the lived experience of citizens and scientists in transdisciplinary research projects - New stories from Germany and Portugal

Antje Disterheft[1], Tomás B. Ramos[1], Georg Mueller-Christ[2]
[1]Center for Environmental and Sustainability Research (CENSE), Department of Science and Environmental Engineering, Universidade NOVA de Lisboa, Portugal; [2]2Faculty [7]Business Studies and Economics, University of Bremen, Germany

The complexity of global challenges on social, economic, and environmental level require new forms of knowledge production and new ways of doing research. In the search for sustainability of socio-ecological systems, sustainability science emerged as a transdisciplinary field aiming to generate actionable knowledge and evidence-supported solution options for complexity, uncertainty, and socio-political controversy. Sustainability scientists seek to go beyond descriptive-analytical approaches and enter into dialogue and mutual learning processes with societal stakeholders, because a transition towards more sustainable societies should be undertaken collaboratively. While pursuing societal transformation together with scientific breakthroughs, researchers are testing new forms of engagement in science-society interfaces. Universities have a fundamental role to promote sustainability and started to engage in sustainability science, a transdisciplinary field of mutual learning processes in science-society interfaces. While inter- and transdisciplinary research approaches are required, usually with a participatory dimension, there are several gaps experienced, e.g. little knowledge how to conduct effectively these research processes and the necessity for more empirical knowledge about their effectiveness and impact on sustainability transitions.

The present work is integrated in a postdoctoral research project that focuses on narratives of transformation and capacity building within sustainability transition processes. It is guided by the TRANSFORM framework for transformational sustainability research from Wiek and Lang (2016) and integrates foresight and backcasting as well as systemic constellations to inform intervention research strategies. The research process is divided into three phases and uses a Portuguese and a German faculty/university as cases to investigate their interactions with local communities, addressing a main guiding research questions in each phase: (Phase I) What have been the approaches in moving forward towards participatory sustainability research between science and society? (Phase 2) How to overcome experienced difficulties/gaps in inter-and transdisciplinary research and make collaborative efforts more effective? (Phase 3) How to improve science-society interfaces for sustainability on a long-term perspective?

First results from Phase 1, including a questionnaire survey and interviews with participants from academia and civil society about their lived experience in these transdisciplinary projects will be presented. The work aims to offer answers and insights related to the question about experiences in transformation processes as well as related to methodic approaches, skills and competencies needed for sustainable outcomes.

Key readings:

Wiek, A., and Lang, D.J. (2016). Transformational Sustainability Research Methodology. in Harald Heinrichs, Pim Martens, Gerd Michelsen & Arnim Wiek (Eds.), Sustainability Science: An Introduction (pp. 31-41). Dordrecht: Springer Netherlands. http://dx.doi.org/10.1007/978-94-017-7242-6_3

Wittmayer, J.M., and Schäpke, N. (2014). Action, Research and Participation: Roles of Researchers in Sustainability Transitions. Sustainability Science, 9(4), 483-496. doi: 10.1007/s11625-014-0258-4

II. Presentation (short):

Initial involvement of stakeholders in transdisciplinary projects - exploring issues of expectations, roles and inclusion

Helena Kraff[1], Eva Maria Jernsand[2], Lillian Omondi[3], Emma Björner[4], Sayaka Osanami Törngren[5]

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Keywords: complexities, expectations, roles, inclusion, initial involvement

This paper identifies complexities of transdisciplinary research, focusing on the initial involvement of stakeholders early on in the process, and the pressures that highly collaborative environments give rise to. The initiation and launch of a transdisciplinary project exploring the role of tourism in multicultural societies serves as an illustrative example of these pressures. The combination of two fields, tourism and migration studies, which are normally situated far apart from each other, implies a need for a highly diversified constellation of project actors. This, and the aim of transdisciplinary research to be transformative, raise expectations and create tensions between the involved public, private, civil and academic actors.

The purpose of this paper is to identify central complexities and tensions in the initial stages of projects that hinder prosperous, functional and robust collaboration. Challenges in transdisciplinary projects are to a large extent closely connected the specificity of the particular context and actor constellation. However, previous research, the empirical example, and the authors experience of engaging in such projects in numerous settings, illustrate how issues of expectations, language, roles, inclusion and exclusion, agency and power dynamics tend to emerge, although in different forms, independent of project type.

Participatory observations during the project launch of the empirical example, where 35 stakeholders participated, show how participants saw opportunities in experimenting with the intersection between tourism and multiculturalism and envisaged synergy effects. However, the multidimensional nature of both concepts presented challenges in finding a common understanding and drawing meaning. This therefore meant that expectations on the outcome of the project varied greatly, ranging from highly academic, which can influence a broader audience, to localized practical results, such as products, tools and methods for inclusion and successful development. The large number of stakeholders also meant that expectations exceeded the range of case studies, as well as organisations and individuals possible to involve and consider. Extreme efforts would need to be taken to keep contact with all proposed partners.

This connects to the language barrier that derives in collaborative projects, where actors find it hard to understand each other's disciplinary expressions. During the launch, issues of language also emerged in connection to its international and multicultural nature, which exemplified how language preludes notions of inclusion and exclusion. The launch was held in Swedish since all present public and private partners were Swedish. This did however exclude one of the international researchers in the project from most parts of the presentations and discussions. Also, concerns were raised that an important stakeholder group, newly arrived immigrants, whom may have difficulties with both Swedish and English, were fully excluded from the launch.

Research is traditionally the responsibility of universities and hence, many stakeholders coming into transdisciplinary projects experience role confusion, where they are not clear on what they are expected to contribute with or deliver. Some stakeholders may also take passive roles and sit back, with expectations of a report once the project is finalized.

To conclude, the multifaceted nature of transdisciplinary projects enables you to view issues from a multitude of perspectives, providing possibilities to reach desired outcomes relevant for all stakeholders. Having a project launch enables you to recognize the perspectives of stakeholders which often are overlooked. A launch is however not

enough, and it is imperative to provide platforms to continue dialoguing on the pertinent issues and tensions that come to the surface during initial stages of a project.

III. Presentation (short):

The MAZI transdisciplinary process

Ileana Apostol[1], Panayotis Antoniadis[1], Gareth Davies[2], Mark Gaved[2], Andreas Unteidig[3]

[1]NetHood, Zurich, Switzerland; [2]The Open University, UK; [3]Berlin University of the Arts, Germany

Keywords: DIY networking technology, co-design process, boundary object, cross-fertilization, self-reflection

MAZI, meaning 'together' in Greek, is a recently concluded Horizon 2020 transdisciplinary research project exploring DIY networking technologies <mazizone.eu>. Between 2016 and 2018, the emerging MAZI toolkit --a collection of user-friendly guidelines, software and stories of practice-- was placed as a 'boundary object' among a highly diverse consortium. This included researchers, activists, technologists, academics and artists, all of whom played various roles at different moments during the project. They co-produced the MAZI toolkit, to empower groups and individuals to build and control their own local community wireless networks. This paper presents the transdisciplinarity in MAZI, aiming to address some knowledge gaps related to process' documentation, and the formation of structures and spaces for cooperation.

The working process derived from the project topic itself, co-designing the MAZI toolkit. Design being understood as a counterplay of raising issues and dealing with them, a practice-focussed approach to MAZI materialized in reiterations of applied research in local pilots. The community partners coordinating the pilot activities were an integral part of the research process. A spiral-shaped process was conceived as a series of iterative loops of: work in local pilots - cross-fertilization events - self-reflection exercises - answers' interpretation - work in plenary meetings and deliverables - pilots' evaluation - work within pilot teams. The object of design was produced in a 'back-and-forth' process between generic, weakly structured forms of the MAZI toolkit, and strong versions in specific, locally defined pilots and toolkit deployments.

However, cooperation within a process of hybrid space design that took place across localities, cultures and disciplines meant a substantial part of the project was focused on shaping mutual understandings of basic assumptions, world-views and methodologies. It was therefore critical to generate a common space for inter- and transdisciplinarity, and the project dedicated a specific 'work package' to this end. Since the project's conception, transdisciplinary cooperation was stimulated through distributed roles and responsibilities regarding (self-)reflection, evaluation, dissemination, coordination and process framing. Collective learning was a critical aspect, and the consortium elaborated extensively on 'DIY networking', worked on collective narratives and ways to present the ideas developed in MAZI to other research and action communities.

Among the core challenges in transdisciplinary research are the inherent tensions between research and action, which come together with stimulating synergies, and may function as catalysts for action. A related and similarly important topic explored in MAZI was the ambiguity of roles played by the partners, and their necessary and continuous adjustments, implied negotiations and adopted tactics. In MAZI there were at least three levels of negotiations between design-related disciplines; researchers and activists; and researcher-activist pilot teams and technologists. These topics received particular attention throughout the project, being investigated through surveys, interviews, hands-on workshops, cross-fertilization events and literature research. Based on reflection-in-action, the MAZI process included frequent self-reflective exercises as a contractual project outcome. This methodology generated useful documentation, facilitated the transdisciplinary process, and may add a qualitative processual perspective to transdisciplinarity.

This paper illustrates the MAZI transdisciplinary process through a) a shared vocabulary, b) cross-fertilization events followed by (self-)reflective exercises and surveys, c) an evaluation framework for the pilots, d) a discussion of the MAZI transdisciplinary framework, and e) commonly shaped spaces for transdisciplinarity, which potentially will extend beyond the project timeframe. All in all, in MAZI the research paradigm generated scientific knowledge transferable and applicable to address real-life problems. The project's framing on knowledge transfer had mainly a sustainability background, based on the premise that knowledge is not a finite product, but rather a dynamic multi-view agreed-upon process.

IV. Presentation (short):

Lessons from a co-design process: how early involvement of local people can enrich the coastal management process

Floortje Marijn d'Hont, Jill Hillary Slinger

Delft University of Technology

Keywords: coastal management; participation; co-design; policy analysis

To maintain the coast, to protect land against the sea, and to build infrastructures that provide a desired living environment now and in the future, Dutch coastal management has traditionally involved collaboration between different social actors, researchers, engineers, and decision-makers. In the last few decades, coastal management in the Netherlands has shifted towards even more community engagement in coastal decision-making. However, usual forms of stakeholder engagement rarely invite community stakeholders to join the idea generation phase. Indeed, the current trend in decision-making along the coasts has faced challenges in embracing local knowledge.

In this paper, we explore what happens when we let local citizens design possible future visions, and subsequently, let a group of interdisciplinary professionals use that input to find feasible solutions for a coastal management problem. This specific co-design process was tailor-made to fit the local context of the South Western part of Texel, the Netherlands, and included three activities in which researchers, policy-makers and local stakeholders participated.

In the first workshop, local stakeholders were asked to co-design utopian and dystopian future visions about their island. Their rated visions were analysed to understand the associated local values. Participants encouraged to build a broad systems view, using the geoscientific and institutional knowledge presented. In a second workshop, professionals with specialized expertise relating to coastal management, engineering, and research were informed on the underlying stakeholder values, before they joined to develop feasible solutions to achieve the future utopian visions. The professionals offered packages of intervention measures relating to the technological, ecological, policy and institutional domains over temporal horizons of 30 to 50 years. The proposed interventions focus on using nature-based solutions, but agreed that challenges for implementing these lie in the policy and institutional domains. For example, technological solutions such as "pop-up infrastructure" to accommodate natural dune dynamics exists, but coastal regulations do not always allow for these innovations. In a third workshop, participants validated their values as interpreted by the professionals, but were slightly disappointed with the quality and depth of the proposed solutions. As such, the eventual workshop output can be regarded as the product of the network of engineers, local stakeholders and scientists from social and natural backgrounds.

From this experience, we have learnt that building shared system understanding among participants can lead to rich discussions, consensus and appreciation for the collaborative activity itself. We learned for example that while decision-makers assumed a beach pavilion had to be protected by the flood defence, the beach pavilion owner would be happy to consider relocating. In similar ways, the designed future visions for Texel enriched later discussions among professionals about intervention strategy alternatives. We learnt that professionals can stifle discussions by dominating local stakeholders in group dynamics. Separating these people proved to be fruitful for the creativity of the local stakeholders. Additionally, to do socio-technical design properly, lack of resources (time and money) constrain the room for creativity.

In conclusion, we hypothesize that embracing local values and perspectives earlier in the idea generation process, can result in a broader design space that offers a wider range of possibilities and more desirable future alternatives. Moreover, we note that further research to transdisciplinary approaches to coastal policy making should consider including citizens, as well as professionals from different expertise backgrounds. We believe there is explicit room for transdisciplinarity to improve the efficacy of solutions for coastal management and policy making.

V. Presentation (short):

Exploring what makes co-design salient, legitimate and credible for the stakeholders involved in a transdisciplinary project on nature-based solutions and urban innovation: Lessons learnt from a DELPHI survey

Claudia Basta, Eva Kunseler, Clara Veerkamp, Ed Dammers, Ton Dassen

Netherlands Environmental Assessment Agency

Keywords: nature-based solutions, saliency, credibility, legitimacy, indicators, stakeholders' dialogues

Scientific and societal problem: Much of the literature on sustainable urban development tackles the challenge of identifying indicators capable of capturing the contributions of urban projects and programmes to identified sustainability goals [1]. Less attention has been accorded to the credibility, saliency and legitimacy of such indicators

from the perspective of the stakeholders called to use them in their professional practice. In the vast literature on transdisciplinary approaches to knowledge-production, it is generally agreed that these attributes characterize co-creative processes in which actors with multiple backgrounds and roles collaborate to the conception of applicable solutions to identified problems [2]. Whilst advancing methods for evaluating these attributes in robust and reliable ways is particularly important for the so-called 'boundary-organizations' called to steer extended processes of social transformation – like e.g. social and environmental assessment agencies and NGOs – such evaluations remain complex exercises to which current literature offers little support.

Process, materials and methods: In this paper, we present the preliminary outcomes of the evaluation of credibility, saliency and legitimacy from the side of the stakeholders involved in the identification of indicators for assessing the contributions of nature-based solutions (NBS) to urban sustainability challenges. The relevant co-design process and the *ex-post* evaluation object of this paper are part of a European project on NBS and urban innovation (NATURVATION). More specifically, the *ex post* evaluation is relative to the process of co-design of the Urban Nature Index (UNI) for which the mentioned indicators were collaboratively identified and selected. The first part of the paper illustrates the process of co-design of the UNI by focusing on two stakeholders' dialogues organized in Utrecht (The Netherlands) and Malmo (Sweden) in 2018. The second part of the paper reports the preliminary outcomes of a DELPHI survey designed in early 2019 for distilling 'lessons learnt' from the stakeholders involved in the dialogues regarding the credibility, saliency and legitimacy of the respective outcomes.

Perspective findings: The third part of the paper reflects on the preliminary results of the DELPHI survey. The reflection focuses on questions of robustness, reliability and replicability of the methods applied for shaping the described co-design process and securing its legitimacy, saliency and credibility for the stakeholders involved in it.

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MORE THAN TEACHING – TRANSDISCIPLINARY CAPACITY BUILDING II
(COMPOSED SESSION)
Wednesday, 11.09.2019, 13h40 – 15h20
[Nordamerika]

I. Presentation:
Conceptual and Methodological Advances in Transdisciplinary Team Science Training

Stephen Martin Fiore[1], Troy Hartley[2], Linda Schaffner[2], Karen McGlathery[3], Deborah DiazGranados[4]
[1]University of Central Florida; [2]College of William & Mary; [3]University of Virginia; [4]Virginia Commonwealth University
Keywords: training, education, collaborative problem solving, coastal resilience, environmental sustainability

Solving today's most challenging societal problems requires innovative, integrated breakthroughs and novel solutions that transcend individual disciplines, reaching a deeper level of knowledge integration. However, achieving such integration through team science is challenging due to the lack of adequate training to develop such outcomes. To address this, methods from allied disciplines need to be adapted for use in training future transdisciplinary researchers. This presentation, aligned with the "methodological innovation" stream, discusses a research project focused on coastal resilience in the Chesapeake Bay region of the USA as its "site for change". It brings together a multidisciplinary team of scholars from the College of William & Mary Virginia Institute of Marine Science, the University of Virginia Environmental Resilience Institute, the Cognitive Sciences program at the University of Central Florida, and Virginia Commonwealth University.

First, to help universities promote collaborative learning, a team of faculty coaches was recruited to guide a class of diverse doctoral and master's students from the natural and physical coastal, marine and environmental sciences, engineering, design, and social and economic sciences. Second, to develop and test different types of transdisciplinary pedagogies, a series of workshops was developed to train students on the fundamentals of team science as well as collaborative knowledge building on complex transdisciplinary problems. Here, we emphasize the development of conceptual models that are capable of capturing system level problems as well as integrating diverse

disciplinary perspectives. Third, to foster individual and team learning, an intervention focusing on reflection in teamwork processes is used to ensure students monitor both the task of transdisciplinary problem solving, as well as the teamwork processes engaged while collaborating.

In combination, graduate students are introduced to the principles of team science, collaborative problem solving, and effective self-reflective tools and strategies. Additionally, students gain experience working with coastal community partners (e.g., municipalities, NGOs). As such, this community-based climate-resilience project enables students to practice team science research and use reflective practices to improve their competencies with various stakeholders. Assessment of team processes, along with reflections on teamwork and taskwork was used iteratively in order to highlight areas of collaboration needing improvement.

Our project is designed to improve understanding of how to nurture self-reflective competencies in the short-term and build capacity for team science research that will enhance students' careers over the long term. Specifically, our goals are to: (1) give a new generation of scientists and policy-makers the knowledge and critical skills they need to work together effectively to find solutions to complex coastal issues that are important to the citizens of Virginia, the nation, and coastal communities around the globe; (2) provide an opportunity for graduate students to work with stakeholders on complex interdisciplinary collaborative problem solving and learn how to work as a team across disciplines; and, (3) provide collaborative institutions an unprecedented opportunity to partner and bring together multi-disciplinary faculty teams to train students using innovative workshops focused on community-based coastal resilience issues. Initial findings will be reported, including differences between reflections on teamwork and on taskwork, and the particular challenges graduate student participants faced when working on complex problems.

II. Presentation:

Challenge Lab – A strategic approach for transdisciplinary university-society interaction to navigate sustainability transitions

<u>John Holmberg</u>, <u>Johan Larsson</u>
Chalmers University of Technology

Keywords: student engagement, sustainability transition, lab

Challenge Lab is a space and process for strategic transdisciplinary university-society interaction to navigate sustainability transitions. It creates space for studets from different master programs and cultural backgrounds to learn, exercise and develop leadership for sustainability transitions in multi-stakeholder settings. The students apply a backcasting-from-principles methodology and related tools including values-clarification, dialogue, systems thinking and entrepreneurship.

The basic idea with Challenge Lab is that students have unique capabilities to bring stakeholders together, build trust and create conditions for sustainability-driven innovation. The students do so in the four main steps of (1) framing conditions for a sustainable future on a level of principles, (2) analysing the present situation in relation to the principles to understand gaps and challenges in the tension present-future, (3) identifying leverage point interventions in the gap, and (4) create strategies for realising the leverage point interventions. The leverage point interventions are often identified as complex 'in-between questions' in relation to the sustainability challenges, that no actor in society can govern through their own activities. The students can in these in-between spaces play a neutral role and bring stakeholders together representing a diversity of perspectives. Further, students are often motivated and enthusiastic about moving issues forward, are eager to change and hosts a curiosity that spills over on the involved actors. In previous research we have been able to identify that students engaging in Challenge Lab develop unique sustainability transition leadership capabilities while also creating value in society.

This presentation will provide (1) an overview of the Challenge Lab methodology, including (i) its way of contributing to sustainability transitions in society; (ii) its 'whole-of-university' approach positioning it as an integrator of main university functions of research, education and utilization, and; (iii) its way of bringing students from different disciplines and backgrounds together. This will be followed by (2) an overview of students' and stakeholders' learning experiences and design considerations from two cases currently working with the Challenge Lab methodology, being (a) Chalmers University of Technology in Gothenburg around local and regional sustainability challenges related to mobility, food/health, and energy/materials.

III. Presentation:

Transdisciplinary pathways for systemic change in Small Island Developing States – lessons learned in a Sustainability Learning Lab in the Seychelles

Pius Krütli, Danny Nef, Michael Stauffacher

Transdisciplinarity Lab - TdLab, Dept. Environmental Systems Science of ETH Zurich

Keywords: Small Island Developing States; Transdisciplinary Case Study; Sustainability Learning Lab; Seychelles

Small Island Developing States (SIDS) like the Seychelles face a number of economic, social and environmental challenges. They are small in size and remote; often comprising a huge number of islands spread over a large sea area, that is difficult to manage; particularly vulnerable to climate change effects such sea level rise; highly dependent on the international markets and vulnerable to economic shocks; and often lack the capacity and the resources to properly manage basic issues such as e.g., waste management. Therefore, sustainable development is crucial to the Seychelles and is emphasized in many significant official documents written in the Seychelles.

To understand and promote sustainable development in the Seychelles, the TdLab at ETH Zurich, the University of Seychelles (UniSey), and the Ministry of Environment, Energy and Climate Change (MEECC) developed a collaboration in teaching and research. The three partners decided to start their joint activities with transdisciplinary case studies (tdCS) on solid waste management (SWM) which poses a significant challenge for the Seychelles. Master's and bachelor's theses, internships, and local courses would complement tdCS activities at a later stage.

The case study was developed as a joint research-based teaching activity of the TdLab and the Environmental Sciences Program at UniSey. For UniSey (BSc level), the case study is a placement provision, giving students the opportunity to conduct field research while for ETH master's students it is an elective 7 ECTS course to learn how to tackle and solve a complex real-world problem. The two tdCS in 2016 and 2018 provide a comprehensive overview of the current SWM system, potential strategies to reduce waste and options for a future waste management system. Students intensively engaged with a huge number of stakeholders from the public and private sectors as well as civil society. An Advisory Board of local experts guided students throughout their studies. In total, more than 500 locals were directly involved as interview partners, experts, workshop participants, survey participants, etc. Regular media presence in local newspapers informed the public at large about the research activities and two scientific reports after intensive discussions were handed over to the Minister of MEECC (see Lai et al., 2016; Krütli et al., 2018). These studies are used by corresponding administrations, and form a solid data base for the design and implementation of upcoming waste management strategies such as for example waste-to-energy. First actions based on our studies have already been taken and study results will directly feed into a solid waste master plan.

Reflecting on now four years in existence of our sustainability learning lab in the Seychelles (see Krütli et al., 2018), we see that agreements of collaboration form the formal backbone of the collaboration. They envisage a variety of possible engagements. However, crucial insight is that a long-term engagement form ETH Zurich is indispensable because capacity and personnel resources to implement what many studies suggest are widely lacking. Accordingly, the support of decision makers and administration in their implementation activities by regular formal and informal events such as workshops, consultancy, master's and bachelor's theses, internships, and expertise is needed. This reflects a fundamental paradigm shift of current research approaches which very often end when analysis has been done. We discuss our own experiences by contrasting them with the principles for transboundary research partnerships as stipulated by the Swiss Commission for Research Partnerships with Developing Countries (KFPE 2012).

Our sustainability learning lab, a platform to analyze, test, implement and monitor sustainable solutions, is now well underway and frames various future activities in sustainability related field such as conservation, transport, agriculture, tourism, and planning.

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IV. Presentation:

Transdisciplinary learning: Exploring and testing different pedagogical approaches in a transdisciplinary learning context

Merritt Polk[1], Henrietta Palmer[2]
[1]University of Gothenburg; [2]Mistra Urban Futures

Keywords: learning, transdisciplinary, pedagogy

The recent explosion of journal articles, books and conferences bears witness to the increasing popularity of transdisciplinarity (TD) approaches within participatory approaches to making science more accountable to the challenges of sustainability. This popularity rests upon the assumption that 'wicked' problems require new types of knowledge production that can harness a diversity of knowledge and expertise, a plurality of values and needs from the problem context, as well as facilitate the implementation of possible solutions. What types of knowledge and skills do participants need to live up to such assumptions? This paper presents an analysis of a PhD course that was given at Mistra Urban Futures in 2018-2019. This course focused on the knowledge and skills that are needed both when participating in TD projects as well as when initiating or leading them. The course was designed as a transdisciplinary course in that it targeted both practitioners and PhD students, and their respective needs when participating in TD projects. The course developed a TD-pedagogy as a space organised for different types of TD learning situations. These situations include learning across disciplines and knowledge cultures (practitioners and academic), peer learning among PhD students and practitioners, learning across cultures of practice and 'silos', co-learning from practice-based case studies, student-teacher co-learning, and learning from real-life contexts and strategic documents. This paper presents the results from these learning spaces and places them in the wider context of sustainability related learning pedagogies.

POSTER SESSION (PART I)

Wednesday, 11.09.2019, 13h40 – 15h20
[Foyer/Lobby]

I. The Health Protection Research Unit in Respiratory Infections: A case study of transdisciplinary research in England.

Luis C. Berrocal-Almanza[1], Grace Smith[2], Maria Zambon[3], Ajit Lalvani[1,4]
[1]National Institute for Health Research, Health Protection Research Unit in Respiratory Infections, National Heart and Lung Institute, Imperial College London. London, UK; [2]Tuberculosis Unit, TARGET, National Infection Service, Public Health England, London, UK; [3]National Infection Service, Public Health England, London, UK.; [4]Tuberculosis Research Centre, Respiratory Medicine, National Heart and Lung Institute, Imperial College London, St Mary's Campus. London, UK

Keywords: health protection, influenza, tuberculosis, collaboration

Health Protection Research Units (HPRUs) are partnerships between universities and Public Health England (PHE) and act as centres of excellence for health research. The role of the HPRUs is to support PHE in delivering its objectives for the protection of the public's health in key topic-based priority areas. The funding is provided by the National Institute of Health Research (NIHR) for a five-year period following an open competition. The NIHR HPRU in Respiratory Infections at Imperial College London (ICL) supports PHE by designing, conducting and sharing multi-disciplinary research. Our goal is to protect and improve the public's health through better application of cost-effective public health interventions. Research topics selected for HPRU are those considered by PHE which require greatest investment to deliver public health benefits. We are a hub of expertise in all areas of laboratory, public health, epidemiology, health-economic sciences, qualitative research and behavioural psychology.

As a new model of collaboration between government and academia it required a novel administrative framework. We established an official research collaboration agreement and hold launch meetings for all theme leaders, collaborators and stakeholders to facilitate systems development and processes for administration. We hold governance meetings according to terms of reference and appointed an Independent Scientific Advisory Board (ISAB). We have a Patient and Public Involvement (PPI)/Patient and Public Engagement (PPE) strategy that includes

the appointment of lay members to our ISAB and the establishment of a patient and public panel that provides insights to our research projects. The outputs from the partnership are measured in various ways, but are intended to be highly translational as well as delivering new scientific knowledge.

A key element of the partnership is the seamless interaction between academia and public health delivery, providing a vehicle for training the next generation of public health scientific leadership confident to cope with the complexity of emerging health problems. By bringing together scientists from different disciplines to focus on respiratory infections we achieve the deepest impact on the health of the public and provide high-quality research for evidence-based decision-making and translate our findings into tangible benefits for patients and the public. The major challenges are to meet both PHE's primary remit of service delivery priorities and ICL research-based priorities. It takes time to build a fully-functioning academic-government collaboration and for senior management to co-ordinate activities, finances and planning across broad studies and two organisations.

Our scientific results and outputs have had great impact on policy making and public health practice to tackle influenza and tuberculosis. For tuberculosis control PHE and the NHS are investing £50 million in five years in a Latent TB Infection (LTBI) screening and treatment programme for new-entrant migrants. We established a framework to use available datasets to identify and invite eligible migrants for LTBI screening. We evaluated the effectiveness of the pre-entry active TB and post-entry LTBI screening programmes and showed their positive impact on reducing TB incidence in the UK. Because the LTBI programme effectiveness may be compromised by delayed migrants' healthcare access, we engaged with civil society stakeholders to uncover barriers and enablers, and to find novel service models to maximize its effectiveness.

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II. CoNavigator - a tool for interdisciplinary collaboration and problem-solving

David Earle, Line Hillersdal, Katrine Lindvig

CoNavigator IVS

Keywords: CoNavigator, Interdisciplinary collaboration, problem-solving tool

In this session we present CoNavigator – a tool designed to help interdisciplinary groups to collaborate on a 3-dimensional visualization of the interdisciplinary topography of complex themes or problems. It addresses the contextual and local circumstances and unique combinations of members in collaborative themes. CoNavigator therefore refers to navigation of both collaboration and context. It aims to ensure shared understandings, democracy of ideas and opinions, and identify both common and uncommon ground between participants. Teams can choose between specific groups of methodological steps, which are dependent on the contextual nature of the session. We will demonstrate how the tool might be incorporated into the methodologies of other long-term multidisciplinary collaboration systems such as the NCI Charrette System™.

As part of the session, participants will get a chance to see, feel and test the physical CoNavigator tool and some of the digital components, currently under development. We will address the research findings that each individual step of CoNavigator builds upon and thus show how a physical, tactile tool can be a crucial part of the facilitation of an interdisciplinary collaboration or problem-solving.

We expect the session to be a venue for sharing ideas, comparing methods and that it potentially could kick-start collaborations with other developers, practitioners and researchers, working with methods for interdisciplinary collaboration and problem-solving.

III. The Stage Model of Self-Regulated Behavioural Change and its Contributions to Sustainable Transformations

Charis Eisen, Jana Köhler, Anna Keller, Daniel Hanß, Silke Kleihauer, Nathalie Wendorff
University of Applied Sciences Darmstadt

The aim of this presentation is to discuss the potential contribution of a psychological theory – Bamberg's stage model of self-regulated behavioural change – to analysing, evaluating and promoting individual behaviour change. Within the theory, change from a current behaviour towards pro-environmental behavioural alternatives is modelled to take place in four qualitatively different stages (predecisional, preactional, actional, and postactional) which are each influenced by psychological constructs taken from theories previously established to describe and predict pro-environmental behaviour. Consequently, the factors that influence an individual's advancement towards behavioural change are determined by the stage the individual is currently in.

To assess the contribution of the theory to sustainable transformations, we performed a systematic literature search to retrieve peer-reviewed model-based studies and analysed the application of the theory in 10 studies published between 2013 and 2018. Six of the studies employed a cross-sectional, three an interventional and one a correlational longitudinal design. The behavioural domains vary between changes in transportation means, food choice and purchase decisions.

The cross-sectional and longitudinal studies generally supported the model, although there were some irregularities that warrant further investigation. The interventional studies found theory based stage-tailored informational measures to be more effective than non-stage-tailored measures in promoting behavioural change. Furthermore, we identified several challenges that researchers may face when applying the stage model of self-regulated behavioural change. These include whether and how to analyse multiple behavioural alternatives; how to address the challenge of measuring a comprehensive model while keeping questionnaire length manageable; selecting and defining the role of model constructs in a behavioural context while keeping results comparable; and establishing a validated and reliable tool to diagnose a person's stage of change. Based on these insights, we develop recommendations for researchers designing studies based on the model, in order to support a well-founded and efficient advancement of the theory, which will then serve both researchers and practitioners who aim to promote pro-environmental behaviour.

To give an example of an application of the theory, we describe how we used the model to promote the transition from disposable coffee-to-go cups. Despite causing severe environmental issues like pollution and resource depletion, coffee-to-go cups are still a popular and convenient choice for many people that is often preferred to available environmentally friendly alternatives. We obtained 573 responses to a questionnaire containing items on the participants' current stage of change, behaviour, and influencing factors. All participants responded to items for three alternative behaviours: using a refundable cup system, using one's own cup, and reducing one's consumption of hot beverages outside of home.

Our data generally supported the stage model. Despite irregularities on some stages, model constructs largely predicted stage intentions. The same underlying psychological constructs could be identified to play a role in stage progress over all three behavioural alternatives, though the constructs varied with regard to their predictive power. Furthermore, as predicted by the SSBC, participants in different stages differed on key model variables such as intentions and reported behaviour – e.g. coffee-to-go cup consumption decreased in the last stage, in which the model predicts the adoption of an alternative behaviour.

Results indicated that the model's stages of behavioural change can describe coffee-to-go cup use, and provided insights into drivers of the behaviour change process that can inform interventions and promote pro-environmental behaviour. In a transdisciplinary team of researchers from various disciplines and practitioners, we developed a refundable cup system for the city of Darmstadt, Germany, as an alternative to disposable coffee-to-go cups. Based on the theory, we plan to implement a tailored information campaign to promote the uptake of this new system.

Key readings

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IV. Transdisciplinarity in Horizon 2020 and Horizon Europe

<u>Joël Graf</u>

Euresearch

Most calls of the European Framework Programme Horizon 2020 are focusing on collaborative R&I projects, often with the specific request to involve non-academic stakeholder knowledge. Furthermore, Horizon 2020 is strongly policy driven and explicitly aims at solving societal problems. Therefore, it is one of the most important funding instruments for transdisciplinarity. This is also the ambition of the upcoming Framework Programme Horizon Europe (2021-2027) which "should aim to become the biggest co-created and co-creation programme in the world" (Lamy Report 2017).

Against this background, the poster provides an introduction of what "transdisciplinarity" means in the context of Horizon 2020 and discusses the relevant funding mechanisms. In addition, it gives first insights into collaborative R&I programmes within Horizon Europe.

V. Results and lessons learned from the co-development and implementation of user-specific climate service products for companies

<u>Markus Groth</u>, Peer Seipold

Climate Service Center Germany (GERICS)

Companies are increasingly concerned with current and future climate change risks and opportunities that have the potential to generate a substantial change in their business operations, revenue and/or expenditure.

Against this background, the presentation first of all discusses the methodology and results from the joint activity „Business Strategies and Climate Change" carried out by the Climate Service Center Germany (GERICS), the management consultancy CSR as well as the German 2° Foundation and eight of its supporting companies. Based on the practical requirement to develop a novel approach to increase awareness for companies to adapt to climate change, a questionnaire has been co-developed as a novel „Company Analysis Tool".

Thereby the three complementary areas „Value Chain", „Value Levers" and „Value Drivers" are the main areas of investigation. The structure of the novel approach is orientated along the main organizational areas of companies: i) management and leadership, ii) market, iii) finances, iv) infrastructure, v) production and logistics and vi) employees. Each of the six main organizational areas is divided into different company-relevant subtopics, whereby each subtopics is translated into specific questions. In total, the „Company Analysis Tool" includes 55 questions regarding 36 subtopics. A first implementation and testing of the „Company Analysis Tool" has been carried out based on 35 semi-structured interviews with the top-level management involved. Thereby the main objective was to raise awareness for climate change and the need for adaptation action.

The presentation mainly discusses the methodology, practical implementation, results and lessons learned as part of this prototype development and testing of this user specific climate service product for companies. Main results of the project has been to learn about the crucial importance of closely integrating companies in the development of a climate service product at an early stage and on equal footing, to systematically integrate the adaptation to climate change into business strategies. Therefore our approach in general – but mainly the „Company Analysis Tool" with a clear focus on companies specific challenges in different sectors – proved to be a useful climate service product, with results of high relevance for adaptation practice and business.

However, based on the project, additional need for research has been derived regarding the necessary next step of integrating climate information into business operations. As part of this currently ongoing work, it will – jointly together with companies – analysed which weather events and climatic changes can directly or indirectly affect the companies' workflows and business processes. The identified impacts will then be prioritised with regard to their relevance for the company. The aim is to identify those affected areas that have the highest potential to influence companies. Climate parameters will then be selected for the most important impacts. For this purpose, available regional climate information for the identified climate parameters will be visualized and evaluated. As a basis for a subsequent identification of possible adaptation measures, the handling of the prepared climate information will be conveyed within the framework of a training course. Finally, a methodical procedure for the permanent consideration of climate information for the operational processes will be developed, implemented and evaluated.

Within the presentation also the methodological approach as well as first results and lessons learned from this co-development of a user specific climate service product for companies will briefly be discussed.

VI. Transdisciplinary processes, dialogue, common interests

Mª Helena Guimarães[1], Teresa Pinto Correia[2]

[1]Institute of Mediterranean Agricultural and Environmental Sciences (ICAAM) Évora University; [2]Institute of Mediterranean Agricultural and Environmental Sciences (ICAAM) Évora University

Keywords: Transdisciplinary processes, dialogue, common interests

Our aim is to present the procedure used to implement a long term transdisplinary dialogue, named Tertúlias do Montado: http://tertuliasdomontado.blogspot.com/. This case study is not a transdisciplinary research project but an ongoing dialogue between researchers and other societal members around a common problem of interest. There is no specific project, no stablished finished date and no specific outcome or result that is aimed at. The genesis of the initiative is the hypothesis that co-construction should be viewed as long term process that requires dialogue practises larger and broader than what financed research projects enable. It is still a transdisciplinary process since it follows the principals of this type of research. Therefore, the complexity of the issue is explored, the diverse perspectives are taken into account; abstract and case specific knowledge are linked; and different typology of knowledge are co- produced towards what is perceived to be the common good. All of these is done, with the coordination of a skilled facilitator, by representatives of different disciplines, of the private and the public sectors, and of the civil society. The Tertúlias do Montado started in 2016 and after 3 years of initiative we are ready to present the structure and to pose the question if this procedure could be replicated elsewhere or regarding other research topics.

VII. Perspective of non-scientific Actors in Local Collaborative Research Processes

Annaliesa Hilger

University of Wuppertal

Keywords: non-scientific actors, roles, rationales for participation, local level

Collaboration with non-scientific actors as one of the central claims of sustainability science (Kates at al. 2000) is reflected in a growing amount of transdisciplinary and transformative research processes. Interestingly, these collaborations vary enormously, concerning for instance the questions of who, how and why: the non-academic actors can be legitimized decision makers or so called 'practitioners', people affected or the public at large. The intensity of the collaboration ranges from solely consultation and participation up to co-creation processes. Also, the underlying individual rationales for this collaboration from the non-scientific, as well as, from the scientific actors vary enormously. Against this background there is not a "one fits all" form of organising, resulting in a boundary breaking collaboration. However, the variety of non-scientific actors with different potential activities and individual rationales is not always sufficiently considered when organising collaborative research processes, e. g. due to limitations of the funding scheme or the institutional framework.

Thus, the outlined contribution presents a methodological framework and the first results of an analysis from several heterogenous transdisciplinary and transformative research processes on the local level in Wuppertal, Germany. The analysis is guided by the question, who is collaborating how and with what underlying individual motivations. In doing so, this research aims to approach the question on formats of organising, e. g concerning institutions but also non-academic activities within these processes, from the perspective of non-academic actors.

The first results are based on guided interviews with collaborating actors, students field reports and structured group discussions of almost ten transdisciplinary research processes between student teachers and actors of urban gardens, which focuses on the production of socially-robust knowledge for the further work of these gardens. Additionally, these are complemented by interviews with collaborating actors, reflection workshops and research diaries of three real-world laboratories on the quarter level, established in spring/summer 2015, since when they have been running in parallel three-year long. Each real-world laboratory is characterised by the collaboration of a few practice partners and an early-stage researcher. Aside from the above outlined processes, the real-world laboratory also carries out real-world action as the so-called 'intervention'. Along with these two formats, the analysis will include further local collaborative research processes.

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PLENARY II

PLENARY II: THEORETICAL DEVELOPMENT

Wednesday, 11.09.2019, 15h50 – 17h30
[Wallenbergsalen]
Gerald Midgley[1], Merritt Polk[2]
[1]Centre for Systems Studies, Business School, University of Hull, UK; [2] School of Global Studies, University of Gothenburg, Sweden

Moderation: Henrietta Palmer, Artistic Professor, Architect SAR/MSA, Department of Architecture; Deputy Scientific Director, Mistra Urban Futures, Gothenburg, Sweden

Keynote I: An Introduction to Transdisciplinary System Thinking for Takling Wicked Problems
Gerald Midgley, Professor of Systems Thinking in the Centre for Systems Studies, Business School, University of Hull, UK

Systems thinking can support decision makers and their stakeholders in the public, private, voluntary and community sectors when they seek to address 'wicked problems'. Wicked problems are intransigent issues characterised by:
- Complex and uncertain interactions, with consequences that cannot easily be predicted;
- Multiple goals (e.g., economic, social and environmental) in tension;
- Multiple scales (e.g., local, regional, national and global);
- Multiple agencies, organisations, groups and communities involved or affected;
- Multiple perspectives on defining both the problem and potential solutions;
- Conflict, power relations and vested interests making change difficult; and/or
- Scepticism due to unintended consequences from previous attempted solutions.

At the present time, governments, businesses and NGOs are facing more wicked problems than ever before, which makes systems thinking increasingly relevant to our future. Indeed, the UN, WHO and OECD have all recently called for greater recognition that systems thinking is an essential leadership capability necessary for working across the Sustainable Development Goals (SDGs).
This presentation will describe four interrelated systems thinking skills:
1) Exploring boundaries – defining the inclusion or exclusion of stakeholders and the issues that concern them.
2) Appreciating multiple perspectives – how and why stakeholders frame issues in different ways.
3) Understanding relationships – networks of interconnections (including feedback loops) within and across systems.
4) Thinking in terms of systems – organised wholes with properties that cannot be anticipated by analysing any one part of the system in isolation.

Different methods help with the practical application of these systems thinking skills. The seminar will give examples of these methods, and will describe their application in a range of social and environmental policy projects from the UK and New Zealand.

Keynote II: Issues and Challenges for Theoretical Development in TD Research
Merritt Polk, Head of Department, Professor in Human Ecology, School of Global Studies, University of Gothenburg, Sweden

As outlined in the call, the focus of the 2019 TD conference is on what we can learn from our collaborative experiences, case studies and practices within the three overall thematic areas of wider societal transformation, methodological innovations and theoretical development. This plenary talk will explore the role of theory in TD research and discuss some of the challenges that arise in action-oriented collaborative research. The talk will start by discussing what theory refers to in TD processes. This includes theory as both explanatory statements regarding certain parts of societal transformation, and the ontological and epistemological issues that arise due to the characteristics of TD processes. The latter includes characteristics such as no presumed locus of control, the integration of knowledge from within different ontologies and epistemological traditions, and the hybrid space of TD

processes. The role of theory will be explored in these different areas. TD research is furthermore a practical approach that focuses specifically on co-producing and integrating knowledge and expertise to create actionable results for societal change. What is the role of theory in furthering such practice-based and action oriented goals?

SIDE EVENTS
[Foyer/Lobby]

URBAN FORUM PRACTICE MEETS ACADEMIA
Organiser(s): Lisa Diedrich[1], Per-Johan Dah[l2]
[1]SLU Urban Futures; [2]Urban Arena at Lund University

Opening of the Exhibiton: Wednesday, 11.09.2019, 17h30 – 18h30, [Foyer/Lobby]
Floor talks: Thursday, 12.09.2019, 15h50 – 17h30, [Foyer/Lobby]; Friday, 13.09.2019, 08h40 – 10h20, [Foyer/Lobby]

The **research platforms Urban Arena, at Lund University, and SLU Urban Futures, at the Swedish University of Agricultural Sciences**, qualify as academic agents with concern for professional practice and the built environment in an epoch of global urbanisation – as such they are currently developing a new format of critical encounter for practitioners and academics in the field. It is held for the second time during the ITD Conference in Göteborg and invites **reflective practitioners, practice-oriented researchers, and design critics** to present and discuss collaborative experiences, case studies and practices from a variety of backgrounds, in view of developing sustainable cities and communities. This is to support the conference's goal to create moments and spaces where diverse groups can exchange experiences and learn from each other in view of increasing the body of practitioners and researchers working in collaboration.

In line with European research programmes like JPI Urban Europe the organisers of the Urban Forum see SDG 11 on sustainable cities and communities as a portal to all other SDGs, and the **urban realm** as a place where cluster problems are more manifest than elsewhere and where **sustainability efforts can multiply** exponentially and almost overnight. Convinced that particularly valuable action-oriented knowledge arises from the exchange of practice and academia, they arrange a particular format of encounter: the **Urban Forum | Practice meets Academia**. Practitioners of architecture, urbanism, landscape architecture, urban studies and the construction industry are invited to display their building projects (realised or not) and research endeavours (practice-based or-oriented) in an exhibition. The inauguration of the Urban Forum (on 11 September evening) and two sessions (on 12 and 13 September 2019, respectively) allow authors and audience to discuss burning questions, critical aspects, inspiring findings they wish to bring to light and get feedback on, in a collegial atmosphere. Project authors present their work during 10 minutes, followed by a moderated discussion of 15 minutes. Related literature is on display during the Urban Forum, in particular the thematic dossier 'Tools and Techniques for Uncertain Times', published *in 'scape the international magazine for landscape architecture and urbanism* (#16/2019), realised within SLU Urban Futures' theme area of Critical Knowledge Practices.

The Urban Forum | Practice meets Academia points at the physical design disciplines' long history of generating new ideas and proposes to acknowledge design as a knowledge producing activity. The design disciplines share with the sciences and the humanities a mission to contribute to the betterment of society. The Urban Forum | Practice meets Academia forms part of an ongoing project to **extract knowledge from practice**. It collects practitioners and researchers who share a commitment to 'crossing the line' – **from problem solving to knowledge-sharing**, who see value in collaborating across the academy and the professions, and who strive to seek out good ideas and learning from the experiences of others, no matter where or how that useful know-how is produced.

Planners and designers, related authorities, other actors and researchers, all need to recognize that as matters become increasingly complicated, the tools we need today differ from those we have used in the past. Disciplines and professions conventionally deliver the keys of understanding and the modes of operation with which to handle problems in disciplined and professional ways. At the same time, disciplined or professional mindsets can get in the way of seeing situations in another light, from grasping opportunities for further learning from problems that cannot be simply scrutinised and from there 'solved'. Problems resisting standard treatment offer more than frustration. They invite practitioners and researchers to explore beyond professional business as usual and traditional discipline-based knowledge creation. This is the moment to *un*-**discipline** and *de*-**professionalise** – to cross the 'line' between academy and profession, between one discipline and another, and between one profession and another. The organisers of the Urban Forum | Practice meets Academia are convinced that we need more engagement between

practice and research, more testbeds for **exploring processes aimed at sustainable urban development and urban transformation**.

Urban Forum | Practice meets Academia is a collaborative initiative by Prof. Lisa Diedrich, SLU Urban Futures (www.slu.se/urbanfutures), and Assoc. Prof. Per-Johan Dahl, Urban Arena at Lund University (www.urban.lu.se) with the purpose of increasing the interaction between practice and academia.

It is supported by Tankesmedjan Movium/ Think Tank Movium, Swedish University of Agricultural Sciences (www.mvium.slu.se)

The thematic dossier 'Tools and Techniques for Uncertain Times' has been elaborated by Andrea Kahn and Lisa Diedrich for the Urban Forum's media partner *'scape the international magazine for landscape architecture and urbanism (www.scapemagazine.com)*

THE ALLIANCE FOR INTER- AND TRANS-DISCIPLINARITY (ITD-ALLIANCE) IS FOUNDED AT THE INTERNATIONAL TRANSDISCIPLINARITY CONFERENCE 2019 IN GOTHENBURG - MEET FOUNDING MEMBERS FOR INFORMATION AND EXCHANGE!

Organiser(s): Alliance for Inter- and Trans-disciplinarity ITD-Alliance

Wednesday, 11.09.2019, 17h30 – 18h30, [Foyer/Lobby]

About ITD-Alliance

Since several years, the level of global attention to and engagement in transdisciplinary research is rising. For over a decade, the bi-annual International Transdisciplinary Conference has been promoted and co-organized by td-net, the Network for Transdisciplinary Research, sponsored by the Swiss Academies of Arts and Sciences. To build on the global recognition of this dynamically growing community, leaders from allied networks, associations, and institutions propose to create the l Alliance for Inter- and Trans-disciplinarity (ITD-Alliance).

Founding partners agree to initiate a process for engaging networks, associations, institutions, and individuals who share the mission of strengthening the global capacity and calibre of inter- and transdisciplinary research, education, and training.

The need to address complex problems and intellectual questions through inter- and trans- disciplinary research and education, including societal challenges such as sustainability, health, and equality, serves as a common link among potential partners. The key motivation to creating ITD- Alliance is to support those who move beyond highly specialized reductionist disciplinary efforts across fields. An interconnected network can draw on and complement existing resources while explicitly refining, developing, and evaluating inter- and transdisciplinary epistemologies, theories, methods, interventions.

ITD Alliance will promote inter- and transdisciplinary research, education, and training by supporting regular networking opportunities and ongoing exchanges across disciplines, institutions, and sectors. Creation of ITD Alliance provides a vehicle to increase visibility and coalesce work currently dispersed across continents. In this way, ITD Alliance can serve to catalyse greater collaboration focused on societal problem solving and understanding of complex issues. Its existence also contributes toward achieving the United Nations' Sustainable Development Goals.

Goal of ITD Alliance

The goal of ITD Alliance is to link networks, associations, institutions, and individuals with shared interest in inter- and transdisciplinary theory, methods, and interventions for addressing complex problems and questions, including real-world societal challenges. This goal will be addressed through collaboration between members in working groups, international conferences, exchange of information, joint training, education, and publications.

THE AIR NETWORK EXHIBITION: A TRANSDISCIPLINARY APPROACH TO ADDRESSING AIR POLLUTION IN INFORMAL SETTLEMENTS

Contributor(s): <u>Cressida Bowyer</u>[1,2], **William Apondo**[2], **Patrick Bueker**[2], **Cindy Gray**[2], **Matthew Hahn**[2], **Fiona Lambe**[2], **Miranda Loh**[2], **Alexander Medcalf**[2], **Cassilde Muhoza**[2], **Kanyiva Muindi**[2], **Timothy Njoora**[2], **Heather Price**[2], **Charlotte Waelde**[2], **Megan Wainwright**[2], **Anna Walnycki**[2], **Jana Wendler**[2], **Sarah West**[2], **Mike Wilson**[2], **Residents Mukuru Informal Settlement**[2]

[1]University of Portsmouth, UK; [2]Air Network

Opening of the Exhibiton: Wednesday, 11.09.2019, 17h30 – 18h30, [Foyer/Lobby]

Air pollution is a global health concern. As well as reducing life expectancy, it lowers quality of life through respiratory and cardiovascular diseases often leading to a reduction in people's resilience and productivity. In Kenya, levels of air pollution are particularly high in informal settlements, both outdoors and indoors. Settlements are often located near to industrial areas, busy roads, and sites of litter burning. Indoor air pollution is the result of cooking, lighting and heating with low-quality fuels in badly ventilated huts. Attempts to improve air pollution and reduce exposure have been introduced in Nairobi's informal settlements in recent years. However, significant positive effects on people's health have not yet been reported.

The AIR (Action for Interdisciplinary Air Pollution Research) Network www.airnetworkafrica.com has explored new approaches to tackle air quality. The network comprises African and EU partners from a wide range of disciplines, and community participants who are residents of Mukuru, Nairobi. The long-term goal is the co-creation of innovative, participatory solutions to air pollution and its effects on human health in low-resource settings in Sub-Saharan Africa.

The AIR Network developed a mixture of creative methods to discuss, explore and engage with the issue of air pollution, including theatre, visual arts, games, story-telling and music. This exhibition charts the network's development and successes, and showcases outputs which were generated through the network's activities. Comprising 15 panels, participatory mapping artefacts, digital stories, and music composed and recorded especially for the network, the exhibition introduces the rationale behind the project, the problems to be addressed and how interdisciplinary working was discussed, planned and actioned. The panels feature reproductions of comics, posters, community art and photographs created by the network. The photographs document the pollution challenges faced by the residents of Mukuru and are backed by striking testimonies from people who live and work in the community, gathered as part of project interviews. Other panels document the use of legislative theatre (a form of improvisation theatre, where an audience of policy-makers are invited into the play to help to "solve" a problem, and the actors in the play demonstrate the difficulty in finding an easy answer) and participatory mapping (used to identify pollution hotspots). Four digital stories were filmed and directed by community members to document local experiences of air pollution, and AIR Network activities. Music was identified as an effective communication tool, and songs and videos were composed and recorded in order to raise awareness locally and globally. Some of the digital outputs have been formatted in 360 and can be viewed using 3D headsets.

The AIR Network digital outputs can also be viewed here:

www.youtube.com/playlist?list=PLoJ3pxCzMP1v9JSX_KG9IUUHsOOOFBDnh www.youtube.com/watch?v=AtH0-NreUxA

Wednesday, 11.09.2019, 18h30 – 21h00

CONFERENCE DINNER

[Restaurant Norden, Wallenberg Conference Centre]

pre-booking only

PARALLEL SESSIONS III

PLATFORMS FOR TRANSDISCIPLINARY CO-PRODUCTION – STAKEHOLDER PERSPECTIVE ON CHALLENGES AND OPPORTUNITIES

Thursday, 12.09.2019, 08h40 – 10h20
[Wallenbergsalen]
Organiser(s): <u>Elma Durakovic</u> (Platform leader), <u>Sanna Isemo</u> (Project coordinator)
Mistra Urban Futures, Gothenburg Platform, Sweden
Keywords: Mistra Urban Futures, Institutionalisation, Co-production, Stakeholder perspectives

Dealing with complex urban challenges are in need of cross-sectorial collaborations between different actors in our society and requires more experimental and innovative forms of institutional collaborations (May & Perry, 2016). Mistra Urban Futures has developed institutional platforms for transdisciplinary co-production that aim to tackle the complexity of urbanisation, named Local Interaction Platforms (LIPs). Based on co-governance and co-funding, giving a sense of joint leadership and ownership but also creating a third space for transdisciplinary research and mutual learning. (Perry, B et al, 2018) A space where context based, - and solution-oriented research can evolve and be formulated collaboratively. At the Gothenburg Interaction Platform (GOLIP) this has developed into a multisectoral collaboration where different stakeholders play an important role in identifying, developing and conducting transdisciplinary research. Co-production has evolved into joint leadership between researchers and practitioners. Stakeholders involved in the Gothenburg interaction platform are often complex institutions/organisations that are organised differently ways making the collaborative work somewhat challenging. Different stakeholders have different incentives for their involvement in GOLIP. From a stakeholder perspective, what challenges are there and how does one work with the complexity as an integrated part of the Local Interaction Platform? How can these challenges be converted into opportunities?

Workshop set-up
1) Introduction to Gothenburg Local Interaction
   Presenter: Elma Durakovic, Gothenburg Local Interaction Platform
2) Stakeholder perspective from the public sector
   Presenter: tbc
3) Stakeholder perspective from academia
   Presenter: tbc
4) Panel discussion: *How can these challenges be converted into opportunities? Can we overcome all challenges? What does it mean to involve other actors such as the civil society and private sector?*
   Participants: Gothenburg City (tbc), Elma Durakovic (Platform director) Mikael Cullberg (Chair of the Consortium), Gothenburg University (tbc)
5) Discussion session

References

Perry, B, Patel, Z , Norén Bretzer, Y, Polk, M, Organising for Co-Production: Local Interaction Platforms for Urban Sustainability, Politics and Governance (ISSN: 2183–2463) 2018, Volume 6, Issue 1, Pages 189–198 DOI: 10.17645/pag.v6i1.1228

May, T., & Perry, B. (2016b). Knowledge for just urban sustainability. Local Environment, 22(Supplement 1), 23–35. doi: 10.1080/13549839.2016.1233527

CROSSING THE LINE - REIMAGINING SYNTHESIS WORK

Thursday, 12.09.2019, 08h40 – 10h20
[Europa]

Organiser(s): Jonas Bylund[1], Caroline Dahl[2], Lisa Diedrich[3], Andrea Kahn[4], Katarina Schylberg[5]

[1]JPI Urban Europe, Europe; Sweden; [2]IQ Samhällsbyggnad/JPI Urban Europe, Sweden; [3]SLU Urban Futures, Sweden/ Landscape Architecture Europe, Europe; [4]SLU Landscape, Sweden/ designCONTENT, USA

Keywords: Synthesis, formats, knowledge practices

This session explores how "synthesis" – re-imagined beyond the conventional academic literature review – may be mobilized as a potential and powerful transdisciplinary format.

It starts from the claim that transdisciplinarity, while popular in principle, is not yet viable in practice, as it lacks proven formats and methods for doing the work, and for communicating the outcomes of the work. We propose that "synthesis (reimagined)" has potential to become a viable transdisciplinary format. Furthermore, the session provides a warrant for why synthesis needs to be reimagined to become such a format, since (a) It needs to accommodate heterogeneous knowledge practices; and (b) Its results need to be accessible/available to different discursive/practice communities.

Transdisciplinarity involves heterogeneous knowledge practices *'practicing together'*. This approach to knowledge production is increasingly viewed as key to addressing the societal challenge of urban sustainable transformations and increased liveability. At the same time, it is becoming increasingly evident that we lack the transdisciplinary formats and methods required to navigate, collate, distil and communicate (synthesize) knowledge outcomes generated through diverse knowledge practices.

A current challenge for transdisciplinary approaches is how to formalise knowledge. This raises the issue of suitable formats. Technical text can work well in certain contexts, such as expertise-based and /or academic knowledge practices; but it works far less well for sharing and learning in the heterogeneous knowledge practice context of transdisciplinary work. By drawing a line between 'knowledge and non-knowledge' conventional synthesis (typically, literature-review based) gets in the way of constructively aggregating knowledge outcomes from heterogenous sources. But, what if the line between 'knowledge' and 'non-knowledge' gets crossed out, substituted by open ended settings of knowledges/heterogeneous knowledging? How then can synthesis formats and approaches be re-thought, re-designed, and re-newed to suit diverse ways of knowledging beyond the seclusion of academic institutions?

For example, while it is relatively straightforward to commission a 'synthesis' on a research field or academic debate related to sustainable urban transition work, doing so for a collection of actively ongoing urban sustainable transition projects such as Urban Living Labs proves much more difficult. How to learn from this work? Many times, we find that, on the one hand, the knowledges/know how pertinent to sustainable urban transitions is not readily found in papers and reports. And, on the other hand, any synthesis 'product' made from collecting findings from those projects may be less useful or relevant if rendered in a conventional paper or text-based report. Other formats or media may be required.

Hence:

- Conventional research practices and methods constrain the impact potentials of synthesis, *so*;
- We need "work arounds" to mobilize diverse co-present knowledge products and practices, *but*;
- Productive transdisciplinary collaborations and conversations face many hurdles (normative metrics don't apply, non-commensurate value systems/habits of mind, unstated assumptions, etc.

Session design

This session – a collaboration between panelists and participants – aims to elaborate on why synthesis is needed, explore some examples of how it can be done, and reflect on what the synthesis outcomes could be. It will be structured in three- parts:

1. *Why" reimagine synthesis?* - Panelist presentations - 15 minutes.

What do we mean by **strategic** synthesis? How is it different from normative synthesis?

What's in the toolbox now? What could be a new tools?

      Who are the audiences for strategic synthesis?

      Why do we need it? Introducing the test case: Urban Living Labs

2. *"How to" interactive synthesis* - Participatory demonstration   45 minutes

Case study: "The Valencia workshop: from JPI Urban Europe Placemaking Week, June 2019"

Rehearsing strategic synthesis: 3 parallel working groups, 30 minutes

Presenting synthesis outcomes - 15 minutes presentation (5 x 3 groups)

3. "What next - reflectivity on the go" - Observations/provocations for future work, - 25 minutes

Comparing the parallel synthesis efforts, what can we take away?

What could the craft entail? How did the toolbox expand?

How can we communicate session outcomes? What should be follow up work?

Background Materials (will be circulated for use in workshop)

Valencia Urban Living Labs for Placemaking and Urban Transitions workshop description

Valencia Urban Living Labs for Placemaking and Urban Transitions workshop outcomes

Recommended readings (optional)

JPI Urban Europe, Strategic Research and Innovation Agenda, SRIA 2.0. *https://jpi-urbaneurope.eu/app/uploads/2019/02/SRIA2.0.pdf*

Integrative thinking, synthesis, and creativity in interdisciplinary studies, David J. Sill, *The Journal of General Education, Vol. 50, No. 4, Best of JGE: Featuring Articles from 1984–2000* (2001).

LAE Foundation (ed) (2018), *Landscape Architecture Europe #5 Care Create Act* (Wageningen: Blauwdruk)

II. Presentation:

Environment Courts in Chile: First steps understanding transdicipline as a tool

<u>**Sibel Villalobos**</u>

Tercer tribunal Ambiental (Third Environment Court)

Keywords: Environment, law, science, transdiscipline

Since year 2000, a steady growth in the number of environmental courts and tribunals (ECTs) in the world has occurred. On 2016, the UNEP reported over 1200 of this specialized courts in 44 countries. The main difference between ECTs and traditional courts, is that the decision-making process often incorporates both lawyers and scientific experts.

Chile is one among this 44 countries with ECT's. This country's jurisdictional model for solving environmental disputes is territorially based, and has a mixed composition. This last means that one of the three judges of the court must be an expert in sciences. According to the history of the law N° 20.600 that creates the environmental courts in Chile, the mixed composition should be the way for true integration of different disciplines for a reasonable and complete dispute resolution process. But after almost four years of functioning, a natural question arises: Is multidiscipline enough to achieve that?

If we consider that the upper level of complexity on integrating knowledge is transdiscipline, and that a clear and simple definition of this concept is: "a reflexive, integrative, method-driven principle, aiming at the solution of complex problems" (adapted from Lang et al., 2012), a coherent relation with environmental courts and tribunal's job rises immediately: the resolution of complex socio-environmental disputes, applying different sources of knowledge, and combining reasoned technic-scientific, socio-economic and legal arguments.

By reviewing some key aspects considered relevant on transdisciplinary research and a more philosophical approach to transdisciplinary, this research tries to bind different concepts related to transdiscipline with the decision making process of Chilean Environment Courts, with emphasis in the requisites, the phases as well as the challenges acknowledged for transdisciplinary research, reviewing if all this elements can be directly related or detected in the process of environmental adjudication.

Based on this review, it is possible to state that the environmental adjudication process is, without a doubt an incredibly fertile terrain to implement and analyze a transdisciplinary framework as a methodological approach for a better decision-making process, since this process can fill the requirements of all transdisciplinary research, which are (according to Lang et al., 2012) the focus on socially relevant problems, the promotion of mutual learning among disciplines and creates new knowledge that can be transferred to practice. The same occur when reviewing the phases of transdisciplinary research: problem framing, co-creation of a solution and application of created knowledge or solution.

Finally, a more philosophical approach to transdiscipline, provided by Max-Neef (2005), in which he proposes a "First Law of Transdisciplinarity" that tells us that the laws of a given level of reality (discipline, knowledge or point of view) are not self-sufficient to describe the totality of phenomena occurring at the same level, can rephrased for

environmental adjudication in terms of having a methodological frame to avoid solving any conflict (any phenomena) with a single level of reality (a single discipline).

The same occurs for the second law of transdisciplinarity which recognizes that a theory shall be transitory until reviewed in different levels of reality, which in a judicial decision, shall consider, for example, reviewing the consistency of an act from all the different disciplines engaged on it, and not only from the legal perspective.

Key Readings

Lang D, Wiek A, Bergmann M, Stauffacher M, Martens P, Moll P, Swilling M, Thomas C. (2012) Transdisciplinary research in sustainability science: practice, principles and challenges. Sustain Sci 7 (Supplement 1):25-43.

Max-Neef M. (2005) Foundations of transdisciplinarity. Ecological Economics 53:5-16.

Pring G. & Pring C. (2016) Environmental Courts and Tribunals: A guide for Policy Makers. UN Environment (UNEP). Nairobi, Kenia.

III. Presentation (short):

Yarra Valley Water: Australian water utility or a transdisciplinary research organization?

Francis Pamminger[1], Cynthia Alison Mitchell[2]

[1]Yarra Valley Water; [2]University of Technology Sydney

Keywords: industry as a site for change, outcome spaces, industry-university partnerships

Yarra Valley Water (YVW) is a publicly-owned, publicly-regulated utility providing water and sanitation services to 1.9 million people and more than 50,000 businesses across 4,000 square kilometres in Melbourne, Australia. Over the last two decades, YVW has been on a remarkable path of continual learning and transformation, moving from a compliance orientation to leading by example in ecological, social, and economic decisions and outcomes. This commitment positions YVW as a significant 'site for change' and a catalyst of 'wider societal transformation' in multiple realms that include and extend beyond the urban water sector.

Conventionally, we situate transdisciplinary research within universities, but in this paper, we wonder whether YVW might itself be a transdisciplinary research organisation, through its ongoing searching for, enabling and enacting transformation for its people, for itself as an organisation, and for the urban water sector more broadly. To explore this claim, we will review YVW's commitments through the lens of the transdisciplinary outcome spaces framework (Mitchell et al., 2015). Briefly, the framework describes three domains we would expect to be evident where transdisciplinary research is underway: improving the situation, contributing to stocks and flows of knowledge, and enabling mutual/transformative learning for those doing/participating in the research.

Improving the situation: YVW's first step beyond a compliance orientation occurred in the early 2000's, with a commitment to 'provide all services within the carrying capacity of nature'. By 2016, YVW recognised that while sustainability seemed like the ultimate end point, it was not enough because the environment was still degrading. Their next commitment was therefore to a restorative approach i.e., doing more good, rather than less bad, for example through doubling its social capital by 2020, and achieving energy neutrality (i.e. renewable generation to meet all its energy demands) by 2025.

Stocks and flows of knowledge: YVW have been at the forefront of implementing and generating inter- and transdisciplinary research insights. Their early application of life cycle analysis provided a breakthrough in demonstrating the value of innovative servicing strategies, against knowledge experts of the day. Their experimentation with on-site systems and urine-diversion led to new insights in community engagement and organisational systems (Fam et al., 2013). They have been the subject of successive case studies in the business literature, most recently through their leading application of Integrated Profit and Loss accounting (www.yvw.com.au/about-us/reports/integrated-profit-loss-report) – the first water business internationally to attempt this. Their current focus linking determinants of health to the demographics of their customer base has led to more genuinely new insights, such as the connections between family violence and access to utility services. YVW then initiated the Thriving Communities Partnership (https://thriving.org.au), a cross-sector collaboration aiming to deliver fair access to modern essential services for all in contemporary Australia.

Mutual and Transformational Learning: All of this has only been possible because YVW staff have been encouraged to question and to learn, and to question again and to learn some more. YVW has invested over many years in personal development for its people, and organisational development for its culture that has totally changed how the business acts. It is recognised nationally as a leader for this work. Significantly, Yarra Valley Water also shares this work with others, recognising that YVW, the whole sector, and the society the serve will be better off if change occurs more widely than just within its own organisation.

To support their journey, YVW have sought out and invested in longstanding collaborations with diverse research organisations, such as UTS' Institute for Sustainable Futures and Germany's Fraunhofer Institute.

References

Fam et al., 2013 *Water Policy*, *15*:1094-1108

Mitchell et al., 2015 *Futures,* 65:86-96

IV. Presentation:

Transdisciplinary agenda setting for research and innovation

Niklas Gudowsky, <u>Mahshid Sotoudeh</u>

Institute of Technology Assessment, Austrian Academy of Sciences

Keywords: agenda setting, transdisciplinary foresight, case studies

Current governance of science, technology and innovation (STI) is heavily challenged to meet demands arising from complex issues such as the societal challenges (Georghiou and Cassingena Harper 2011, Boden, Johnston et al. 2012, EuropeanCommission 2016) or the Sustainable Development Goals. Thus a stronger orientation of research and innovation towards societal needs, demands and preferences has recently become a main argument under the header of RRI (responsible research and innovation) in the European Union and beyond.

Agenda setting is a concrete way of shaping futures by guiding the allocation of significant funds towards the chosen targets or prioritized fields. Orienting research and innovation is a complex task in itself and respective agenda setting processes have traditionally been expert-driven as scientific knowledge has long been considered the only appropriate form of knowledge for e.g. framing research agendas. Of course, the integration of organised stakeholders' interests also has a long tradition (e.g. in form of lobbyism) as agenda setting in most cases is partly, or mainly a political process.

Expert-based anticipation of future developments, identification of possible challenges and solutions to frame respective strategic decisions has been embedded into research programming (Könnöla and Haegeman 2012, Haegeman, Spiesberger et al. 2017), however it presents a limited approach to shaping futures as this may neglect societal needs and values and therefore valid alternative futures. Hence, advice giving processes opened up to public participation, which became a norm for instance in foresight and technology assessment over the last decades (Joss and Bellucci 2002, Nikolova 2013).

Besides the democracy argument for participation in terms of tackling lacking transparency and growing mistrust in decision making and the functional argument that widened participation contributes to better understand societal impacts of science and contributes to better decisions (Boussaguet 2015), there is also the normative argument that a wider public should be included into guiding decisions of distributing tax-money for research and innovation that possibly concerns public and individual lives.

Thus, research agendas are increasingly becoming the target of multi-actor engagement processes aiming at integrating a broader base of information by considering other forms of knowledge (OECD 2017). Research programme development offers a gate for an early entry point of public needs and values into the innovation process (Gudowsky and Peissl 2016). Several experiences with participatory agenda setting processes suggest that 'laypeople's experiential and value-based knowledge is highly relevant for complementing expertise to inform socially robust decision-making in science and technology' (Gudowsky and Sotoudeh 2017). Recent empirical evidence from comparing citizen-driven STI agenda setting with expert-based foresight studies strengthens this claim (Rosa, Gudowsky et al. 2018). Aiming at producing sustainable strategies for responsible socio-technical change, research funding can benefit from combining forward looking and public participation to elicit socially robust knowledge from consulting with multi-actors, including citizens.

However, including laypeople into futures studies and foresight in general as well as into forward looking science, technology and innovation governance in particular is underexplored. This contribution will review theory and recent case studies of transdisciplinary agenda setting activities to map international progress in this emerging field of research and practice.

PATHWAYS TO IMPACT OF TRANSDISCIPLINARY RESEARCH: THE ROLE OF CONTEXTS, GOALS, AND EPISTEMOLOGICAL ASSUMPTIONS

Thursday, 12.09.2019, 08h40 – 10h20
[Atarktis]

Organiser(s): Flurina Schneider[1], Claudia Binder[3], Tobias Buser[1,5], Livia Fritz[3], Sabine Hoffmann[2], Zarina Patel[6], Christian Pohl[4], Isabelle Providoli[1], Thorsten Schilling[3], Theresa Tribaldos[1]

[1]Centre for Development and Environment CDE, University of Bern, Switzerland; [2]EAWAG; [3]EPFL; [4]TD-Lab, ETHZ; [5]Td-net, Swiss Academies of Arts and Sciences; 6: University of Cape Town, South Africa

Keywords: pathways to impact, theories of change, empirical experiences

Transdisciplinary research is considered as a promising research approach when aiming to producing knowledge that can contribute to sustainable development. But so far, empirical evidence showing to what extent it is actually advancing sustainable development is scarce and relies on individual case studies: some studies show potentials, other challenges and limitations. Acknowledging that sustainability transformations can unfold in many different ways with different involvement of knowledge, knowing and learning, this mixed result is not surprising, and points to the need for differentiation. The question arises in which situations and for which impact goals what kind of transdisciplinary research and related pathways to impact holds promise. Answers to this question will enable researchers to tailor transdisciplinary approaches to specific situations and to reflect on and enhance its contributions for sustainable development.

In recent years, scholars started to conduct meta-level studies of multiple cases in order to differentiate distinct pathways to impact and to search for patterns between transdisciplinary approaches, envisioned or achieved goals, and context conditions. Results give indications for promising transdisciplinary impact goals and designs. However, increasing research also points out that links between transdisciplinary research and sustainability transformations are by no means linear and often beyond the area of influence of the researchers involved. Moreover, epistemological assumptions and expectations underpinning the different transdisciplinary research designs and activities, as well as the conceptualised pathways to impact can vary greatly, making it challenging to compare the different approaches.

Against this background, the goal of this session is to discuss insights from meta-level studies that focus on different pathways to impacts of transdisciplinary research, taking into account distinct impact goals, context conditions and epistemological assumptions. By doing so, we aim to unravel the potential and limitations of transdisciplinary approaches for effectively contributing to sustainability transformations.

The session starts with 5 talks (about 10min each), followed by a structured discussion with all session participants on the guiding questions below.

Impulse talks:

Expected and experienced effects of participation – a systemic analysis of perceptions of researchers and practitioners in sustainability research. Claudia R. Binder, Livia Fritz and Thorsten Schilling will present the results of an interview study on expected and observed effects of participation in seven transdisciplinary research projects aiming to contribute to sustainability development. The focus will be put on the diversity of perceived pathways from participation to societal effects.

Promises and potentialities of transdisciplinary practices in African cities: Learning from LIRA 2030: Zarina Patel and Flurina Schneider will give insights on a study of the LIRA 2030 programme that fosters transdisciplinary research in African cities with the aim of co-producing knowledge leading to effective and sustainable urban transitions. The study illustrates the variety of approaches and assumptions employed by individual projects – shaped by local contexts. Close examination of the projects illustrates that the lack of uniformity in approach and assumptions resonates with experiences in the global North, raising questions about the potential for a uniquely African approach to transdisciplinary research.

From transdisciplinary knowledge production to societal transformations: Pathways explored by projects on urban development. Tobias Buser et al. will explore, how stakeholders link back from transdisciplinary projects to their organisations. Based on interviews and workshops with practitioners participating in TD-projects in Sweden and Switzerland, we found a wide range of approaches, ranging from the use of the organisation's communication channels to changing whole planning processes based on experiences with TD-processes and methods. We see a

large potential in actively reflecting within TD-projects on promising pathways to achieve the potential for organisational learning and change in participant's organisations.

Change Theory Thinking for Investigating Pathways to Impact of Transdisciplinary Sustainability Research. Flurina Schneider et al. will present insights of a study investigating pathways to impact and underlying theories of change of 20 transdisciplinary research projects aiming to contribute to sustainability transformations in the global North and South. The study revealed 11 distinct components of theories of change that are used and combined by projects in different ways.

Guiding questions for the discussion:

The discussion will be structured with the following guiding questions:

- What pathways to impact are intended and pursued by different transdisciplinary projects?
- Do different sustainability impact goals or contexts affect the choice of the transdisciplinary designs and pathways to impact?
- What epistemological assumptions and theories of change underpin the chosen transdisciplinary designs?

EXPLORING METHODS I (COMPOSED SESSION)

Thursday, 12.09.2019, 08h40 – 10h20

[Sydamerika]

I. Presentation:

Ale municipality in 360 degrees - A participatory transdisciplinary Agenda 2030 process

John Holmberg[1], Johan Larsson[1], Birgitta Augustsson Nilsson[2], Julia Widbom[2]

[1]Chalmers University of Technology; [2]Ale Municipality

Keywords: agenda 2030, participatory, backcasting

Ale municipality in Western Sweden, together with many other municipalities, notes that the challenges they face linked to the Agenda 2030, are complex and often cross organizational boundaries. Ale municipality has therefore, in agreement at the highest level, been determined to formulate, test and solve problems together with residents and organizations in the municipality. Ale municipality has turned to researchers and experts to develop and follow a TD process, which has the name Ale in 360 degrees.

The first step has been to listen, from the different parts of society, which issues are particularly important for residents, people who work in Ale, politicians and officials in the municipal organization. 204 people participated in conversations and interviews. The conversation has been carried out individually or in groups, face to face. A group of interviewers were trained internally in the spring of 2018 in being able to lead and conduct neutral conversations. Interview persons were found by advertising in various media and through open inquiries in all locations of Ale. In order to find additional people, all the interviewees were asked to point to new people. All interviewees were anonymous. To capture the most important aspects for a desirable and sustainable future Ale, four overarching questions were used. The questions bring together the social, economic, ecological dimension of sustainability along with the question of human needs and well-being. During the fall of 2018 the material was put together and categorized in a perspective report.

In early spring of 2019, all residents, politicians and interviewees were invited to open meeting to reflect upon which questions that are particularly important and urgent, with the collected material from the perspective report as the basis. The prioritization scheme is now managed by Ales politician who will decide on which areas to continue work with in the form of backcasting labs.

The research (1) participates in dialogue with Ale municipality to develop and understand this new way of working, what works and does not work, and why, and (2) does comparative studies with other cases nationally and internationally, which also seek to address complex sustainability challenges in new ways, and (3) reflect on how transdisciplinary collaboration works in this type of processes and what kind of learning that takes place.

This presentation will provide an overview of the process and learning so far from a practitioner's perspective as well as from scientific perspective. It will also invite to a discussion about future possibilities.

II. Presentation:

The 'Research Forum' as a methodological tool for transdisciplinary co-production

Mirek Dymitrow[1,2], Karin Ingelhag[3], <u>Shelley Kotze</u>[1,3]

[1]Chalmers University of Technology - Mistra Urban Futures, Sweden; [2]University of Gothenburg - Department of Economy and Society, Sweden; [3]Business Region Göteborg, Sweden

Transdisciplinarity connotes a strategy that crosses many disciplinary boundaries to create a holistic approach; due to this insistence, it has gained widespread popularity in recent years. However, in transdisciplinary collaborations based on academic–practitioner interactions, this is not always as straightforward. In this text, we would like to share some insights from our past and ongoing work with the project 'Urban Rural Gothenburg', within which we have launched the Research Forum (RF) model as a means of co-producing new transdisciplinary knowledge.

RF 'Urban Rural Gothenburg' constitutes Mistra Urban Futures' contribution to the project 'Urban Rural Gothenburg', a three-year (2017-19) EU-sponsored project for sustainable development with the overarching aim to create improved conditions for green innovation and green business development between the city and the countryside. The RF constitute the project's academic component within a transdisciplinary (penta-helix) model. The RF is meant to serve as an incubator and accelerator of various initiatives concerned with understanding, testing and implementing ecologically oriented solutions that may arise through academic–practitioner interactions. The RF is thus not a 'place' (in the concrete sense) but a collaborative effort of two coordinators – one practitioner and one academic, aided by an assistant, who actively pursue and facilitate new ways of extracting knowledge within a large and heterogenous project structure.

Identifying and successfully matching different perspectives, points of view and pools of knowledge is a difficult challenge. This is mainly because interactions are seldom based on the same principles; different people have different foci, incentives, and agendas, while understanding how they work out in practice is key to successful implementation of the RF model. In this presentation, we focus on the description, analysis and evaluation of the RF as a methodological endeavor. The findings center on four of the most common modes of interaction encountered during our work with the RF: academics to practitioners (A > P); practitioners to academics (A < P); academics with practitioners (A >< P); and academics without practitioners (A | P). We conclude that if we truly want to embrace co-production as way to obtain new knowledge we inherently must concede part of our individuality towards a homogenous goal. At the same time, the specificity of different forms of knowledge cannot me melted into an amorphous mass, elsewise co-production is likely to become a tokenistic effort of little applicatory utility. Put simply, we must constantly remain open to change but also stay protective of knowledge that works without reinvigoration.

III. Presentation (short):

Sustainability transition scenario planning. A transdisciplinary case study from Blekinge in Southeast Sweden

<u>Henrik Ny</u>, Varvara Nikulina, Giles Thomson, Sven Borén

Blekinge tekniska högskola (BTH)

Climate change challenges and the latest IPCC report (2018) urge for a rapid change towards sustainability across all sectors. While Sweden is a global sustainability leader, the 2019 Swedish Climate Policy Council highlights that sustainability action is too slow to meet current goals particularly with regards to transport and the urban environment. Regional planning plays a crucial role in the process of change as the planners need to address international agreements, such as the Paris Agreement, Agenda 2030 and the New Urban Agenda, as well as to respond to national goals and local priorities. There are indications that insufficient coordination between the national, regional, and local planning efforts is a key factor behind the failure to stay on track.

To help address this shortfall, planners from Region Blekinge in southeast Sweden engaged academics from Blekinge Institute of Technology to facilitate a scenario planning approach over a 30-year horizon (to 2050) with involvement of regional, local and some relevant national stakeholders in its implementation.

This transdisciplinary case study focusses on how this approach was useful for bridging the different levels of planning and for supporting cross-sectoral participatory input for sustainable growth scenarios in the Blekinge Region. These scenarios should also be able to reveal practical pathways for a regional sustainability transformation. The scenario creation process resulted in broader conversations between various independent bodies for greater co-ordination and integration between organisations and their sustainability goal setting. In particular, four main scenarios were investigated to cover the likely effects of high and low regional sustainability efforts and high and low

population growth, respectively. Further insights and their potential implications for other contexts were also discussed.

IV. Presentation (short):

Storytelling as a Transdisciplinary Tool for Disentangle Local Energy Challenges

Giulia Sonetti[1], Ruth Mourik[2], Rosie Robinson[3]

[1]Politecnico di Torino; [2]Duneworks; [3]Anglia Ruskin University, Global Sustainability Institute

Keywords: transformation processes, multi-stakeholder collaboration, sustainability, urban challenges, energy policy

Contemporary dialogue between the latest research into multi-stakeholder working techniques and local policy implementation, whilst undertaken very effectively in specific cases, is not widespread; crucially this means learnings are not always shared in either direction. One such technique, which this paper aims to disseminate and analyse, is storytelling. Storytelling (and narrative-based work more generally) methods are seen to offer an effective route to both understanding and communicating real-life (necessarily subjectively interpreted) experience, which after all is the context in which energy transitions must ultimately take place. This paper contrast the lessons learnt from using storytelling in a local energy policy context to what literature states about the potential of storytelling for solving complex challenges and facilitating collaborative processes. It focuses in particular on the potential of storytelling in contributing to sense making, learning and unlearning, creating empathy, creating collaborative and conflict solving attitudes, and the potential contribution of storytelling to creating collaborations, new agendas and actions. In order to do this, the paper draws on a very large-scale storytelling roll-out: a set of 17 multi-stakeholder workshops across 17 European countries run as part of the SHAPE ENERGY (Social sciences & Humanities for Advancing Policy in European Energy) project between November 2017 and June 2018. A core part of the platform's work was to explore on-the-ground challenges facing those working in practical energy initiatives, including at a local policy level, and how Social Sciences & Humanities insights could help address these. Results provide insight on whether/how storytelling in the workshops did contribute to discuss certain topics which may be less likely in other contexts / via other methodologies. Four elements emerged as being discussed due to the storytelling methodology: i) the relationship between stakeholders (trust, mistrust, power, etc); ii) the complexity of the issues as played out on a local level; iii) clear perspectives of end users and their needs; iv) concrete actionable ways forward for implementation. Conclusions highlight the steps to undertake to use storytelling as a transdisciplinary tool for multi-stakeholder local energy policy platforms.

V. Presentation (short):

How transdisciplinary research can engage with systems thinking and scenario planning through Bayesian Networks: The case of climate change impacts on water in the Maghreb region

Laura Woltersdorf

Institute of Physical Geography, Goethe University Frankfurt, Germany

Keywords: Systems thinking, scenario planning, Bayesian Network, water, climate change

Climate change impacts on water are a critical challenge for the development of societies in the semi-arid Maghreb (Morocco, Algeria, Tunisia) requiring important transformation processes in the region. At the same time, projections of future climate change and its impacts on water vary widely even for specified greenhouse gas emissions scenarios due to the significant uncertainties of both climate and impact modeling. Our aim is to find ways how to integrate information on climate change impacts on water with quantified uncertainty into participatory risk assessments so that such information can be utilized optimally for deriving adaptation measures.

The first step towards achieving this aim is to determine the system under consideration and develop plausible scenarios for future developments in the region in a participatory manner. This involves co-producing and integrating knowledge from an interdisciplinary team of scientists (from environmental science engaged in investigating transdisciplinary research methods, hydrological modeling, human geography and physics) as well as the expertise from local representatives of water ministries, meteorological services and NGOs engaged with climate change impacts on water. Bayesian Networks are a well-established method for representing complex systems and for integrating qualitative and quantitative transdisciplinary knowledge, uncertainties, as well as climate and management scenarios. In order to build such a Bayesian network representing well the current and future system, we first conducted semi-structured expert interviews. Then, with each expert we co-produced perception graphs, a type of causal map that visualizes the actor's perception of a particular problem field and hence makes it accessible to others, as it contains the relationships between the actor's goals, the factors affecting the achievement of the

goals and actions that impact the factors, and thus the goal achievement. The perception graphs of each expert then served the scientists to build a Bayesian Network model structure, which has then been presented to selected experts in a first workshop. Different management scenarios will also be discussed with experts in a second workshop.

The result of this transdisciplinary co-development process is a co-developed Bayesian Network model structure that visualizes the perspective of multiple scientists and practitioners, representing well the current and future system including projections of climate and hydrological models and uncertainties as well as management scenario considerations. On this basis, the most important system components, links between them and changes in the system due to different scenario assumptions can be clearly visualized and accessible for all transdisciplinary research partners: variables from climate and hydrological projections indicating the physical climate hazards in the region (i.e. groundwater recharge, net irrigation requirement due to climate, runoff), variables related to management scenarios (i.e. water reuse, water transfers to other basins, irrigation efficiency) as well as water-related climate change risks (i.e. groundwater abstraction to recharge ratio, return period with surface water abstractions equal to runoff).

As a further step, the co-developed Bayesian Network will serve to integrate model output information of climate change impacts on water and support local participatory risk assessments for developing better adaptation measures.

SCIENCE MEETS PRACTICE: REFLECTIONS ON DOING TRANSDISCIPLINARY WORK FROM A LEARNER'S PERSPECTIVE

Thursday, 12.09.2019, 08h40 – 10h20
[Nordamerika]

Organiser(s): Jenny Lieu[1], Maria Andrade[2], Claudia Beck[1], Mohammad Hatamjafari[3], Francesco Femi Marafatto[4,6], BinBin J. Pearce[5], Lisa Deutsch[6]

[1]ETH Zurich, Switzerland; [2]TU Munich, Germany; [3]University of Duisburg-Essen, Germany; [4]Paul Scherrer Institut; [5]ETH Zurich, Switzerland; [6]EAWAG, Switzerland

The proposed session is an integrated mix of individual presentations, a multimedia display and a panel discussion to share with the audience the story of how an interdisciplinary team with limited or no prior experience in transdisciplinary (TD) research applied TD methods and principles in a community planning context. The example is drawn from the 'Science meets Practice" 2019 Winter School conceived and organized by the ETH Zurich Transdisciplinary Lab. Winter school participants were presented with the dilemma a small Swiss village is currently facing. Wislikofen, a town of 325 inhabitants, is undergoing a merger with neighbouring communities. To potentially support Wislikofen in developing a long term vision for its community, participants of the TdLab Winter School, doctoral as well as Master's students and post-doctoral researchers were tasked with designing and carrying out a community event that would help the community to reflect upon, question and/or make progress on its future vision. Based on the winter school experience, the session will address the following questions: 1) How has your own research approach changed since becoming more familiar with TD principles? What has been the impact of this change? 2) What did you learn from stakeholder interactions and how does that inform your view of TD?

In the first part of the workshop, we will describe and reflect on the process of how a team of 20 early career researchers from 14 different countries were trained in basic TD approaches and how they engaged in the intervention bringing together different mindsets. In the second half of the workshop, we will present the TD methods the project team applied in the intervention, including tools from the Td-net toolbox. The community response to the intervention will allow us to discuss and generalize the learnings obtained from the TdLab Winter School example to other contexts.

Session schedule

10 min. Introduction of the TdLab Winter School and key transdisciplinary principles
Play 2-3 minute video of the winter school
5 min. Clarification questions and a transition activity

50 min. Panel session: How can TD principles support team building?

Presenters discuss their personal experiences at Winter School and how these impacted participants' professional and personal outlook since then.

- Storytelling format through 4-5 individual, participant perspectives
- Meaning-making activity to structure the individual stories
- How the community itself responded to the interactions

5 min. *Clarification questions and a transition activity*

20 min. Questions and reflections from audience

Key readings

Pohl, C., Krütli, P., & Stauffacher, M. (2017). Ten reflective steps for rendering research societally relevant. *GAIA-Ecological Perspectives for Science and Society*, *26*(1), 43-51.

THE RURAL-URBAN NEXUS: A TRANSDISCIPLINARY INNOVATION PLATFORM TO ESTABLISH NUTRIENT LOOPS FOR IMPROVING CITY - REGION FOOD SYSTEM RESILIENCE ACROSS AFRICA (RUNRES)

Thursday, 12.09.2019, 08h40 – 10h20

[Asien]

Organiser(s): Benjamin Wilde[1], Chris Buckley[2], Alfred Odindo[2], Pius Kruetli[1], Cathy Sutherland[2], Rob Slotow[2], Marc Schut[3], Speciose Kantengwa[3], Simon Shibru[4], Johan Six[1], Leonhard Spaeth[1]

[1]ETH Zurich; [2]University of KwaZulu-Natal; [3]IITA, IITA; [4]Arba Minch University

Keywords: Nutrient recycling, agriculture, sanitation, sustainability, transdisciplinary innovation platform

Unprecedented urban growth is placing enormous burdens on governments across Africa. Demand for infrastructure, services, and basic needs such as housing, water, sanitation, and food security is growing and state agencies are struggling to meet this growing demand. Although this trend towards urbanization is driven by various flows, migration from rural to urban regions is the dominant contributor to the burgeoning population growth being experienced by African cities. Rural outmigration is driven by a decreasing ability to maintain a satisfactory and sustainable livelihood in rural areas of the continent. Researchers have coined the decision making dynamic drawing rural residents to urban zones, despite the squalid conditions and poor job opportunities, as a push factor. Simply put, rural communities find it increasingly difficult to survive. Although a complex issue driven by factors such as a rapidly evolving global economy and an increasingly erratic climate, nutrient mining plays a major role in this phenomenon. African farmers, hindered by a lack of financial capital, are unable to apply fertilizers at the rates necessary to produce sufficient and competitive yields, forcing them to search for economic opportunity elsewhere. As a consequence, informal settlements, unplanned urban zones and peri-urban areas are growing rapidly. These underserved communities have limited access to potable water or municipal sanitation services and suffer from chronic food insecurity. This lack of appropriate sanitation, combined with high population densities, creates an environment suited to the outbreak of waterborne diseases such as cholera and dysentery. Furthermore, rates of food insecurity in these settlements are amongst the worst on the continent. Together these development challenges make the urban poor amongst the most vulnerable populations in the world. Thus, efforts that seek to improve livelihoods across the rural-urban nexus are critical to socially equitable and ecologically sustainable development in Africa.

Trandisciplinary research evolved out of a realization that traditional, disciplinary modes of academic knowledge production have been unable to address societal challenges (Pohl, 2011). As such, three principles form the core of the TD approach: 1) there is a clear focus on socially relevant issues; 2) TD seeks to transcend and integrate academic disciplines; 3) it demands equitable participation from all involved stakeholders (Pohl, 2011; Wickson, et al, 2006). The development challenges articulated above comprise a multidimensional and complex set of problems, the "wicked" challenge articulated by Rittel and Webber (1973). As such, traditional disciplinary problem framing has proven insufficient to address these critical societal challenges.

RUNRES seeks to address these issues by identifying, testing, and installing innovations (related to waste-recycling and small-scale processing) that can improve the resilience and sustainability of regional food systems in four different city region food systems across Africa: Arba Minch, Ethiopia, Kigali, Rwanda, Bukavu, Democratic Republic

of the Congo, and Msunduzi, South Africa over eight years. By operationalizing a theory of change, we will catalyze a circular economy for resilient city region food systems that can provide a more sustainable alternative to the current food system. Critical to this goal is the establishment of a vibrant and inclusive transdisciplinary innovation platform in each of the city region food systems. This will entail the identification and inclusion of key stakeholders, the identification and testing of selected innovations, and the acquisition of a comprehensive baseline understanding of the biophysical and socio-economic circumstances for each city region food system. Thus, we consider this research to be an ideal platform upon which to base a session designed to stimulate discussion on two critical transdisciplinary questions: 1) how can a theory of change contribute to a sustainable transformation? and 2) what forms of organizing are needed for institutions, agencies, companies, and universities to handle the necessary transformations, with particular reference to collaboration between stakeholders?

We envision a session that will begin with a brief introduction to RUNRES. This will focus on describing the dual development challenges of inadequate sanitation and food insecurity, and how solutions to these issues, while traditionally viewed as disparate problems, in fact contain a great amount of potential synergy. After providing this necessary context, an interdisciplinary team of contributors from RUNRES will conduct a panel discussion. This will focus on addressing how the adopted transdisciplinary approach has impacted overall project success. In particular, we will reflect on the RUNRES theory of change, as well as the challenges inherent in bringing together such a diverse and complex set of stakeholders to effect the specified societal transformation. Finally, this focused discussion will be opened up to address these two themes more broadly.

PLENARY III: METHODS FOR TRANSDISCIPLINARITY

Thursday, 12.09.2019, 10h50 – 12h30

[Wallenbergsalen]

Sophia Kaså[1], Christian Pohl[2]

[1]Mistra Urban Futures and Katalysator, Sweden; [2]ETH Zurich, D-USYS TdLab, Switzerland

Joint interactive keynote: Methods for Transdisciplinarity and How to Use Them

Sophia Kaså, Mistra Urban Futures and Katalysator, Sweden

Christian Pohl, ETH Zurich, D-USYS TdLab, Switzerland

Co-creation is most needed when we face complex challenges. The challenges where there is no known best practice. When it is obvious that no party has the answer or even the ability to find the answer by themselves but when transdisciplinarity is required. When it takes a multitude of perspectives and experiences to jointly explore and find ways forward. In these cases, the answers lie in diversity and at the same time diversity in itself is a big challenge and a potential pitfall.

Over the last decade several collections evolved that suggest methods and tools for co-creation, such as the Team Science Toolkit, the Tools for Integration and Implementation Sciences and td-net's toolbox for co-producing knowledge. These collections showcase the diversity and plurality of tools and methods to be used in transdisciplinary projects. Td-net's toolbox furthermore connects the methods with challenging situations a leader of a transdisciplinary process might find him or herself in. These methods and tools are usually described as if using them would mean to follow a well-defined stepwise procedure. The practical use of methods, however, is flexible and situational and requires know-how and skills in facilitation.

Facilitation is a mean to balance the different interests embedded in a transdisciplinary project. The level of facilitation needed is dependent on the complexity of the task and also associated to the backgrounds of the participants in the project. Facilitating is the skill to host that creates scaffolding, a structure and a safe container, where enough chaos can be brought in for co-creation to happen and new things to be born. There is not a single method for this, what is needed is rather an ability to identify and combine the methods that best supports the work at hand. We would like to share some experiences of how this can be done and frameworks of thought that we've found helpful.

PARALLEL SESSIONS IV

ENABLING SOCIAL LEARNING AND SOCIETAL CHANGE (COMPOSED SESSION)
Thursday, 12.09.2019, 13h40 – 15h20
[Wallenbergsalen]

I. Presentation:
Co-producing knowledge for societal change: Reflections on ten years of the CityLab programme in Cape Town
Warren Michael Smit, Mercy Brown-Luthango, Liza Rose Cirolia, Rike Sitas
University of Cape Town
Keywords: knowledge co-production, cities, sustainable urban development

This paper reflects on ten years of knowledge co-production in Cape Town through the African Centre for Cities/ Mistra Urban Futures CityLab programme. The paper first examines the context of Cape Town, then discusses the CityLab programme as a response to the challenges and opportunities in Cape Town. The paper then focuses on how criteria were developed for evaluating the impact of the CityLab programme, and concludes by identifying key preconditions for the successful design and implementation of co-production processes.

The CityLab programme was initiated by the African Centre for Cities (ACC) in 2008 as an interdisciplinary applied research programme on sustainable urban development, intended to deal with real issues in a way that overcame disciplinary divides and the policy-practice divide. When ACC became the anchor of the Mistra Urban Futures Cape Town Local Interaction Platform in 2010, the CityLab Programme became one of the main programmes of the platform.

The CityLabs were essentially about bringing together relevant stakeholders to co-produce policy-relevant knowledge on the key urban challenges facing Cape Town, such as housing/informal settlements, crime and violence, climate change, and high rates of ill-health/disease. In all, there have been nine CityLabs, but this paper focuses on the second phase of the programme, which consisted of four CityLabs: Healthy Cities; Sustainable Human Settlements: Urban Violence, Safety and Governance; and Public Culture. The CityLabs involved bringing together academics, government officials, civil society, students, etc, in meetings/workshops, field visits and collaborative writing processes to co-produce joint publications that reflect a range of experiences and views (such as edited books, for example, on climate change adaptation/mitigation in Cape Town and on informal settlement upgrading). In addition, most of the CityLabs also involved undertaking collaborative research with innovative methodologies (such as the body mapping research of the Healthy Cities CityLab), co-producing new policies (e.g. the Human Settlements CityLab, which involved collaboration with the Western Cape Provincial Government on a new human settlements policy framework), capacity development (such as the national course for officials on addressing violence through upgrading, run as part of the Urban Violence, Safety and Governance CityLab), and co-designing and implementing innovative projects (e.g. the Public Culture CityLab, which implemented public art projects across Cape Town).

As co-production processes are different to conventional academic research processes, new criteria for evaluating the success of these processes had to be developed. These criteria included the extent to which different stakeholders were brought together (as reflected in participation in transdisciplinary workshops/seminars and research/writing processes), the extent to which different types of knowledge were integrated and created (as reflected by co-produced academic and non-academic outputs) and the extent to which the processes resulted in positive changes in policies and practices (as reflected in new policy/strategy documents and evidence from practitioners and from participant observation). The CityLabs were successful in meeting most of these criteria for success. The preconditions for this success were: (i) Having a pool of flexible funding that enabled the CityLabs to have open-ended approaches (i.e. identifying key stakeholders and bringing them together to decide on key issues and collaborative activities); (ii) Recruiting CityLab coordinators who were able to straddle the academic research/policy and practice divide (most came from an NGO background); (iii) Strong support from key stakeholders, particularly the City of Cape Town, Western Cape Provincial Government and University of Cape Town.

II. Presentation:

Review of 20 transdisciplinary research cases: towards understanding the effects of design features on social learning

Agathe Osinski[1], Pauline Herrero[2], Tom Dedeurwaerdere[1]

[1]Université Catholique de Louvain (Belgium); [2]Université de Pau et des Pays de l'Adour (France)

Keywords: Transdisciplinarity, Transformative research, Social learning, Sustainability transitions

Our research contributes to the theme of "societal transformation", one of three streams explored by this year's International Transdisciplinary conference, by addressing the specific question: *what experiences in initiating and fostering transformation processes do we have and what can we learn from them?*

The research project we propose to present has two parts.

The first part aims at exploring in a systematic way the design features of transformative transdisciplinary research processes and the social learning that these processes generated among participants. To this end, we undertook a comparative analysis of twenty completed or nearly completed transdisciplinary research projects in the field of sustainable development. Over several months, we conducted interviews with the main investigators of transformative transdisciplinary research projects in order to understand their experience in the design of the approach they took. We examined how social learning was embedded in the interaction processes between new scientific knowledge, practitioners' life-world experiences and social experimentation.

The analysis highlighted that the clarification of actors' normative orientations, the collective co-construction of the research question and practical problem situation, as well as the balancing of power asymmetries were the most important criteria for the generation of social learning. Most importantly, their combination systematically increased the strength of the social learning generated in the cases we analysed. In some specific cases of transdisciplinary research, other criteria such as active facilitation modes and the presence of collective interest advocacy organisations played an important role in the generation of social learning.

The second part aims at investigating the working of these criteria in the design of a transdisciplinary project on food transition with an organisation working with the urban poor, in order to encourage the generation of transformative learning processes. In our presentation, we propose to briefly reflect on these by outlining the process and preliminary conclusions of the transdisciplinary project undertaken, through the analysis of ex-ante and ex-post interviews with the project participants.

III. Presentation:

Transdisciplinary approaches in sustainability of socio-ecological systems studies. A methodology proposal for implementation and evaluation in three contrasting case studies. (Colombia, France & Mexico)

Aurélie Chamaret[1], Driss Ezzine de Blas[2], Jose Alvaro Hernandez[3], Clara Ines Villegas Palacio[4], Céline Lutoff[1], Nicolas Buclet[1], Sandra Lavorel[5]

[1]University Grenoble Alpes, France; [2]CIRAD (French agricultural research and international cooperation organization); [3]El Colegio de México; [4]Universidad Nacional de Colombia, Medellín; [5]CNRS, France

Keywords: Transdisciplinarity, evaluation, socio-ecosystems

There has been growing injunctions to conduct research projects in a transdisciplinary (TD) approach, whether to respond to increasingly complex societal issues or to develop better quality research ("The best research is produced when researchers and communities work together", 2018).

Despite much work on the interest of these approaches, few comprehensive evaluations of transdisciplinary processes have been conducted. The majority of them are based on measuring the number of scientific publications, which does not reflect at all the relevance, credibility, and legitimacy of the research and its results for society (Hansson and Polk, 2018). However, evaluation is useful for several reasons (Wall et al., 2017): (1) evaluating the actual results of TD's approaches, (2) communicating on these effects if they exist, (3) benefiting from feedback to improve future processes and (4) assisting in the implementation of approaches.

Many research and methodological questions arise in conducting such a process: what is being evaluated (process, effects, outcomes)? How to measure (indicators, more global evaluation system)? Can an evaluation system be generic? Who should conduct the evaluation (internal or external expertise)?

The Trajectories and Trasse projects focus on the adaptation of mountain and watershed socio-ecosystems to global changes in three countries: Colombia, France and Mexico. These projects affirm a strong willingness to conduct transdisciplinary research to help stakeholders move towards greater sustainability. However, the stakes are high because methodological developments are necessary, transdisciplinarity being a relatively imprecise concept for a

large number of (academic and non-academic) actors involved in projects. In this perspective, the idea is to co-develop between researchers, for a first step, a process for evaluating the evaluation approaches. What we are trying to experiment in this work is based on two main pillars:

- how can an evaluation approach be a support to help implement a transdisciplinary process? What would be the benefits of having a kind of a shared quality charter/methodological guide from the beginning of a process, notably in terms of power relationships?
- Which aspects or dimensions of such an evaluation would be usable in a transversal way in any of the projects' contexts and which would need to be specific?

The paper will present the framework we will have developed within the projects and a first test of it in an ex-ante use.

References

Hansson, S., Polk, M., 2018. Assessing the impact of transdisciplinary research: The usefulness of relevance, credibility, and legitimacy for understanding the link between process and impact. Research Evaluation 27, 132–144. https://doi.org/10.1093/reseval/rvy004

The best research is produced when researchers and communities work together, 2018. . Nature 562, 7–7. https://doi.org/10.1038/d41586-018-06855-7

Wall, T.U., Meadow, A.M., Horganic, A., 2017. Developing Evaluation Indicators to Improve the Process of Coproducing Usable Climate Science. Weather, Climate, and Society 9, 95–107. https://doi.org/10.1175/WCAS-D-16-0008.1

IV. Presentation (short):

Emergence from a living laboratory site for transformative change

<u>Aditi Rosegger</u>, Cynthia Mitchell

Institute for Sustainable Futures, University of Technology Sydney

Keywords: living laboratory, transformative change, water governance, Auroville, action research

This presentation will explore Auroville, an international intentional community that has as its collective aim human unity in diversity, as a site for transformative change as it reconceptualises its water future. Auroville, which self-describes as a living laboratory comprising over 3000 individuals from 58 nationalities, is located in the state of Tamil Nadu in south India. Tamil Nadu is one of the most water-stressed areas in the world: sinking water tables and seawater intrusion are leading to severe social-economic and environmental issues, threatening livelihoods and both food and water security. Climate change and rapid growth have led to poor recent monsoon rains which are predicted to become increasingly variable in the future global change scenarios, with extreme rainfall events increasing and low-intensity rainfall events decreasing. In spite of Auroville's transformative history of water management that has led to the reforestation of a once barren plateau (Blanchflower 2005), Auroville now needs to address looming water scarcity issues that also threaten the surrounding region. While Auroville is attempting to address these issues, it has not yet been able to tap into a space that can trigger the necessary transformations in its water governance. The impetus for engaging in this research originates from the motivation to work towards transformations to appropriately address and adapt to these changing conditions; to learn about what the unique setting of Auroville has to offer this process of transformative change and knowledge generation; and to trigger mutual learning for all participants in this research. This flows into the outcome spaces framework for transdisciplinarity (Mitchell, Cordell & Fam 2015) that identifies stocks and flows of knowledge, mutual learning and improvement of situation as indicators for transdisciplinary research.

Triggering long-term transformative change that outlasts this research appointment requires gaining access and tapping into the sense-making of this unique context. This in turn requires participatory engagement and advocates for a collaborative action research approach. In order to identify the appropriate leverage points, a first cycle of action research has been undertaken to engage the sense-making of community members. This first cycle employed interviews and discussions around the topic of water informed and enriched by the systems thinking method of 'rich pictures.' Analysis of these preliminary interactions revealed a coherent set of meaning-making levels in the narratives of this reflexive community, being individual, social and environmental. The reflections that emerged from this process will be shared, alongside elaborations of potential ways forward for enabling sustainable water governance through an action research process. The potentials and challenges of engaging in such a 'site for change' are explored in the context of generating transformative change. The sharing of insights and emergence from this

reflexive community that self-describes as a living laboratory could further knowledge, understanding and learning for instigating transformative change elsewhere.

Key Readings

Blanchflower, P. 2005, 'Restoration of the Tropical Dry Evergreen Forest of Peninsular India', Biodiversity, vol. 6, no. 3, pp. 17–24.

Mitchell, C., Cordell, D. & Fam, D. 2015, 'Beginning at the end: The outcome spaces framework to guide purposive transdisciplinary research', Futures, vol. 65, pp. 86–96.

V. Presentation (short):

FutureTalks: A Case Study in Transdisciplinary Co-production for Transformative Urban Sustainability

John Robinson[2], Stephen Williams[1], Blake Poland[2], Cheryl Teelucksingh[3], Wendy Wong[2], Tamer El-Diraby[2], Kim Slater[2], Pani Pajouhesh[2], Gregoire Benzakin[2]

[1]University of British Columbia; [2]University of Toronto; [3]Ryerson University

Keywords: Citizen engagement, climate change, urban sustainability

Can citizen engagement be configured to meet the evolving challenges of climate action and sustainability in urban areas? Cities are a key source of transformative change, where the degree of change required demands deep and meaningful engagement with our communities. However, effective methods for cultivating this type of engagement, particularly at larger scales, remain elusive for most decision makers. Our project, FutureTalks (FT): Community Co-creation for Transformative Urban Sustainability, will address these needs by conducting groundbreaking research on community engagement, involving 100,000 residents of Toronto, in partnership with public, private and civil society organizations. Our transdisciplinary approach to creating and testing new approaches to urban policy and decision-making integrates input from the public and our partners and combines this with interdisciplinary analysis. It involves partners as co-creators in problem definition, methods development, analysis and evaluation of alternative options and interpretation of results. The results will inform urban policy-making in Toronto and significantly advance our understanding of how to effectively engage citizens in critical issues about the future of the city.

Working with our partners, we are developing and implementing community engagement processes that use dialogical methods to explore and evaluate alternative futures for Toronto to the year 2050 at an unprecedented scale. We will do this in ways that include, and are respectful of, the many diverse communities and interests that exist in a large city, with a particular focus on equity-seeking and underrepresented groups. A key objective is to discover what future conditions are considered desirable by the many diverse communities of Toronto, how these preferences interact and may be combined, and their implications for policy and community action.

The focus of our work is on issues of climate change and urban sustainability, which are central preoccupations of cities around the world. We will address the complex interplay among specific sustainability problems (energy, water, biodiversity, mobility, social justice, etc.) that are often treated separately. Our engagement strategies will ask Torontonians to develop scenarios that explore the desirability, feasibility and consequences of different development path trajectories.

We have been working with our 15 partners for over two years in the co-design of this project. We are currently engaged in 3 funded pilot projects with FT partners and have other projects under development. This work has produced a co-developed methodology for both large-scale (high tech) and face-to-face (high touch) engagement processes. Our partners will continue to be actively engaged in the governance, design, and management of FT activities. We will build on the extensive engagement activities currently being developed and implemented by our partners, and develop new forms of engagement to extend and integrate these activities.

This project will test various approaches to community engagement and evaluate the societal impacts and effects of our engagement activities, in terms of their efficacy and representativeness, their short and longer-term impacts and their potential contribution to sustainability transitions.

This presentation will provide an overview of the project with a specific focus on transdisciplinary co-production methods of partnership development and collaboration. We will present the results of a recent FutureTalks symposium with partners. Symposium participants were guided through an assets mapping exercise that revealed opportunities for working collaboratively and leveraging resources in service of these intersecting mandates as part of, and independent from, the FutureTalks project.

ROLES AND CAREERS FOR TRANSDISCIPLINARIANS (COMPOSED SESSION)

Thursday, 12.09.2019, 13h40 – 15h20
[Europa]

I. Presentation:

Who is doing inter- and transdisciplinary research, and why? – An empirical case study of motivations, attitudes, skills, and behaviours

Mª Helena Guimarães[1], Cristian Pohl[2], Marta Varanda[3], Olivia Bina[4]

[1]Landscape Dynamics and Social Processes Group, Institute of Mediterranean Agricultural and Environmental Sciences (ICAAM) Évora University; [2]Transdisciplinarity Lab USYS TdLab, Department of Environmental Systems Science, ETH Zurich; [3]SOCIUS/Instituto Superior de Economia e Gestão, Universidade de Lisboa, Lisbon, Portugal; [4]Instituto de Ciências Sociais, Universidade de Lisboa; Geography and Resource Management, the Chinese University of Hong Kong

Keywords: Interdisciplinarity, transdisciplinary individuals, academic career trajectory, academic system, INTREPID

We witness a persistent tension between established ways of knowledge production through disciplines, and the urgent need to widen and change, both the production of knowledge and its organization, not least, in order to be able to understand and address the future and its challenges. Witnessing a growing call for inter- and transdisciplinarity (ITD), we set our goal to learn more about scholars who engage in this kind of research by asking these questions: What characterizes inter- and transdisciplinary researchers (ITDRs)? To what extent do these characteristics help ITDRs deal with the challenges of an academic career path? We address both questions by comparing the findings from the relevant literature and semi-structured interviews with ITDRs at different stages in their careers. Our results bring the ITDR personality a step further in taking a form. ITDR personalities can be characterized by a particular mix of motivations, attitudes, skills, and behaviours. However, the academic environment and its career paths do not seem prepared and adapted for such ITDR personalities. Furthermore and in contrast to the literature, the T-shaped training (first, disciplinary depth and then, ITDR) is considered one possible career path, with the other one being a specialization in facilitating knowledge integration and in developing theories, methods, and tools for ITD. Our analysis concludes by exploring the future of ITD if formal training and learning would be available and if the contextual conditions would be more conducive to undertaking this type of research.

II. Presentation (short):

Chance, balancing act, challenge – doing PhDs in transdisciplinary projects

Sebastian Rogga, Jana Zscheischler

Leibniz Centre for Agrolandscape Research (ZALF)

Keywords: transdisciplinary research; PhD students; early career researchers

The call for science that contributes to the transformation of societies requires new research approaches that challenge the existing academic system. The bearers of academia of tomorrow are the young scientists of today. They must gain experience during their training as to how transformative research works. What could be more reasonable than to do a PhD in transdisciplinary projects?

The scientific qualification in the context of a transdisciplinary research process, however, confronts many early career researchers with major challenges. They are asked to qualify into an academic discipline; still they do their research in a project environment that considers itself decidedly "undisciplined". Further dilemmas exist between the (partly self-imposed) demand for scientific excellence and practical relevance; between practicality in the project and keeping time resources available for the scientific work, between heteronomous topics and the desire to pursue one's own research interests.

So far, there is little systematic knowledge about the feasibility, opportunities, and risks for doctoral candidates in transdisciplinary projects (Fry et al. 2006). Most recently, studies have been published that highlight the situation of young researchers in transdisciplinary projects, but they mostly take the perspective of project coordinators in so-called junior research groups (c.f. Ruppert-Winkel, C. et al. 2015; Jaeger-Erben, M. et al. 2018).

The presentation will reflect on results of a workshop that was carried out with more than 20 PhD candidates and supervisors from nine transdisciplinary research projects in Germany. The workshop took place at the end of the five-year funding time span of the nine projects in February 2019. Thus, the results serve as an ex-post reflection on the individual experiences that have been gained. The aim was to uncover and discuss the advantages and disadvantages of doctoral studies in transdisciplinary research projects for one's own career in and outside of

academia, to identify specific challenges, to derive strategies and to create more transparency on the situation of PhD students overall.

The results show that the threshold for PhDs to enter and work in transdisciplinary projects has become lower, thanks to an increased number of jobs and improved education opportunities in the management area. It enables PhD students to successfully perform various non-PhD related tasks in transdisciplinary projects that traditionally have been covered by senior scientists. The acquired competences gained from TD research (especially soft skills) are seen as major advantages by PhD candidates. On the flip side of the coin, PhD students report on their deficiencies in scientific performance and in scientific reputation. Even though the practical relevance of a TD project is generally welcomed, difficulties to generate sound research questions and, subsequently, research outputs are pervasive. Doing a PhD project in transdisciplinary projects not only mean performance under difficult conditions but also less reputation among the peer groups of junior researchers.

Key Readings

Fry, G.; Tress, B.; Tress, G. (2006): PhD students and integrative research. In: Bärbel Tress (Hg.): From landscape research to landscape planning. Aspects of integration, education and application. Dordrecht: Springer (Wageningen UR frontis series, v. 12), S. 193–205.

Jaeger-Erben, M. et al. 2018. Building Capacities for Transdisciplinary Research: Challenges and Recommendations for Early-Career Researchers. GAIA 27/4 (2018): 379 – 386.

Ruppert-Winkel, C. et al. 2015. Characteristics, emerging needs, and challenges of transdisciplinary sustainability science: Experiences from the German social-ecological research program. Ecology and Society 20/3 Art. 13.

III. Presentation:

New roles for researchers in system innovations: case study of the Knowledge-Action Programme on Water

Laurens Hessels[1,2], Michaela Hordijk[3], Andrew Segrave[1]
[1]KWR Watercycle Research Institute; [2]Leiden University; [3]University of Amsterdam

Sustainability transitions require transdisciplinary knowledge production, going beyond traditional role divisions. In order to contribute to system innovations, researchers often engage in action research, and participate actively in system innovations. This configuration raises questions about their role and position with regard to the practical context, about quality assurance and about intervention legitimacy: how intensively should they participate, and how do they preserve their unique contribution as a researcher.

Existing literature about the rise of transdisciplinary research provides some building blocks for understanding the complex relationships in these situations. There is some literature about the different roles researchers can play in action research for sustainability, but so far the literature has limited sensitivity to the way researchers combine and balance different roles. In particular the role of social scientists is understudied. The research question of this paper is: what roles are required of social scientific researchers in system innovations and what are the advantages and disadvantages of the combinations of roles that can be adopted?

Our theoretical framework builds on transition literature and studies on the role of researchers in sustainability science and action research. We will apply and problematize the analytical framework by Wittmayer and Schäpke, who claim that sustainability researchers typically encounter four key issues: ownership, sustainability, power and action. This corresponds with five roles of researchers, reflecting how they deal with these issues: the reflective scientist, process facilitator, knowledge broker, change agent and self-reflexive scientist (Wittmayer and Schäpke 2014).

The paper analyses a case study on the Knowledge Action Programme on Water (KAPW), a transdisciplinary initiative on innovative water governance carried out in the Netherlands (2017-2019). The main aims of KAPW are to address the governance challenges that water authorities experience in sustainability transitions, and to more effectively link ongoing research and knowledge generation to decision making processes. KAPW is a particularly interesting case because of its action-oriented, dynamic and reflexive nature. Over the course of the past few years, it has shifted its focus and strategy repeatedly, in response to its changing policy context and internal reflections. These reflections highlighted the need to change the self-understanding of researchers and our role in the process, and to redefine the expectations from researchers in processes like KAPW. Our data sources include 45 interviews, analysis of (online) documents, and self-reflection of the authors, who are personally involved in the program.

In the paper we will analyse which key issues the researchers of the programme have experienced and which (combinations of) roles they have adopted in response to these issues. KAPW researchers faced several dilemmas,

such as providing answers or formulating questions, active participation versus systematic documentation and producing scientific publications versus societal relevance. In addition there were some issues with ownership (appropriation of results versus collective branding of the program), sustainability (defining the circular economy and sustainable energy) and power (negotiations between the water authority, infrastructure utility and municipality). KAPW researchers have adopted and integrated several roles, most prominently the knowledge broker, process facilitator and change agent. In many instances researchers struggled with a combination of roles, because of the conflicting values and demands associated with them. For example, while practitioners frequently asked for the guidance and leadership of a process facilitator, researchers were looking for space to act as a knowledge broker or self-reflexive scientist.

Based on this analysis we will enrich the framework of Wittmayer and Schäpke with additional issues and with insights into the relationships and interactions between the different roles.

Key Reading

Wittmayer, J. M., and N. Schäpke. 2014. Action, research and participation: roles of researchers in sustainability transitions. Sustainability science 9:483-496.

IV. Presentation:
How not to be an expert – Strategic questioning as an approach to support learning and transformation
<u>Stefan Hilser</u>
Leuphana University
Keywords: Reflexivity, Roles of the Researcher, Learning, Facilitation, Strategic Questioning
Scientific and social problem and goals:

Transdisciplinary research aims to integrate a great diversity of knowledge, values and assumptions, as well as being solution-oriented, or even transformative. This requires a widened view of research and the roles of researchers as agents of transformation. However, this also risks overburdening researchers that focus on supporting mutual learning and knowledge co-creation and integration with too many roles and expectations. This is especially true for early career researchers like me. Formative Accompanying Research is an approach that aims to support researchers in this challenging endeavour through "learning with, for and about the research team" (Freeth & Vilsmaier, in review). As part of the research group "Processes of Sustainability Transformation", it has been my task as a formative accompanying researcher to support the other PhDs and their mutual learning processes. In this position the challenge of fulfilling different roles, being member of the team, being a facilitator and being an observer has been there from the start. Based on this perspective I have developed an approach to answer the question of:
How can we support researchers as agents of transformation, without overburdening them?

Research Process and methods:

From this perspective, I will first narrate in more detail, how these challenges emerged as part of my own research and how this has transformed my view on learning and research. I will further describe how this transformation has helped me to develop an approach to my research that allows me to fulfil these different roles, while also lowering the risk of overburdening myself as a researcher. The resulting approach is built upon strategic questioning (Peavey, 1994) and Paulo Freire's ideas of Praxis (action & reflection) and critical pedagogy. I tested this approach through conducting Walking dialogues with the PhDs, as well as focus group interviews and a deep listening approach. Strategic questioning and deep listening aim at inducing change in an empowering way. The walking dialogues will be analysed using discourse analysis as well as multivariate statistics.

Ways to impact:

The approach touches upon questions of how to conduct transformative research without imposing solutions, but empowering participants and giving them agency. It can further help researchers to how to deal with their different roles and gives indications on how to deal with situations, where they are not the expert. This also helps to reduce the burden on researchers in the field of transformative research, as well as the field as a whole.

Key readings:

Peavey, F. (1994). Strategic questioning. Insight and Action: How to Discover and Support a Life of Integrity and Commitment to Change. New Society Publishers, Philadelphia.

Wittmayer, J. M., & Schäpke, N. (2014). Action, research and participation: roles of researchers in sustainability transitions. Sustainability Science, 9(4), 483–496. https://doi.org/10.1007/s11625-014-0258-4

HOW CAN RESEARCH FUNDING PROGRAMMES ENHANCE TRANSDISCIPLINARY CO-PRODUCTION OF KNOWLEDGE?

Organiser(s): **Flurina Schneider[1], Tobias Buser[1,2], Catherine Lyall[3], Isabelle Providoli[1], Zarina Patel[7], Katsia Paulavets[5], Vivi Stavrou[5], Christian Eismann[6], Antonietta Di Giulio[4], Rico Defila[4]**

1Centre for Development and Environment CDE, University of Bern, Switzerland; 2Td-net, Academies of Arts and Sciences, Switzerland; 3School of Social and political Science, The University of Edinburgh; 4Research Group Inter-/Transdisciplinarity, Program Man-Society-Environment (MGU), University of Basel, Switzerland; 5International Science Council ISC, Lira 2030 Programme; 6Intra3; 7University of Cape Town, South Africa

A growing number of actors emphasize the need for transdisciplinary (TD) co-production of knowledge as one way of making research part of needed societal transformations. But as the field of TD research has developed, many scholars have pointed out how the prevailing research context shaped by current science policy is persistently unfavourable to TD modes of knowledge production; TD requires conditions that differ from those needed for basic disciplinary research (Dedeurwaerdere 2013; Kläy et al. 2015; Kueffer et al. 2012; Schneidewind 2009). However, while there is an increasing body of literature about TD research at the project level, very little research has focused more specifically on issues related to science policy, in particular, on how different structures of overall research funding programmes relate to successful enhancement and implementation of such research (Schneider et al. 2019). Research funding bodies increasingly acknowledge the importance of TD research, yet their management, evaluation, and funding practices often do not reflect this (Woelert and Millar 2013). For example, there is much evidence that interdisciplinary and TD research proposals have difficulty obtaining funding, since reviewers typically apply disciplinary perspectives and quality criteria instead of considering the integrated whole (Bromham et al. 2016; Mansilla 2006; Woelert and Millar 2013). Moreover, (classic) academic careers are still typically built on measuring scientific impact according to publication in peer-reviewed journals – journals that are more interested in the scientific part of TD research, not in the efforts of such research to contribute to actual societal transformations (Kueffer et al. 2012; Rhoten and Parker 2004). Consequently, for TD research to reach its full potential, experts argue that far-reaching structural and institutional changes are needed in the way academic organizations are managed, organized, and funded and in how TD research is treated by research funding bodies (Dedeurwaerdere 2013; Defila and Di Giulio 1999; Kläy et al. 2015; Kueffer et al. 2012; Schneidewind 2009).

With third-party funding increasingly required for research, research funding programmes and bodies now play a crucial role in science policy (Braun 1998; Bromham et al. 2016; Lyall et al. 2013) and, consequently, in possible changes to the science policy context. Funding bodies strongly influence what kind of research programmes get launched, what research proposals get funded, what kinds of impacts are valued, what networking and capacity-building opportunities are possible, and what sort of career experience is considered valuable in applicants for funding.

In order to address this gap, this session focuses on how research funding programmes can enhance transdisciplinary co-production of knowledge in different contexts. By doing so, we try to unravel the potential and limitations of different approaches and activities, and to enhance learning between the programmes.

To learn from different meta-level studies that accompany TD funding programmes, the session includes 6 short talks (10 min), followed by a joint discussion addressing the following guiding questions.

1) What activities were implemented by the funding programmes to foster TD? In particular,
   a) how did they support the three core elements of TD research (joint problem and goal definition, co-production of new knowledge and contributions to societal transformations)?
   b) how did they support TD on the level of the projects (project support) and on the level of the entire programme (e.g. synthesis)?
2) How and to what extent did the programmes foster the project's capabilities in engaging in TD?
3) What methodological designs were applied and developed by the accompanying, meta-level research to support the programmes? In particular,
   c) how was the collaboration between the meta-level research and the programmes organised?
   d) what concepts, tools and frameworks have been developed?

4) What are key learnings for future programme development?

This session is linked to a session where representatives of research funding institutions discuss how research funding for enhancing societal transformations can be enhanced.

Talks:

Research Funding Programmes Aiming for Societal Transformations: 10 Key Stages. Flurina Schneider et al. will present a generic model and design recommendations for TD research funding programmes, developed jointly with key actors involved in four Swiss research funding programmes: the National Research Funding Programme NRP61 on sustainable water management, the NRP68 on sustainable use of soil as a resource, the Swiss Programme for Research on Global Issues for Development (r4d programme), the NCCR North-South focusing on Research for Mitigating Syndromes of Global Change.

Supporting the Swiss NRP 72 on One Health and antimicrobial resistance

Isabelle Providoli et al. will present insights from an accompanying research on interdisciplinarity in the Swiss NRP 72. The aim of the study was to support the programme's steering committee in navigating challenges and opportunities of interdisciplinarity related to the emerging One Health approach. To generate a holistic understanding of the approaches and activities of both, the programme level and the individual projects, the study team tested the above mentioned generic framework.

Accompanying research as a catalyst for integration? Experiences with German research funding bodies

Antonietta Di Giulio and Rico Defila will present their experiences in conducting accompanying research to German research programmes. These experiences cover two different types of accompanying research (meta type and integration-oriented type, see Defila and Di Giulio 2018) and one type of supporting activity (coaching) for three different funders in Germany. In the presentation, these approaches of how different funders have supported the projects and/or the programmes and the concepts and tools that were developed by the accompanying research will be explained, and the potentials and limitations of these approaches will be compared.

[Fostering](#) transdisciplinary in the German Programme "innovation groups for sustainable land management"

Christian Eismann will present first results on how the projects have benefited from (and struggled with) the new programme elements. The funding programme "Innovation Groups for Sustainable Land Management" may be a milestone for German transdisciplinary research. It covers very heterogenous projects on the energy system transformation, urban-rural relationships and new methods of farming. The programme administration developed a bundle of new means and requirements to support the projects by their common goal to create solutions ready for application. Among other things, the proposal writing phase was financed, the project duration was extended from the usual three years up to five, the project's practice partners received a significant funding, and the projects had to create an innovation concept. However, for the project members it was a demanding balancing act of doing serious scientific research while being confronted with the high expectation to achieve effect and create practical outcomes for the project regions and the society. The new elements of the programme's structure produced uncertainties too, on both sides.

A UK Perspective on ITD Research Funding Programmes

Catherine Lyall will talk on ITD research funding in UK. "Transdisciplinary" research is not a mainstream activity in the UK and is rarely supported per se by funders of research. Yet, although UK research policy does not fund overtly "transdisciplinary" research programmes, it does firmly embrace the concepts of research that is interdisciplinary and that involves potential research users in some form of "knowledge exchange". Indeed, British academics are now explicitly assessed on the extent to which their research has an impact on external audiences. This presentation will illustrate this apparent contradiction with reference to examples of UK research that is, to all intents, transdisciplinary if not in name.

ICS's LIRA 2030 in Africa

Katsia Paulavets et al. will talk on the LIRA 2030 Africa programme and how it supports African early career scientists to undertake TD research on sustainable development in the urban context. Based on the experiences of the LIRA projects, the intervention will focus on what it takes to undertake TD research in the African context, what enabling environment it requires and what institutional structural changes are needed.

Key Readings:

Schneider, Flurina, Tobias Buser, Rea Keller, Theresa Tribaldos, und Stephan Rist. 2019. „Research Funding Programmes Aiming for Societal Transformations: Ten Key Stages". *Science and Public Policy*. https://doi.org/10.1093/scipol/scy074.

Defila R., Di Giulio A. (2018): What is it good for? Reflecting and systematizing accompanying research to research programs. In: GAIA, 27(S1), 97-104. https://doi.org/10.14512/gaia.27.S1.17

URBAN CHALLENGES AND TRANSFORMATIONS II (COMPOSED SESSION)

Thursday, 12.09.2019, 13h40 – 15h20
[Sydamerika]

I. Presentation (short):

Decoding social constructs towards acceptability and sustainable implementation of decentralized waste-water treatment system in African informal settlements: A Tanzania case study

Dickson Wilson Lwetoijera[1], Alfred Boniphace[1], Beda Levira[1], Phumlani Sikhosana[2], Chris Buckley[2]
[1]Ifakara Health Institute; [2]University of Kwazul-Natal

Keywords: Transdisciplinary, Informal settlement, DEWATs

Over 80% of Dar es Salaam inhabitants are in informal settlements that are characterized by on-site sanitation facilities, which is unsafe and often poorly managed. In absence of reliable sanitation services, difficulty accessibility of empty truck into the settlements coupled with financial constrains, the produced wastewater are being discharged while untreated into the ground, rivers, or storm water. These practices don't only expose to and blight lives of many in these communities from water borne disease such as cholera and diarrheal, it also urgently call for innovative solutions to address the situation.

Owing to the unplanned nature of these informal settlements, Decentralized wastewater treatment systems (DEWATs), onsite sanitation based solution offers a promising and cost-effective option, and its efficiency in treating sewage water has been well established. However, implementation framework for the adoption of this technology by the private and government sectors hasn't been addressed. Using transdisciplinary approach, we have mapped key stakeholders; with whom the project has formulated inputs towards policy recommendations for operationalizing and maintaining decentralized water treatment systems at wider community.

In addition to implementing the project in the communities where DEWATs has been constructed; the project team in Tanzania have learned and documented success narratives/stories on sanitation efforts in eThekwini Municipality in Durban, South Africa. Specifically under this project we, we have able to: - 1) review existing sanitation guidelines to identify gaps and challenges for DEWATs technologies in Tanzania; 2) mapped stakeholders and collected their opinions, incentive for involvement, and forces/pull factor(s) that maintain togetherness among stakeholders; 2) demonstrated knowledge integration processes amongst stakeholders.

II. Presentation:

Challenge Driven Innovation in Urban Planning - Unpacking Transdisciplinarity in Practice

Anna Sundman, Karin Kjellson, Magnus Björkman, Maja Westman
Theory Into Practice

Keywords: Co-production, Challenge Driven Innovation, Radical Change, New Normal, Transition, Innovative Architecture & Urban planning

The reproduction of "known solutions" has urban planning in a firm grip, and creates a real challenge for practitioners wanting radical change to meet Agenda 2030 criterias. Many stakeholders, large investments and long time perspectives challenge any proposed idea, and it's nearly impossible to induce change as a sole actor.

How can we consciously work for change, and in architecture and urban construction test sustainable solutions that have not been tested before?

As practitioners in the field of architecture, we wanted to give ourselves the perfect conditions to succeed and take an active role as challenge driven actors with useful assets in the spatial and architectural knowledge. We realised from the outset that we, as an "innovation lab" must have a different operating model than the classic architectural office. Consultancy work with normal debit rate and innovation "as time goes on" does not support us enough in perceived meaningfulness and competence development, and it becomes difficult to achieve anything out of the ordinary. To propose new ways of working and claiming new roles for practitioners, we needed a new practice based agenda to create radical or disruptive change.

- Our practice based research method entail
- Initiating change

- Creating a platform for co-production, trust
- Building common ground in the team
- Developing visionary scenarios and alternative futures
- Building legitimacy
- Backing up with practice based results
- Real testbeds living labs

An example from practice

Mo-Bo is a practice based architectural initiative, that develop/test/experiment with innovative architecture and integrate Mobility as a Service (MaaS) in housing development. The goal has been to find a transformative solution, to alter car-centered planning and transition from parking spaces to mobility as a service. The project was initiated by Theory into Practice, but has grown to a practice based research platform consisting of municipalities, academia, service providers, architects, landscape architects and developers.

In comparison to traditional project set up, this has required an extended responsibility and also increased ownership/engagement in the project. It has balanced out (altered) more traditional roles between actors (consultant, developer, municipality), which loosen boundaries and allows for knew knowledge creation.

Results

- The work has resulted in live tested alterations within urban planning with a unique Detailed Development Plan
- New typology for service based architecture, consisting of new shared space for inhabitants
- Increased efficiency norm in housing development
- Transdisciplinary transition

Conclusions

Co-production platforms in practice are needed to address challenges in architecture and urban planning. To build up a transformative capacity multiple skill sets are needed for complex societal issues. These complex trust based structures have the capacity to alter existing norms, and with the right support can become a strong practice based lead innovation towards a more sustainable development.

III. Presentation (short):

Moving from multidisciplinary practice to interdisciplinary process, to meet societal challenges within sustainable urban regeneration

<u>**Josefine Wikholm**</u>

White Arkitekter

Keywords: Interdisciplinary process, climate neutral urban regeneration, resilience, participatory social science

What experiences in initiating and fostering transformation processes do we have and what can we learn from them?

Within urban planning and the architecture practice there is a long history of working *multidisciplinary*, involving many competences. The process may be based on "business as usual", were friction and risk are eliminated throughout the process. The time we live in demands rapid change to meet climate change and transformation into resilient communities. For the International Transdisciplinary Conference, White Arkitekter is presenting a case where transformation and innovation was key factors and a team need to be in the processes together *interdisciplinary*. In such processes we need to open the process and change how power is distributed within the team and set goals and visions that connect to the necessary societal transformation. Our case was initiated by a collaboration of the international organization C40 and the city of Oslo. C40 is a network of the world's megacities committed to addressing climate change. Together with 40 cities around the globe, the city of Oslo joined forces to host the land allocation competition. Land allocation competitions is normally a part of "business as usual" but can also be used as a powerful political tool to involve developers to fulfill political visions.

The program given by the C40 was based on 10 sustainable challenges. The 10 challenges called for an intricate, open-minded and open-ended process to meet the challenges. The challenges needed to be met by specific knowledge with new professions at the center of the process, working together interdisciplinary, instead of the traditional developer-architect relationship. Our case study demonstrates how new transdisciplinary demands in society need new ways to involve the private market. The complex societal problems and goals to act on climate change askes for new incitements given by the city planning authorities to stimulate the private sector. It also puts demands on the intradisciplinary process of the team that will come up with innovative solutions. The C40 competition "Reinventing Cities", made an open call for teams that wanted to act on climate change. 40 sites in

approximately 20 countries participated. Three teams on each site prequalified through a prequalification. The ten challenges given by the C40 and a site-specific program of our site Fossumdumpa by the Oslo authorities gave our team our preconditions. To meet the challenges, our inventive developer set up a team with wider knowledge and we planned for an interdisciplinary process that combined different working models to obtain the requested result and made the different professions contribute to the same goals and same design process. Our team consisted of Norske Helsehus (developer focusing on housing and health), INCITA (developer for plus-housing concepts) architects (White), landscape architects with eco system and water expertise (Cowi, White), social sustainable expert (White), climate neutral building expertise, IOTA smart cities, Sopra Steria smart cities, Oslo International HUB (entrepreneurial organization for youth), Norenegy (innovative local energy technique for production and storage, SINTEF Byggforsk (Norwegian research center). To organize the process, we combined different methods. A value-based method to organize core, vision, goals and the ten challenges transformed into strategic projects. Architects and sustainable experts organized their common process within a climate neutral design method, and a participationary method was developed to involve the citizens to act on their own healthy and sustainable lifestyle, supported by physical and social design and smart cities technology. Ideas were made measurable in a monitoring protocol that emphasizes the design phase, building phase and operational phase. With transdisciplinary requests cities can act on the climate challenges and monitor the result.

IV. Presentation (short):
Collaborative learning in Multi-Stakeholder Initiatives for a Transformation of the Textile Industry: The Case of the German Partnership for Sustainable Textiles and its initiative to improve working conditions in the textile and clothing industry in Tamil Nadu, India.

<u>Felix Beyers</u>
Leuphana University, Faculty of Sustainability Science, Institute of Sustainability Governance, Lüneburg, Germany

Scientific and societal problem and goals:

The textile and clothing industry make up a large part of the world economy and represent significant challenges for the environment and humanity at the global level. The textile sector, for example, is still associated with poor and inhumane working conditions in producing countries. As a result, multi-stakeholder initiatives have emerged that aim to find global governance solutions to social and environmental challenges. They consist of various actors between industry, state, and civil society working together to gain insights from all relevant perspectives. Here, collaboration, exchange and negotiation potentially help to stimulate the co-creation of knowledge among participants and lead to innovative solutions.

Therefore, this study focusses on the collaborative interaction and investigates how multi-stakeholder governance partnerships co-create knowledge that aims to transform the textile industry.

Research process and methods:

To answer this question, a case study approach is used, investigating an initiative that has been initiated by the Partnership for Sustainable Textiles in Germany. The Partnership for Sustainable Textiles was initiated by the Federal Government as a private governance platform and comprises around 130 participants. In addition to the goal of promoting global governance through individual corporate responsibility, the partnership is also based on joint commitment and mutual support. Here, actors of the partnership jointly initiate projects that aim to bring about local change in textile-producing countries. The initiative under examination aims at a systemic improvement of labour in the textile and clothing industry in Tamil Nadu, India. Together with partner organizations in India, it was implemented around the lack of compliance committees in spinning mills to significantly improve working conditions of women and young girls in particular.

Through interviews, observation and participatory actor mapping, this study strives for insights to answer in what way knowledge is spread throughout the network. It then uses the method of social network analysis to investigate and unpack these learning processes over time between the various actors in Germany and India. It also discusses how such interaction creates space and opportunities for mutual learning and co-creation of knowledge.

Expected Results:

The expected results show if and how the German Partnership for Sustainable Textiles with its project in Tamil Nadu creates space for knowledge creation and collaborative learning among participants. It will also show how industry representatives are able to engage in these processes and learn from and together with civil society and state actors. The study will serve as a contribution to the German Partnership for Sustainable Textiles by analysing knowledge co-creation processes and providing practical recommendations. It will show how innovative methods and transdisciplinary research can help to promote these processes.

INTERCULTURALITY - BRIDGING EPISTEMOLOGIES (COMPOSED SESSION)

Thursday, 12.09.2019, 13h40 – 15h20
[Nordamerika]

I. Presentation:
A critical, southern eye on transformative adaptation

<u>Alice McClure</u>[1], Lulu Van Rooyen[2], Patrick Martel[2], Anna Taylor[1], Lorena Pasquini[1], Chipo Plaxedes Mubaya[3], Rudo Mamombe[3]

[1]University of Cape Town; [2]University of Kwa-Zulu Natal; [3]Chinhoyi University of Technology

Keywords: cities, transformative adaptation, learning

Transformative climate change adaptation (TA) is on the global sustainable development agenda. This concept is often used in a normative sense, as government, practitioners and civil society are encouraged to integrate TA into their objectives and operations. This relatively new concept is, however, often still abstract and difficult to ground in varying geographical or social contexts. Furthermore, evaluating the efficacy of TA is generally reliant on qualitative criteria and subjective decisions related to what counts as systemic change. There is a need to explore how TA realizes in different places, while acknowledging the potential opportunities that the notion offers. For example, what does TA look like in rapidly developing southern contexts with limited resources? What are the trade-offs involved in TA, particularly when there are competing financial interests? Who benefits from these trade-offs and who loses out? What are the barriers and opportunities to achieving TA in such circumstances?

The *Transforming southern African cities in a changing climate* project seeks to contribute to this critical debate by bringing together theoretical perspectives and empirical evidence from science with grounded thoughts of practitioners working in Durban (South Africa) and Harare (Zimbabwe) to explore how the concept of TA lands in southern African city context. Transdisciplinary methods, including emergent project design within a diverse team, grounded in context to answer relevant questions, as well as experimental learning labs in cities, have been key in the ongoing learning and knowledge co-production processes between researchers and societal stakeholders in these cities. *Transforming African cities in a changing climate* is part of the LIRA2030 programme, which aims to increase the production of high-quality, integrated (inter- and transdisciplinary) solutions-oriented research on global sustainability by early career scientists in Africa. Findings from the project will contribute to growing knowledge on initiating and fostering transformation processes using transdisciplinary methods, particularly from a southern perspective.

II. Presentation:
'Culture-blindness' and its consequences for transdisciplinary research in sustainable development

<u>Kim Liv Gordon</u>

The University of Melbourne, Australia

Keywords: Indigenous knowledge, traditional knowledge, culture, epistemology, sustainable development

This paper is intended as an exploratory piece to open up broader conversations about the role of culture – broadly conceived - in transdisciplinary research for sustainable development, particularly when working with Indigenous peoples and custodians of traditional knowledge. It contributes to the 'theoretical development' stream of the ITD conference, addressing the question, "What are the core challenges in transdisciplinary research regarding ontological and epistemological issues – what worldviews and paradigms are challenged and what kind of knowledge is included and produced?"

The integration of Indigenous and traditional knowledge (ITK) into sustainable development, and the co-production of locally relevant actionable knowledge is increasingly regarded as essential to the implementation and long-term success of environmental management. A mounting body of evidence worldwide has drawn strong links between

cultural and biological diversity, and the need for more nuanced understandings of cultural dynamics in transdisciplinary sustainability research (Arora-Jonsson, 2016). Numerous studies within climate change resilience and adaptation literature have pointed to the urgent need to consider the socio-ecological dimensions of biodiversity conservation.

However, the term 'culture' is rarely explicitly mentioned in environmental research dominated by the natural and economic sciences, nor in the literature on sustainable development derived from ecological concerns (Soini and Birkeland, 2012). Rather, culture tends to be subsumed under 'social' dimensions of sustainability and is often less valued than what are perceived to be 'non-cultural', more readily identifiable or quantifiable social, economic or ecological factors. My presentation argues that this constitutes a form of 'culture-blindness' to Western science's own cultural and epistemological paradigms. This manifests in normative practices and perspectives that have consequences that can be particularly problematic when conducting transdisciplinary research involving Indigenous or traditional owner communities.

Drawing on examples and case studies of cross-cultural environmental research, suggestions are made for how self-reflexive approaches to design and decision-making might be more inclusive of various aspects of culture, such as language, gender norms and worldviews (Weltanschauung). It argues for more explicit recognition of the importance of cultural contexts and values in sustainable development, suggesting that culturally-grounded natural resource management and biodiversity conservation policies, programs and projects will enable more holistic and equitable outcomes.

The idea that the management of ecosystems is a political, social and cultural process is considered within the context of increased global recognition of inclusiveness as a core principle of research and policy design - recently given prominence by the adoption of the Nature's Contributions to People (NCP) framework by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) (Diaz, et. al., 2018). Inclusive and ethical methodologies in transdisciplinary research encompass not only the validity of a broader range of academic disciplines, but also recognition of the legitimacy of Indigenous, traditional and local knowledges and an extended notion of peer communities and stakeholders. This calls for greater self-reflexivity and awareness of the cultural, political and historical situatedness of the normative assumptions and values that researchers bring to sustainable development agendas (Schneider, et. al. 2019).

Key readings

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III. Presentation:

From Reverse Innovation to Global Innovation through multilingual collaboration

Kristina Pelikan[1,2,3], Jakob Zinsstag[1,2]

[1]Swiss TPH; [2]University of Basel; [3]TU Berlin

Keywords: Reverse innovation, multilingualism, communication, translation

"In brief, reverse innovation (RI) refers to new ideas and solutions adopted and tested in low- and middle-income countries (LMICs), which subsequently spread to high-income countries (HICs)" (Zinsstag et al. 2019). RIs provide solutions that are not previously discussed in HICs for several reasons (ibid.) – therewith, RI does not belong to the best known topics of research. Scientific research on RI is scarce at the moment, but with the tendency to increase in the future. RIs are supposed to be sustainable and constitute an important chance for tackling environmental and societal problems in HICs. Reverse innovation pertains also as important model approach to social and public health innovation, as a model for RI in global health (Depasse et al. 2013). HICs should be more interested in supporting RI as it includes a high potential of innovations from more than half of the world. For example, tools developed in Tanzania and Ghana for mapping population health needs could also be applied in European countries. And methods of dog rabies vaccination coverage in Bamako, Mali, helped to identify the most sensitive parameters for access to

health care (Mosimann et al. 2017) of which large areas in southern Germany, Switzerland and Italy could similarly benefit as these methods help to improve coverage of childhood vaccination programs. Capitalising RI requires mutual learning for change and therewith a prosperous collaboration between all involved parties in a transdisciplinary setting. For enabling RI, the approach of intercultural transdisciplinarity needs to be introduced here. Intercultural transdisciplinarity shall be defined here as the inclusion of all different cultures (national, disciplinary etc.) involved in the transdisciplinary research process by emphasising and making use of the benefits of their interaction with each other (Zinsstag et al. 2019). Translations play an essential role here - if the translation is flawed, important cultural and behavioral aspects are ignored. Monolingualism, as it is practiced with English as Lingua Franca in science more and more, carries the risk of losing multiple meanings about culture, behavior, emotions and connotations. We highlight that interlingual and intralingual multilingualism in combination with different asymmetries lead to a huge amount of unused potential in RI as well as conscious/unconscious exercises of power in research partnerships. This results in epistemicide and therewith in questions of power, followed by a loss of knowledge acquisition. With mindful, self-reflexive intercultural transdisciplinary approaches, RI could exploit its full potential on tackling health and various societal problems. But therefore, the awareness of the importance of multilingualism (and translations) for epistemic wealth needs to be increased. In this way RI becomes Global Innovation (GI), as the exchange of information and knowledge is pluri-directional within multi-centred research partnerships. With GI partnerships, dichotomies like "North-South" or "RI" become obsolete and contribute to equity and the decolonization of international research.

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Mosimann L, Traore A, Mauti S, et al. A mixed methods approach to assess animal vaccination programmes: The case of rabies control in Bamako, Mali. Acta tropica 2017; 165: 203-15.

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IV. Presentation:
Transdisciplinary dialogue of wisdoms for societal transformations

Adriana Moreno Cely[1], Dario Cuajera[2], Cesar Escobar[2], Nelson Tapia[2], Tom Vanwing[1]
[1]Vrije Universiteit Brussel; [2]Universidad Mayor de San Simon

Keywords: Transdisciplinarity, dialogue of wisdoms, societal transformations, indigenous knowledge

The impoverishment of rural areas in the Plurinational State of Bolivia is increasing due to many factors such as migration, climate change and social exclusion, among others. In a country, where external knowledge prevails, and where the capacities and knowledge of rural indigenous communities are underestimated, there is an urgent need to find alternatives that recognize the value of all types of knowledge to face the complex challenges affecting rural areas. A south-initiative project, involving North-South partnership, proposes an eclectic model, deep-rooted in decolonial praxis to promote actionable knowledge and collaborative learning. Actionable propositions are those that actors can use to implement effectively their intentions. The model combines elements of transdisciplinarity and participatory action research approaches. Using circles of dialogue as a participatory method that combine the ideas of David Bohm on dialogue and the principles of ancestral indigenous ritual, called the word circle. The objective of the project is to promote collaborative learning, among the participants, and societal transformations by: (i) Offering contextualized knowledge spaces where students, professors and researchers from different background undertake their research. And (ii) promoting a transdisciplinary dialogue of wisdoms, in which the local indigenous communities, the university, social organizations, NGOs and public and private institutions take part.

The project proposes an alternative learning approach through a basic learning program aimed at local actors. In which, local indigenous leaders as co-researchers, interact with the interdisciplinary team of the university. To promote this collaborative learning process, it is necessary to initiate a dialogue where all participants (1) recognize the other as equal, (2) accept that there are different equally valid forms of knowledge and (3) take on the challenge of building from the differences. The articulation is a participatory and transdisciplinary dialogue of students, professors, researchers and co-researchers with other stakeholders (civil servants, social organizations, NGOs, public and private institutions). It allows to join efforts to improve multi-stakeholder involvement, committed to inclusive development of their territories. The functioning of these collaborative learning spaces depends to a large extent on the institutional and personal commitment of the participants, as well as in the process of actively involving the inhabitants of the community, by sharing and discussing the lessons learned.

The role of academics in a participatory and transdisciplinary process is crucial to adapt inclusive and decolonizing methodologies, by seriously considering the position, knowledge and needs of the actors. Academics should initiate the breaking of the supremacy of scientific knowledge by incorporating local indigenous knowledge and cosmovision. The educational process goes beyond the walls of the university, only assuming the challenge of bringing together all kinds of knowledge, we could have the opportunity to face the complexity of the real-world and fostering knowledge and societal transformations.

POSTER SESSION (PART II)

Thursday, 12.09.2019, 13h40 – 15h20
[Foyer/Lobby]

I. Double jeopardy within Swedish Integration: Using South-North collaborations to explore the role of gender within transdisciplinary integration projects

Shelley Kotze[1,2], Mirek Dymitrow[2,3], Lilian Omondi[4]
[1]Business Region Gothenburg; [2]Mistra Urban Futures; [3]University of Gothenburg; [4]Maseno University

Keywords: Double-jeopardy, immigration, gender, South-North collaboration, integration

Sweden is a highly multicultural society. Due to its increasing immigrant and refugee populations it has developed lauded policy, most particularly within the formal opportunities offered to immigrants when accessing the labour-market (MIPEX). However, the index does not measure the outcomes of such policy. The OECD data (2013) is placing Sweden at the bottom of its ranking, as it has the largest gap of its 31 countries with 57% of 15-74 year olds born outside of Sweden are in employment, compared to 67% of native-born Swedes.

A possible reason for the gap is the relatively high proportion of native-born women in employment. But, when immigrant employment numbers are explored along gendered lines immigrant women's levels of employment are consistently 10% lower than immigrant men's. This not only creates a gender gap between immigrant men and women, but also a gap between native-born and immigrant women. As such, immigrant women are experiencing a double-jeopardy in labour-market integration, both as women and as immigrants.

Studies exploring instances of the double-jeopardy problem have already been conducted in the US (De Jong et al 2001), Canada (Boyd 1984), Australia (Foroutan 2008) and Israel (Reijman & Semyonov 1997). However, this research is still considered novel as it addresses ways in which gender is being used to inform the process of integration, mainly approached through labour-market access in Sweden.

It is suggested that the misuse of the concept of gender is sustaining the identified gaps between immigrant men and women, and immigrant women and the native population in Sweden. Preliminary discussions and previous research suggest this is caused by the positioning of women within certain stereotypical roles, including: a) the generalisation of immigrant women as a heterogeneous group who lack education and cultural acumen; b) the undervaluing of the domestic roles that women take within their households and communities; and c) the cultural insensitivities of the facilitators of integration initiatives.

This presentation explores how the hypothesis of double-jeopardy plays out in practice. The aim of our research is to understand the ways in which different approaches to labour-market integration apply the concept of gender, and how this affects the tangible outcomes for the women involved. This will be undertaken through a South–North collaboration, using a Swedish-Kenyan collaboration programme within Mistra Urban Futures – SKILLs, aiming towards sustainable urban development.

Drawing upon experiences and reflections from works of academics, researchers and NGOs, our research applies a gender analysis of local case studies from impoverished areas of Gothenburg. The discussion is informed by challenges (and solutions) identified in Kisumu, and provides a set of co-produced recommendations. The following research questions are pursued:

1) How does labour-market integration consider and use the concept of gender?
2) What effect(s) does the use of gender have upon the outcomes for women within labour-market integration projects?
3) How can the use of the concept of gender be improved within labour-market integration to provide outcomes for women that are equal, fair and sustainable?

This presentation focuses on the findings of the research project by providing an overview and explication of the hypothesis of double-jeopardy within Swedish labour-market integration. Initial findings suggest that gender as a concept is experienced differently by immigrant women and Swedish women. In questioning how women from the global South experience integration projects in the context of the global North, the collaboration has identified the following aspects: development of agency; poor choice of approach; cultural insensitivity; role modelling; stereotyping and; tokenism – within projects from both research sites. With all these challenges in mind, integration projects may prove problematic at best and unsuccessful at worst because of this under-researched dimension.

II. TREND (TRansdisciplinary ENgineering Design) Research Group

Susan Lattanzio, Linda Newnes, Alex Huktin
University of Bath

Keywords: transdisciplinary engineering, transdisciplinary engineering research

Over the past few decades transdisciplinarity (TD) has been the subject of increased discourse in the context of large, complex, ill-defined, 'wicked' problems. However, there has been less consideration of the potential it offers within the practice of engineering. The TREND (TRansdisciplinary ENgineering Design) research group is funded by the UK Engineering and Physical Sciences Research Council. The purpose of the funding is to support research to maximise the future economic and societal value of UK manufacturing through innovative manufacturing practice. The specific aim of the group is to enable effective TD working within engineering organisations, where it is considered to be appropriate. The outputs of the group will be a (1) a TD Index which allows practitioners to identify their current level of disciplinarily for a business process; the preferred level of disciplinarity for that process; and the tools (e.g. process, method, software), required to move the process to an effective TD state. (2) A tool kit of pre-existing TD enabling tools. (3) The creation of new TD enabling tools. Over the five year project the team will first conduct a literature review to understand the state-of-the-art of disciplinarity within engineering academic literature. Following, 'foraging' case studies of 50-100 engineering businesses will be undertaken as a means to compare and contrast the academic and industry contexts. Finally, 'Deep-Dive' case studies, with suitable industry partners, will map specific processes and assess the effectiveness of links and bridges between the process stages.

III. Transforming education and research through an Honours Programme. Case: Transdisciplinary Insights KU Leuven.

Jorge Ricardo Nova Blanco, Griet Ceulemans, Andreas De Block, Anne-Mieke Vandamme
KU Leuven

Keywords: Transdisciplinary research, honours programme, higher education institutions, societal challenges.

Universities are usually structured along disciplinary lines, training students and scholars in specific domains. The expertise acquired allows in-depth research within a domain, leading to breakthroughs and innovation. Yet, the division and subdivision into disciplines, the specialization into particular domains and the silo culture are sometimes hampering universities in addressing complex challenges in a cross-disciplinary way. Transdisciplinarity as a method bridges those disciplines, while also involving co-creation with stakeholders and thus opens new perspectives for research and education, improving its societal relevance. However, implementing transdisciplinary education and research is a challenge because of conservative disciplinary structures and often a 'blue sky' attitude. Responsibilities and funding channels are not adapted to transdisciplinary initiatives.

KU Leuven is organized in three main groups of sciences (Biomedical, Humanities and, Science & Technology) facilitating mono, multi, and within-group interdisciplinary research. In 2016, three professors from the three groups of sciences launched the Institute for the Future - KU Leuven, as an incubator that supports, catalyzes and accelerates transdisciplinary research, aiming at developing innovative, alternative solutions, scenarios, policies and/or transition thinking for current and future societal and global challenges. The ethical framework is within the sustainable development goals.

It was not easy to implement transdisciplinary courses overarching the three groups of sciences at KU Leuven. However, university-wide Honours programmes were allowed and the Institute for the Future launched "Transdisciplinary Insights" at the master level. While professors and students from the three groups of Sciences are involved, the Honours Programme "Transdisciplinary Insights" still needed to be housed within one discipline, currently the Institute of Philosophy.

Given that credits for honours programmes are not counting for the masters degree we are typically reaching highly motivated students. They are willing to move out of the traditional way of thinking and under guidance of a coach, they collaborate with peers from other disciplines and stakeholders on specific challenges submitted by members of

the university, the industry, the government or society. The students receive training in transdisciplinary methodologies, and together with stakeholders, they co-create 'Transdisciplinary Insights' that are published in the open access e-journal Transdisciplinary Insights, created for this purpose. They typically propose a potential partial solution, or a position paper. Some challenges have run over multiple years before the ideas become mature enough to stimulate a new research line or the implementation of a partial solution.

So far, sixty students have completed the programme, from ten disciplines, and twelve countries on six challenges: vaccine hesitancy, HIV drug resistance in Africa, counseling parents after prenatal screening for Down syndrome, a blueprint for a future, resilient, and equitable society, future perspectives for dairy farms in Flanders, the prosumer concept in a circular economy. Seven professors and three Ph.D students have been involved as (co)-coaches, along with more than twenty-five stakeholders from university, society, government, and industries. One of the trained students started a Ph.D, successfully obtained funding, and gathered a number of research groups and stakeholders for further research and investigation of ways to implement changes for the challenge.

Although, the Institute for the Future and the Honours Programme Transdisciplinary Insights have demonstrated to the university the benefits of implementing Transdisciplinarity in the curriculum and having a dedicated incubator for Transdisciplinary research ideas, scaling up this approach is not obvious because of the high work load and the lack of funding. We need other ways to attract more bachelor and master students, since we believe that each student should be given the opportunity to experience Transdisciplinarity and get some skills in communication, co-creation of knowledge, sustainability, system thinking, and problem-solving. Such skills are essential for their professional development.

IV. Concept for Formative Evaluation in Climate Services

Susanne Schuck-Zoeller[1], Herrmann Held[2], Elke Keup-Thiel[1]
[1]Helmholtz Zentrum Geesthacht, Climate Service Center Germany; [2]Hamburg University, Germany

How do empirically existing roles in the scientific community match with the science-society interaction models?

The recently funded Helmholtz-Institute for Climate Service Sciences (HICSS) bridges research at Hamburg University and the boundary institution Climate Service Center Germany (GERICS), which is part of the Helmholtz-Zentrum Geesthacht. One of the projects to be performed in HICSS is dedicated to **Normativity, Objectivity and Quality Assurance of Transdisciplinary Processes.** Within this project one of the two work packages examines transdisciplinary dialogues and their *formative evaluation*. Already existing methods have to be tested and adapted according to the climate service projects which serve as exemplary cases. New methods should be taken into account, as well.

The monitoring of co-development processes during the practical phase of the HICSS project will firstly deliver experiences on the application of the respective methodologies in the field of climate services. Out of which a draft concept for a formative evaluation methodology shall be derived. Secondly, the monitoring phase will deliver empirical insights into the quality of transdisciplinary research. By relating these insights to theoretical science-society models, another work package is to reveal different role models of stakeholders and relate them to science-society models and their normativity. Findings from the climate service field, which is the focus of the project, are then to be transferred to other research fields.

We understand this project as a proactive measure to establish a normatively informed concept for quality assurance in the context of transdisciplinary research. Therefore, one of the main objectives is to develop guidelines for co-creation projects in HICSS.

The poster will describe and discuss the idea of the project, that is going to start in fall. It contributes to the discussion on the quality of transdisciplinary research activities.

V. Integration of end users in the process of developing an innovative urban climate model - testing and evaluating the prototype

Bettina Steuri[1], Matthias Winkler[2], Sebastian Stadler[2], Sebastian Stratbücker[2], Jörg Cortekar[1], Steffen Bender[1]
[1]Climate Service Center Germany (GERICS) at Helmholtz-Zentrum Geesthacht Zentrum für Material- und Küstenforschung GmbH; [2]Fraunhofer-Institut für Bauphysik IBP

Co-development has become a buzzword over the past years – it seems that stakeholders should be involved in nearly everything. But how can successful stakeholder engagement be implemented? We will provide insights from

the large German research and development project *Urban Climate Under Change [UC]²* (http://uc2-program.org/en), which aimed at the development of a prototype urban climate model called PALM-4U. Since the model should be scientifically innovative and at the same tome user-friendly for users in urban planning practice, the entire project followed a transdisciplinary approach. Therefore, partners from science (model development and data assimilation) and partners from practice (user requirements, testing and evaluation) were integrated throughout the three-year project.

UseUClim (https://uc2-klimoprax-useuclim.org), one of four subprojects, reviewed the PALM-4U´s practicability with the aid of the living lab approach. This approach was structured into three phases: 1) exploration, 2) experimentation, and 3) evaluation. In phase 1, the user requirements – ranging from technical features and operational functionalities to data editing - were assessed and then transferred to the model developers. On the basis of the collected user requirements, the model´s real-world applicability and serviceability was tested in phase 2. This was organised in a two-step approach:

1) The stakeholders from participating cities and companies were invited to a preparatory meeting, which aimed at organising and prioritising topics (graphical user interface (GUI), use cases, model capabilities etc.) that should be addressed during the two test phases. Based on this initial feedback the test phases were planned and a first draft of the model's GUI was designed in close cooperation with the developers.

2) For each of the two test phases, the participating stakeholders took part in a two-day on-site training, in which the model´s current state of development was introduced with practical use-cases. After these two days, participants were given tasks covering different features of the model's applications, which they should test in the following two months.

Based on their experiences the participants were asked to provide feedback using multiple techniques, namely standardised feedback-forms, direct user dialogs, feedback reports and a final workshop with all partners from science and practice. The results show that the users from urban planning practice already appreciate the current model's concept and functionality. Further development, however, is necessary to provide the practitioners a tool that is applicable in their daily work. The main suggestions ranged from simplified import from input data and a more flexible GUI to guidelines and tools for result interpretation. These findings were made available to the model developers in the form of an evaluation report in phase 3. It is expected the results of the evaluation will encourage the partners from science to further develop PALM-4Us practicability in the second funding phase (starting in fall 2019).

VI. LIRA-GR/2019 Project: Theory of change to integrate sanitation and hygiene on groundwater security on the Cities of Cotonou and Lomé

Henri Sourou Totin Vodounon[1], Koko Zébéto Houedakor[2], Clarisse Sidonie Hedible[3], Komlan Avougla[4]

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In the coastal cities of Cotonou (Benin) and Lomé (Togo), urban communities-based are victim to their own ongoing sanitation and hygiene behaviours resulting in degradation of groundwater quality. This project aims to develop socio-ecological systems to restore and protect groundwater quality through changes in sanitation and hygiene behaviours in Cotonou and Lomé. Theory of change is used to frame process of the project as it enables to work collaboratively and make a comprehensive description and illustration of how and why a change on sanitation and hygiene knowledge, attitude and practice (KAP) is expected to happen in Cotonou and Lomé to sustain groundwater better quality and its accessibility. The project is based on the theory that safe groundwater will not be accessible on the coastal cities of Cotonou and Lomé in the condition of poor sanitation and inappropriate hygiene practices. But socio-ecological mechanisms of sanitation management and hygiene promotion can reduce groundwater pollution. Groundwater quality improvement through a new transversal vision and participatory approach of solid/liquid waste and excreta management can ensure people's health, reduce poverty and exclusion and guarantee food security. Involving urban people, households, communities, city governors, business interest groups, academics and other key stakeholders in this transdisciplinary research project can help to achieve this goal.

Our theory of change will be articulated using a collaborative model in the way of transdisciplinary research. Collaboration between academic and non-academics experts will help to co-design, co-create and co-produce pathways of change on sanitation, hygiene and groundwater management on the cities of Cotonou and Lomé. Long-

term changes that need to happen in the target citizen's lives are revision of sanitation and hygiene behaviours to reduce groundwater pollution and guarantee access to safe water for sustainable well-being of the urban people. To achieve this long-term outcome, changes need to happen at the level of: i) urban community (solid/liquid wastes including excreta management knowledge, attitude, practice), ii) policy (integration of the sustainable development agenda on the local development plans), iii) system (removal sanitation disposal which facilitate pollutant contact with groundwater and contamination). So actions to be taken are collaborative household survey, observational visits, groundwater quality analysis (physicochemical and bacteriological parameters), mapping spatial distribution of groundwater quality and current modes of waste and excreta management modes to help urban population be more conscious about their critical behaviours. Immersion of the urban people on their own environment and management behaviours affecting groundwater quality will have effect to reinforce their psychosocial perceptions enabling to change necessary to guarantee access to sustainable water. Also, health checks will lead to understand the impacts of bad groundwater quality on the urban communities and ecosystems, to assess health risks and define control strategies plan.

These actions can provide to the key stakeholders and actors (urban people, households members, business interest groups, cities governors, policy makers…) experiences as different, change on sanitation and hygiene knowledge, attitude and practice and its effect on groundwater quality and local development on the cities of Cotonou and Lomé from the short to a long time. Citizen views on sanitation, hygiene and groundwater quality and management will change based on understanding current urban ecology, urban metabolism, its sanitation, social and economic implications and how it will be in the future for these coastal cities sustainability. As impacts, application of theory of change will lead citizens and households having capacities on solid/liquid waste management to avoid groundwater contamination and on integrated approach of sanitation and hygiene, academics having capacities on transdisciplinary approach for urban studies.

Key readings:

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2. Hansson S. and Polk M., 2018. Assessing the impact of transdisciplinary research: The usefulness of relevance, credibility, and legitimacy for understanding the link between process and impact. *Research Evaluation*, 27(2), 2018, 132–144. doi: 10.1093/reseval/rvy004
3. Mauser W., Klepper G., Rice M., Schmalzbauer S.B., Hackmann H., Leemans R. and Moore H., 2013. Transdisciplinary global change research: the co-creation of knowledge for sustainability. *Current Opinion in Environmental Sustainability*, 5:420–431

VII. The Knowledge Integration Questionnaire (KIQ): Development and validation of a measure for assessing analytical skills in inter- and transdisciplinary work

Olga Skrebec[1,2], Marcel Hunecke[1,2]
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Introduction

Knowledge integration in inter- and transdisciplinary projects plays a major role for knowledge production in sustainability research. Whereas previous work has primarily focused on design methods of how to achieve knowledge integration in inter- and transdisciplinary processes, little attention has been given on individual knowledge integration. However, first theoretical frameworks and empirical studies examine knowledge integration as individual competence. The aim of our study is the development and validation of a questionnaire for assessing individual knowledge integration (KIQ) in inter- and transdisciplinary contexts.

Method

Based on theoretical assumptions we conduct a pretest of five subscales with overall 93 items to measure individual knowledge integration. The resulting questionnaire will be validated on 450 participants with varying expertise in inter- and/or transdisciplinary work. We expect convergent validity to measurements of perspective taking, reflexivity and ambiguity tolerance and discriminant validity to team orientation.

Results

Pretest outcomes confirm a five-factor structure of the questionnaire. Three factors measure the ability to combine, link and restructure knowledge from heterogeneous sources. Two factors capture the ability to transfer bodies of knowledge from one context to another.

Discussion

Inter- and transdisciplinary education is necessary for solving complex environmental problems. The development of KIQ is a first step towards the goal-oriented detection and education of analytical skills for effective inter- and transdisciplinary work.

Key Readings

Fam, D., Neuhauser, L., & Gibbs, P. (2018). *Transdisciplinary theory, practice and education*. Springer International Publishing AG.

Repko, A. F. (2008). *Interdisciplinary research: Process and theory*. Los Angeles, CA: Sage Publications.

Stokols, D. (2014). Training the next generation of transdisciplinarians. In O'Rourke, M.O., Crowley, S., Eigenbrode, S.D., Wulfhorst, J.D. (Eds.), *Enhancing communication & collaboration in interdisciplinary research* (pp. 56-81). Los Angeles, CA: Sage Publications.

PARALLEL SESSIONS V

INSTITUTIONALISING TRANSDISCIPLINARITY (COMPOSED SESSION)

Thursday, 12.09.2019, 15h50 – 17h30
[Wallenbergsalen]

I. Presentation:

Towards sustainable development of the Caucasus mountain region: integrating transdisciplinary teaching and research into the practice of universities in Armenia and Georgia

Tamara Mitrofanenko[1], Andreas Muhar[1], Tigran Keryan[1,2], Lela Khartishvili[1,3]

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Keywords: Caucasus, rural mountainous regions, transdisciplinary teaching and research, sustainable tourism

Sustainable development of rural mountain regions comprises a challenging task: while exceptionally rich in biological, landscape and cultural diversity, they often face marginalization and provide limited economic opportunities to the local residents. The Caucasus constitutes one example of such a mountainous region, where development prospects are further complicated by the recent and current political and social processes. Addressing complex challenges of the Caucasus mountain communities calls for social learning, informed participatory decision-making and co-creation of solutions with the local population. While ownership and motivation by the local actors is a key factor, additional expert knowledge and skills (i.e. fundraising) are often needed. Moreover, results of short-term interventions often prove to be short-lived.

Involvement of the Caucasus universities in tackling these challenges through transdisciplinary research and teaching could provide a way towards long-term engagement and participatory problem solving with the local communities. However, academic institutions in the Caucasus countries have little experience with transdisciplinary approaches, and until recently there have been few attempts of applying them in the region.

The project Transdisciplinarity for Sustainable Tourism Development in the Caucasus Region (CaucaSusT) focuses on integrating transdisciplinary approaches into the practice of universities in Armenia and Georgia, in cooperation among Armenian, Austrian and Georgian universities, and with inputs from the stakeholders in the participating communities. The partners jointly developed a transdisciplinary case study course, integrated it into the curriculum of the Caucasus university partners (Armenian State Pedagogical University and Tbilisi State University), and implemented it for two consecutive years. The course theme - sustainable tourism development – has been selected jointly by the partners based on the strategic economic development priorities of Armenia and Georgia. The course has been implemented in two different communities in each country, in order for the teaching teams and coordinators to gain experience in working with various stakeholders and in different settings. Communities have been selected based on the status of tourism development and on the interest of the local actors to participate. All stages of the project have been accompanied by evaluations and feedback provided by university and non-academic partners.

The results of the process to-date will be presented, with a focus on sharing methodological insights, including:

- individual and organisational learning - integration of the courses into university curricula, facilitating teachers' competence development,
- addressing institutional, intercultural and disciplinary barriers during the transdisciplinary course elaboration and implementation in the context of local traditions and governance arrangements,
- engaging a pedagogical university as one of the partners – opportunities and challenges,
- facilitating real – life societal transformation through a course on the local level,
- nurturing individual motivations to support long-term processes.

The project outcomes to-date demonstrate that integration of transdisciplinary approaches into teaching and research in Armenian and Georgian universities is possible, given the interest and motivation of university staff and administration. Teachers and students can contribute to addressing real-life challenges of the local communities, and the latter welcome collaboration. Interdisciplinary and transdisciplinary courses offer new insights and practices to the students, motivating them not only to learn, but also to make contributions towards solving societal problems. Moreover, there is potential for longer-term collaboration between universities and non-academic actors.

However, financial and administrative issues can pose barriers, and high interest from the university partners is necessary in order to pursue transdisciplinary research and teaching independently. Further engagement in international partnerships (through joint projects as well as staff and student mobility), can build up interest and capacity for engaging in societal problem-solving among the Caucasus teachers and scientists, particularly the early-career staff.

II. Presentation (short):

Towards Implementing Transdisciplinarity in Post-Soviet Academic Systems: An Investigation of the Societal Role of Universities in Armenia

Tigran Keryan[1,2], Andreas Muhar[1], Tamara Mitrofanenko[1], Verena Radinger-Peer[1], Christian Pohl[3], Ashot Khoyetsyan[2]

[1]University of Natural Resources and Life Sciences, Vienna, Austria (BOKU); [2]Armenian State Pedagogical University, Yerevan, Armenia; [3]Swiss Institute of Technology ETH Zurich, Switzerland

Post-soviet countries today face many challenges regarding the transformation of their education and research institutions. Particularly, the lack of cooperation among disciplines as well as weak cooperation between academic and non-academic actors challenge the ability of universities to address complex issues. Integrating transdisciplinary approaches could help universities in post-Soviet countries play a stronger role in societal problem-solving. Today, there are hardly any references to the implementation of transdisciplinary approaches in post-Soviet academic systems. A proper integration of such approaches requires not only the application of Western experience, which alone can cause disorientation, but also the consideration of local necessities.

We argue that, among other factors, the understanding of the societal role of universities affects the implementation of transdisciplinarity in the academic system. The proposed presentation discusses the main factors that affect various stakeholder group's understanding of the societal role of Armenian universities.

Our research was conducted within the framework of the project, Transdisciplinarity for Sustainable Tourism Development in the Caucasus Region (CaucaSusT), funded by the Austrian Partnership Programme in Higher Education and Research for Development (APPEAR).

The methodology was based on the analysis of legal documents along with qualitative research, specifically focus group discussions, in-depth and expert interviews with university teachers, students, experts and local community members.

The study identifies six dimensions, which reflect the understanding of the societal role of Armenian universities: Perception of responsibility; Perception of the value system; Trust and perception of competence; Understanding the societal relevance of research and teaching; Culture of communication and cooperation between academia and society; Perceptions of motivation towards teaching and learning by the teachers and students.

In conclusion, we found that:

- TD is a new concept in Armenia and could promote collaboration between academia and society, thereby engaging universities in addressing societal problems.
- There are no legal obstacles for implementing TD approaches in Armenian universities.
- Armenian society is ready and open for collaboration, but it is expected that the initiative should come from academia.
- Enthusiastic and motivated teachers, mostly of younger generations, who are open to innovation and implementation of the new teaching and research methods could become key agents for integration of the TD concept into the Armenian academic system.

In general, implementation of TD approaches in the academic system of Armenia could bolster universities' engagement with societal issues like sustainable community development. This will facilitate stakeholders' participation in the co-creation of knowledge and solutions. Integrating transdisciplinary approaches could also improve the quality of university education and research and strengthen the societal role of the universities.

Due to the fact that most post-Soviet countries passed through the same transition processes and nowadays face similar problems, we believe that our results could be representative of other Post-Soviet academic systems as well.

III. Presentation:
Building and Supporting Transdisciplinary Arts Collaborations: On Campus and Beyond

<u>Stephanie Vasko</u>
Michigan State University

Keywords: Arts collaboration, interdisciplinarity, community engagement

As an interdisciplinary center housed in the College of Arts & Letters, the Michigan State University Center for Interdisciplinarity (C4I) strives to bring the arts and humanities into inter- and transdisciplinary collaborations in meaningful ways. We also seek to support artists and humanists in their inter- and transdisciplinary research and to build partnerships and programming that impacts nearby communities, including East Lansing (where campus is located), the capital city of Lansing, the greater mid-Michigan area, and Detroit. In this talk, I'll describe the various methods C4I uses to engage with our local arts communities and build bridges across locations and disciplines. To ensure our ability to accomplish these objectives, we have taken a targeted approach that involves (a) staffing, (b) programming, and (c) educational offerings. I will offer concrete examples of each how we enact this approach and provide the listener with best practices for each of these areas.

Having practicing transdisciplinary artists on staff both helps us to build collaborations and partnerships and broadens our research portfolio. While I serve as the Managing Director for C4I and am formally trained as a chemist, I am also a practicing artist (ceramics and metalworking) who works out of community spaces. Within the Lansing community, I have developed relationships with other local artists and with venues in Lansing. My relationship with the Arts Council of Greater Lansing (ACGL) led to a partnership with ACGL as a community partner for C4I's Transdisciplinary Graduate Fellows Program (TGFP, described below). I also bring a legislative perspective to the arts to C4I through serving on the Mayor's Arts and Culture Commission in Lansing. We have also hired transdisciplinary postdocs, including one who is trained as a sustainability social scientist and artist and whose work at C4I focuses on social creativity and the intersection of art and science. This postdoc and I hold partial appointments in AgBioResearch and create transdisciplinary arts opportunities that bridge the arts and agriculture. We also both pursue transdisciplinary research projects involving the arts that live under the C4I umbrella.

C4I offers on and off-campus programming involving artists and humanists. We host a bi-weekly colloquium open to all artists and humanists engaged in collaborative interdisciplinary research are invited to present their work to the public. In Summer 2019, we launched a monthly seminar series which pairs a C4I researcher and at least one community artist in dialogue about practice and praxis. We also offer and partner with other units to offer workshops on interdisciplinary/transdisciplinary collaboration and teaching.

In terms of educational offerings, we began a Transdisciplinary Graduate Fellows Program in 2019 where two teams of three students worked with community partners to explore real-world issues and created deliverables for their own careers and for their partners. I'll report on the experience of our team who partnered with the ACGL on arts participation and economic development in the greater Lansing area and comment on our future plans for partnering with the arts in educational efforts.

I will close by offering a list of best practices for those wishing to engage in building transdisciplinary arts collaborations on and off campus.

IV. Presentation (short):
How does the Global Land Programme foster transformative science through knowledge co-production?

<u>Isabelle Providoli</u>[1], Albrecht Ehrensperger[1], Jean-Christophe Castella[2], Narcisa Pricope[3]
[1]Centre for Development and Environment; [2]IRD, UMR GRED - UPVM/IRD, Montpellier, France; [3]Earth and Ocean Sciences Department, University of North Carolina Wilmington, USA

Keywords: Co-production of knowledge, land systems, global research network, global land programme

There is growing recognition - in the land system science and land governance communities - that the implementation of the UN Sustainable Development Goals (SDGs) may ultimately translate into competing claims on scarce land resources. Therefore, science-policy-society interfaces are needed to co-design and co-produce innovative approaches to foster synergies and to navigate trade-offs, and thus to achieve the 2030 Agenda. But is land system science in a position to avail knowledge that is usable in the context of such interfaces, relevant for sustainability transformation, and aligned with societal knowledge needs?

The Global Land Programme (GLP - https://glp.earth/) addresses this question by developing, testing, and launching new network infrastructures, science-policy interfaces, and co-production approaches. GLP is a Global Research Programme of the Future Earth research platform and an international network of more than 2000 land system

scientists. In 2018, it launched a working group composed of scientists focusing on the sustainable co-production of land systems with the aim of reaching out to the GLP community and exchanging on trans-disciplinary research methods, approaches, and experiences.

A key activity of the working group has been the organisation of a series of five webinars, dur-ing which key elements of co-production research were presented, discussed, and finally brought together in a synthesis document that provides a road map for co-design and co-production in land system science. Based on a coherent change theory, this roadmap allows GLP scientists to align their work with and find entry points into co-production approaches.

This presentation summarises the entire co-production synthesis process, which took place between June 2018 and May 2019, and elaborate on how land system science can find better ways into societal processes to support practitioners. The audience will take home key mes-sages on the setting-up and shaping of a co-production process aimed at enhancing the transformative leverage of land system science, but which are generalizable to other meta-disciplines.

V. Presentation:

Transdisciplinarity & SDGs: which Strategies for Academic Institutions Working on Cities?

Giulia Sonetti[1], Olivia Bina[2], Marta Varanda[3], Carlo Sessa[4], Igor Campillo[5], Giulio Verdini[6], Josefine Fokdal[7], Katrin Padaam[8]

[1]Politecnico di Torino; [2]ICS - Lisboa; [3]ISEG - Lisboa; [4]INNOVA; [5]EUSKAMPUS; [6]Westminster University; [7]Stuttgart University; [8]Tallin University

Keywords: Education for sustainable development, Academic Organizational Change, Transformative learning, Collaboration

Contemporary urban challenges are characterised by increasing complexity and uncertainty, requiring for new forms of inter- and transdisciplinary urban research. The academia tried to take this opportunity to turn the collaboration among different technological and scientific fields into something more systematic and that is integrating humanities at large. The SDGs logic and the EU calls are examples of this need, but still an effective integration among people and disciplines is difficult to define and thus to achieve.

Collaborative multi-stakeholder processes, especially when focused on wicked problems, face a number of key challenges. There is often contestation between different forms of knowledge, and thus different voices. This is often due to a lack of understanding, appreciation of and learning about the relevance and validity of different knowledge claims, approaches and definitions. To identify the synergies and differences in the current landscape of inter/trans-disciplinary (ITD) research and education methodologies and tools in academic institutions working on urban challenges, this paper performs a review leveraging on the results of several multi-stakeholder workshops and seminars inside the framework of the INTREPID cost action four years work. A review of ITD skills needed for researchers at the individual scale, with influencing factors and value-behavior links, are presented in the light of emerging values, tradition and spiritual perspectives that can be offered by new learning structures and methods. In the second part, the paper enlarges the picture to trace which steps at organizational level academic institutions are being undertaken worldwide to merge different disciplines and departments, to re-shape the role of University in a complex and changing educational supply and demand panorama.

EVALUATION - DIFFERENT PERSPECTIVES (COMPOSED SESSION)

Thursday, 12.09.2019, 15h50 – 17h30
[Europa]

I. Presentation:

Evaluative and enabling infrastructures: Supporting the ability of urban co-production processes to contribute to societal change

David Simon[1], Henrietta Palmer[1], Merritt Polk[2]

[1]Chalmers University of Technology; [2]Gothenburg University

Keywords: Co-production, learning-spaces, organisational transformation, formality vs informality of practices

As widely attested in the literature, the evaluation of co-production is complex and unsuited to the use of conventional quality, monitoring and evaluation indicators. This reflects the uncertainties, co-contributory factors and time lags involved, particularly when seeking to assess institutional and wider societal effects of multi-stakeholder participatory processes and deliberative fora. The most widely assessed effects include the immediate or

direct outcomes of a project or activity (so-called first order effects) while wider societal or third order impacts continue to be the most difficult to capture and consequently, the least well studied. Because of this difficulty, the intermediate, second order, effects of organisational transformation and policy implementation constitute a growing challenge for evaluation. This is our focus here. After 10 years of transdisciplinary co-productive research practice, Mistra Urban Futures, as an interstitial research space bridging academia and practice, has reached a phase where some of these effects are becoming distinguishable. However, they remain patchy and uneven. Accordingly, we discuss the prerequisites for co-production practitioners to engage their respective organisations in transitional and incremental experimentation in order to achieve relevant institutional changes. This requires enabling infrastructures that support training, facilitation and the creation of 'safe' spaces to promote trust and legitimacy. These are needed to underpin the long-lasting personal and organisational commitments which are crucial to achieve transformative organisational effects.

II. Presentation:
What do review panels do when they take funding decisions about transdisciplinary research?

Antonietta Di Giulio, Rico Defila
University of Basel, Switzerland

The paper will present results from the project "Civil society and research for sustainable development: demanding and fostering transdisciplinarity" (ZiFoNE). The project is the accompanying research project to the funding program "Research for sustainable development" (WfNE) in the "Vorab, Lower Saxony", managed by the Volkswagen Foundation. The project is funded by the Ministry of Science and Culture of Lower Saxony. The project leaders are Rico Defila, Antonietta Di Giulio, and Claudia Binder (EPPFL Lausanne, Switzerland). The project investigates three questions, one of them is devoted to the appropriate evaluation of transdisciplinary research. The results that will be presented focus on this research question.

In this research program, we had the opportunity of observing the discussions and funding decisions by an interdisciplinary review panel for three periods of funding. The review panel had, in a first step, to decide which of the consortia that had submitted a project proposal should be invited to present their projects. These presentations and the questioning by the review panel took place in public. In a second step, and after the presentations, the panel decided which projects would get funding. In its funding decisions, the panel had to consider the transdisciplinary quality of the projects as well as their potential contributions to sustainability. The criteria the panel applied had been collaboratively developed by the funding agency and the review panel (we accompanied this process). The majority of the members of the review panel remained in the panel for four years. We observed, tape recorded and transcribed the entire discussions of the review panel.

Taking funding decisions in such a panel is a collaborative act of decision-making. This act requires mutual understanding and learning, it requires developing a common understanding of both the criteria used to assess the project proposals and of how these criteria should be weighted, and it requires building trust in the other members of the panel. The analysis of such a process can focus on the social process and the (interdisciplinary) group dynamics, that is, on how the individuals interact and organise their collaboration. We pursue another approach: We perceive the collaborative decision-making by the review panel as a collaborative speech act, that is, as an act that is enacted by speech. This allows us to focus on the cognitive structure of the deliberations.

In the paper, we will present the results of our data analysis. In analysing the data, we adopt a linguistic approach (interactional linguistics), a novel approach in this field of research, that is, we analyse the speech acts that are performed by the reviewers, how these acts interact and build upon each other, and how they lead to the final decisions by the panel. In the discussion, we will draw conclusion with a view to assessing and funding transdisciplinary research for societal transformation.

III. Presentation (short):

Uncovering the perspective of participants of a transdisciplinary dialogue – The case of Tertúlias do Montado, Alentejo, Portugal

Mª Helena Guimarães[1], Christian Pohl[2]

[1]Institute of Mediterranean Agricultural and Environmental Sciences (ICAAM) Évora University; [2]Transdisciplinarity Lab USYS TdLab, Department of Environmental Systems Science, ETH Zurich

Understanding the perspectives about transdisciplinarity of the participants of such processes is not a common field of study. Most of the literature focus on the evaluation of a transdisciplinary project by external evaluators either at the stages of applying for funding or at the stage of understanding the project impact. The present study is related to both evaluation efforts but the focus is distinct. Our goal is to attain the perspectives of the participants of a transdisciplinary dialogue about the process itself. Therefore, participants are asked to undertake an evaluation of what they have experience. The evaluation is done in the form of a questionnaire built taking into consideration the dedicated literature and adapting it to the needs of the present study. The questionnaire was developed by telephone and assisted by an interviewer that recorded the replies attained. The case study focus on a transdisciplinary dialogued, named Tertúlias do Montado: http://tertuliasdomontado.blogspot.com/. This case study is not a transdisciplinary research project but an ongoing dialogue between researchers and other societal members around a common problem of interest. The Tertúlias do Montado started in 2016 and after 3 years of initiative it is important to understand how the process is understood by those that are participating on it. The questionnaire will be applied in April 2019 to the full range of 153 participants in the 18 sessions that occurred so far. This implies that the questionnaire will be reply by frequent participants and also by those that so far participated only once and in different years. One top of this data, we statistically explore the outcomes of 250 evaluation questionnaires attained at the end of each session.

IV. Presentation:

Transforming complex policy evaluation through co-production: innovating for change

Amy Louise Proctor[1], Adam Hejnowicz[2], Frances Rowe[1], Jeremy Phillipson[1]

[1]Newcastle University; [2]University of York

Policies designed to intervene across water, energy, food and environment sectors are not only intervening in a complex system but are themselves also highly complex and part of a wider complex policy landscape. This poses great difficulties for evaluating the effectiveness, impacts and successes of policies, because both the systems and the policies are constantly open to change and are changing. Very often they comprise multiple interacting elements operating across-scales in a highly dynamic way with multiple feedbacks and non-linear behaviours. This dynamism together with the capacity for newly emergent properties to arise overtime means that the influence of polices is often highly contingent and uncertain, and so their impacts and outcomes can often be unpredictable. So how might you transform the practice of policy evaluation to make it fit for a complex world? Drawing upon a suite of UK policy case studies from across the water-energy-food-environment nexus, we report on work conducted by the Centre for the Evaluation of Complexity Across the Nexus (CECAN) which implemented a transdisciplinary mode of working between academics, policy-makers and evaluation practitioners in order to foster a new praxis designed to lead towards more complexity appropriate evaluation approaches. This paper reflects on the processes of co-production that underpinned this work including capacity building and expertise exchange. Co-production is complex and non-linear and requires all parties to adjust to different ways of working including navigating organisational cultures and boundaries. The research highlights how this social innovation was essential for driving the methodological innovation in evaluation approaches and methods.

FUNDING TRANSDISCIPLINARY RESEARCH - INNOVATIVE APPROACHES

Thursday, 12.09.2019, 15h50 – 17h30

[Antarktis]

Organiser(s): Tobias Buser[1], Flurina Schneider[2]

[1]Network for Transdisciplinary Research (td-net), [2]Centre for Development and Environment, University of Bern

Keywords: research funding, transdisciplinary research programmes, ten stages in TDR programmes

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Science Policy Organisations:

International Science Council ISC, Vivi Stavrou and Katsia Paulavets

Organisation for Economic Cooperation and Development OECD, Carthage Smith

Abstract

Societal issues such as poverty, water scarcity, and food insecurity make it more important than ever for science to produce knowledge that is relevant to address serious challenges on the ground. A growing number of research funding programmes emphasize the need for transdisciplinary (TD) coproduction of knowledge as one way of making research part of needed societal transformations.

TD research requires conditions that differ from those needed for basic disciplinary research. For example, implementation of TD research requires time, skills, and resources for collaborating with other disciplines and societal actors throughout the research process. This process must include efforts towards joint problem framing, exploration of goals and pathways to societal transformations, and co-production and communication of knowledge with and to non-scientific actors. In addition, evaluation of the quality and impact of TD research demands criteria that do justice to the TD character of the project.

In this session we address the question how TD research can best be enabled and fostered through adequate funding schemes. Leading funders highlight and discuss their approaches and experiences in funding TD research.

To structure the contributions and enable learning across different funding schemes and organisations, we employ the ten key stages developed in the article of Schneider, Buser et al. 2019 "Research funding programmes aiming for societal transformations: ten key stages".

The aim is to bring together successful and promising approaches addressing the key stages of TD funding programmes in order to contribute to and exchange on good practices for TD funding.

Session design:

- Introduction 10 key stages for Research funding programmes aiming for societal transformations
- Funders briefly presenting innovative approaches in their funding scheme(s), addressing specific stages
- Discussing promising approaches, integrating examples from the audience
- Discussion on gaps and challenges
- Outlook, potential next steps to advance funding for transdisciplinary research

Key readings

Schneider, F, Buser, T., Keller, R., Tribaldos, T., and Rist, S. (2019): **Research funding programmes aiming for societal transformations: ten key stages**. *Science and Public Policy*. https://doi.org/10.1093/scipol/scy074 (open access)

Short blog-version: https://i2insights.org/2019/06/18/funding-transformative-research/

METHODOLOGICAL DEVELOPMENTS TO FOSTER TRANSFORMATION
(COMPOSED SESSION)
Thursday, 12.09.2019, 15h50 – 17h30
[Sydamerika]

I. Presentation:

More than generalisation of knowledge and creating outputs – Recommendations for promoting transfer of results to new contexts

Emilia Nagy[1], Anna Ransiek[1], <u>Martina Schäfer</u>[1], Alexandra Lux[2], Matthias Bergmann[2], Thomas Jahn[2], Oskar Marg[2], Lena Theiler[2]

[1]ZTG – Centre for Technology and Society, TU Berlin, Germany; [2]ISOE – Institute for Social-Ecological Research – Frankfurt am Main, Germany

Keywords: comprehensive model of transfer in transdisciplinary research, knowledge transfer between contexts, transfer as societal reciprocal process, requirements to enable transfer to new contexts

The aim of transdisciplinary research is to produce knowledge to cope with real-world problems and contribute to the *sustainable transformation* of society (Jahn et al. 2012, Lang et al. 2012; Thomson-Klein et al., 2001; Scholz et al. 2006, Walter et al., 2007; Pohl and Hirsch-Hadorn, 2007, Carew and Wickson 2010, 2014; Polk 2015). This normative transformative objective extends beyond the context of a single transdisciplinary research project. Real-world problems are constituted by the context which they are embedded in. At the same time, real-world-problems are related to bigger societal and sustainability challenges, whose occurrence is not restricted to one particular context. Transdisciplinary projects therefore need to address two requirements: Firstly, they are supposed to provide options for problem solving that have a close fit to specific context conditions; secondly, they should provide knowledge for dealing with similar problems in other contexts (Krohn 2008). Therefore, transferability is an important goal of transdisciplinary research. However, transferability into new contexts is being treated almost only in the notion of scientific generalization of knowledge. Within this understanding of transferability, social aspects like the interaction between contexts as well as the role of new contexts so far have gained little attention.

This presentation is based on qualitative research, which was carried out within the project "*TransImpact* – impactful Transdisciplinary Research". The central question of *TransImpact* was: Are there particular practices and methods that generate a high degree of effects for society and science in a transdisciplinary research project? The main focus of the particular sub-research underlying this presentation was on conditions that potentially enable and promote transfer of knowledge/results from one context to another. Based on the analysis of four transdisciplinary projects, our research focused on what td projects are already doing and what methods they apply to enable transfer of knowledge and results to other contexts. Which experiences have they gained and where are possibilities for further methodological development?

It could be observed that transfer is a complex reciprocal process, in which different types of knowledge have to be provided as outputs and mediated to new contexts, where the knowledge is being enriched, adopted and modified. For successful transfer and appropriation, the actors in the adapting context also bear responsibility. Generating transfer potentials within the duration of the original project highly depends on the ability to be aware of those new contexts. To address the different interdepend aspects of transferability (results, mediation, and adaptation in new contexts), we will present our comprehensive model of transfer in transdisciplinary research. We also discuss overarching requirements, which could support other projects in building up transfer potentials in a more targeted way.

II. Presentation:

Societal transformation through grassroots innovation. The diffusion of sustainability knowledges and practices through transdisciplinary research

<u>Willington Ortiz</u>[1,2], Ulli Vilsmaier[2]

[1]Wuppertal Institute; [2]Leuphana University Lüneburg

Keywords: sustainability transitions, grassroots initiatives, transformative research, transdisciplinarity

The question, how to effectively implement sustainability is one of the central questions of the sustainability sciences. This question becomes a strongly controversial issue when reframed as a demand for research modes that "actively advance the [societal] transformation" (WBGU 2011). Because adding a transformative aim to the – conventionally exclusive – epistemic purpose of scientific research reopens or reinforces enduring controversies like

the 'value-free' of science or its societal role. But, how can that transformative aim be advanced through research? In its flagship report "World in Transition: A Social Contract for Sustainability" the German Advisory Council on Global Change points at innovation development and diffusion: "Transformative research supports transformation processes in practical terms through the development of solutions and technical as well as social innovations, including economic and social diffusion processes and the possibility of their acceleration" (ibid). In deed, the interest in innovation and innovation research has increased in the light of the debates on sustainability and its implementation in recent decades. Of particular relevance for the research presented here are conceptualizations of grassroots innovations that focus on novel approaches to advancing sustainability emerging from civil society spaces (Ortiz, Vilsmaier, and Acevedo Osorio 2018). This in turn reopens the debate on the malleability of society and the place where change takes place. Because, if civil society can offer spaces where approaches to concrete sustainability challenges can be formulated, discussed, tried out and disseminated – and in this way provoke societal change – they can and should be considered as important partners for transformative sustainability research.

In the present study we explore how niches of grassroots initiatives advancing sustainability innovations can contribute to the operationalization of transformative research modes in collaboration with scientists. For this aim we depart by describing an analytical perspective to grassroots innovations applying a critical and cultural sensitive approach to transdisciplinarity (Vilsmaier, Brandner, and Engbers 2017). The focus is on the diffusion of sustainability knowledges and practices, and the ways how these are processed, reinterpreted and diffused across different contexts and levels of socio-technical structuration. Conceptualised as transdisciplinary endeavours, the success of niches of grassroots initiatives is linked to the construction and maintenance of spaces in which knowledges that can be effectively applied for advancing the niche's shared sustainability vision can be continuously generated. This in turn requires a conceptual framework that takes account for the differences and the dynamic of cognitive frames, worldviews, perspectives that can operate in settings directed towards diffusion. We develop such a framework by integrating insights from a critical and culturally sensitive transdisciplinary and apply it for analysing two diffusion pathways proposed in the standard literature: replication (the transit of sustainability knowledges and practices among grassroots initiatives) and translation (transits of innovative components of grassroots innovations into mainstream configurations). Based on this conceptual framework we then propose a methodological approach for designing and operationalizing transdisciplinary research processes in which both the epistemic and the transformative aims are met. This sort of transformative research is constituted by grassroots initiatives and scientists; i.e. research that comprises and systematically articulates both (a) academic inquiries about the conditions that support the germination, development and diffusion of grassroots innovations as well as (b) the processing and transit of sustainability knowledges and practices by and across different contexts and levels of socio-technical structuration. We report on two transdisciplinary endeavours in which the proposed methodological approach has been applied and discuss the consequences of embarking on such transformative research processes constituted in collaboration with grassroots initiatives.

Key readings

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Vilsmaier, Ulli, Vera Brandner, and Moritz Engbers. 2017. 'Research In-between: The Constitutive Role of Cultural Differences in Transdisciplinarity'. Transdisciplinary Journal of Engineering & Science 8 (1). doi:10.22545/2017/00093.

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III. Presentation:

Moving feet, thoughts and lives: a learning experience for the collaborative management of Xalapa's cloud forest, Mexico

Loni Hensler[1,2], Juliana Merçon[3], Ulli Vilsmaier[2]

[1]Universidad Nacional Autónoma de México, Mexico; [2]Leuphana University, Lüneburg, Germany; [3]Universidad Veracruzana, Mexico

Since the decree of the Natural Protected Area Archipiélago de Bosque y Selvas de Xalapa in 2015 as a green belt of this middle-size city in Central Eastern Mexico, a citizens network was formed with the intention of being stewards

or custodians of the local cloud forest, the rivers and the linked peasant life forms. These are threatened by the unorganized, destructive and exponential urban growth and the crisis of the locally grown shade coffee. The network is open to plural and horizontal participation of farmers, academics, civil society organizations, artists, professionals and local government actors. In this multiactoral process, many difficulties and obstacles arise for collective action. These challenges are framed within the general sociopolitical panorama of Mexico, the specific context of the natural protected area and the sociopolitical conflicts in the region, including tensions between different actors, their visions, interests and forms of life, the gap between rural and urban forms of life, the lack of mechanisms for political participation, and diverse forms of socioeconomic crisis, violence and corruption. Due to the highly complex context where there are no prefabricated answers, it is crucial to create new forms of social organization and collaboration where an intercultural dialog, the critical analysis of this panorama and participatory practices open space for collaborative learning and collective action towards socioecological transformation.

In a process of transdisciplinary participatory action-research started in 2016, we experienced and systematized different methods of knowledge co-construction and social organization, focusing especially on the relation between learning and transformation, the conditions that favor or hinder the transformational potential, the role that existing power relations play in the learning process and how they can be modified by different practices. Based in an approach of participatory grounded theory, the action-research process formed a spiral between reflection and action, involving facilitating and observing different methods, categorization with participatory elements, dialog with other researchers and theory in order to redefine the collective action and new practices. Triangulation of methods, data sources, and theoretical approaches formed an important strategy to counter-balance the close implication of the researcher. In order to collectively design, implement, register and systematize the methods and results, we ran an outreach course on Participatory Methodologies for a Co-management of our Territory.

In this presentation, key findings from these learning transformative processes will be shared, and the difficulties and opportunities of this approach of university engagement in the promotion of collaborative learning will be discussed. Some of the identified elements for transformative learning are i) the construction of collective visions and dreams for this territory, ii) the exchange between diverse local experiences in learning tours, iii) the inclusion of continuous spaces for collective reflection transforming conflicts and making learning visible, iv) the connection with games, arts, movement and spirituality and v) the diversity of methods responding to the diversity of capacities of the participants and the complexity of learning. Moreover, it has been crucial to recognize the power relations between actors in order to be able to design and maintain methods that allow ample participation in the collective construction of ideas and actions, fostering the transformative potential. Finally, considering that this methodological approach is inspired by Paulo Freire's theory and practice and by decolonial epistemologies from the global south, we highlight the need to incorporate diverse expressions found in different cultural contexts, as well as an open-minded and self-critical transdisciplinary perspective.

IV. Presentation (short):
Evaluating the Integration and Implementation Sciences Framework
Melissa Robson-Williams[1], Bruce Small[2], Roger Robson-Williams[3]
[1]Manaaki Whenua Landcare Research; [2]AgResearch; [3]Plant and Food Research

Research teams internationally are addressing complex social and environmental problems. Such problems are typically messy, confusing and not amenable to technical solutions alone. They also present particular challenges for researchers. Transdisciplinary research is an approach to tackle some of these problems. The Integration and Implementation Science (i2S) framework has been proposed as a way of improving the methodological soundness of transidicplinary research, allowing the approach to deliver more fully on its potential to tackle complex environmental and social problems (Bammer 2013). The framework builds on theoretical developments and extensive research experience, and is structured around three domains: synthesising science and stakeholder knowledge, understanding and managing unknowns, and supporting policy and practice change.

Evidence for the effectiveness of such research approaches is being sought by many, including science funding agencies. An example of this is the mission-led National Science Challenge, 'Our Land and Water' in New Zealand. The Challenge's mission is transforming New Zealand's agricultural sector. The importance of transdisciplinary approaches is acknowledged, however, there is resistance to , and scepticism about the effectiveness of, rethinking research design. The Collaboration Laboratory is a research programme in the National Science Challenge. In this programme, we hypothesised that the greater attention that research paid to the elements of the i2S framework,

the more useful and usable the research outputs would be considered to be by a range of next users. We sought to make our research findings directly relevant to the types of scientists involved in the National Science Challenges. As well as the results of the study itself, how this work has been received provides insights on the difficulties of undertaking both excellent and impactful research.

We examined seven case studies that covered a range of environmental and agricultural problems. Data were collected from workshops with research teams to get descriptions of the case study, and interviews and surveys of next users to get perceptions of usefulness of the research process. All of the workshop and interview data were assessed qualitatively, using thematic analysis, and quantitatively, where data was scored on a scale of 0-4, for the extent of consideration of the i2S framework elements and perceived usefulness, respectively.

A positive correlation of 0.79 was found between the extent to which a case study considered the elements of the i2S framework in each of the domains, and the perceived next user usefulness of the research process and outputs. This relationship was consistent across all three i2S domains, with correlations of 0.84, 0.78 and 0.81 for domains 1, 2 and 3 respectively. All of these correlations are significant at 95% ($p<0.05$).

To understand these correlations in more depth, the quantitative survey and qualitative interview data from the next users was used to identify those aspects where the case studies were perceived to be most useful. The qualitative case study data provided insight into what the case study project teams actually did in relation to the three i2S domains.

The findings suggest that the concepts contained within the i2S framework are important for generating useful and usable research.

Key readings

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DIALOGUE, DISCOURSE, AND ENGAGING DIFFERENT VOICES (COMPOSED SESSION)

Thursday, 12.09.2019, 15h50 – 17h30
[Nordamerika]

I. Presentation:
Contemplating Complexities: Enabling transdisciplinary dialogue in co-production processes.

Johan Larson Lindal[1], Varvara Nikulina[2], Henrik Ny[2]
[1]Royal University of Technology, Stockholm, Sweden; [2]Blekinge Institute of Technology, Karlskrona, Sweden
Keywords: transdisciplinary, complexity, co-production, facilitation

Participatory approaches in urban planning are gaining wider applicability among stakeholders. Transdisciplinary co-production of knowledge is one example of such approaches. However, conducting and managing transdisciplinary processes entails facing a wide range of general and contextual challenges, such as relating to variations in epistemic communities, culture, language (discourse, lingua franca and vernacular), gender, age, pace of life, political and institutional contexts. These challenges require concepts, approaches and methodologies enabling facilitation of efficient processes along the way.

This paper sought initial answers to how we might enable a practical response to the identified challenges of transdisciplinary co-production planning processes.

As a starting point, we began to assess five approaches for theoretical relevance: design thinking, systems thinking, complexity awareness, deliberative theory and behavioural economics. The theoretical insights were tested in the case study of a scenario development process in the Blekinge Region within the Strukturbild Blekinge 2.0 project. More specifically, elements of all five approaches were used to analyse the design process of a transdisciplinary stakeholder project workshop, its implementation and follow up. The assessment results were compiled into a preliminary framework for transdisciplinary dialogue in co-production processes. Findings indicated that elements of each approach were relevant in establishing a framework for transdisciplinary dialogue during different stages of the project workshop.

The authors expect that the findings could have potential benefits for transdisciplinary co-production processes related to urban planning in other parts of Sweden and abroad, as well as in other contexts, such as sectoral and cross-sectoral participatory processes.

This study builds on the previous work resulted in a manuscript "Lost in translation: a framework for analysing complexity of co-production settings in relation to epistemic communities, language and culture" (Nikulina et al, 2019, submitted to a journal).

II. Presentation:
Detecting Integrative Discourse in Team Meetings

Bethany K. Laursen, Michael O'Rourke
Michigan State University

Integrating disciplinary & professional contributions is essential to transdisciplinary teamwork. Many teams succeed while others fail. However, transdisciplinary methods have yet to be developed for observing such success or failure in the making. Our research presents a method for detecting integrative discourse in team meetings using a new form of conversation analysis. We employ argument reconstruction to identify integrative relations between disciplinary contributions.

We highlight two reasons why team researchers find integrative discourse hard to detect. Firstly, we do not know what integration is. Yet recently O'Rourke and colleagues (2016) characterized integration as "an input/output process, where a series of changes to the inputs results in a 'bringing together' or combination of inputs, producing an output" (p.67). This IPO (Input-Process-Output) model of integration emphasizes the importance of *integrative relations* (IRs). Integrative relations include relations such as fusing, linking, assimilation, and transformation. However, the list of IRs is open-ended, and therefore, so is our theory of them. Observing integrative relations in team discourse can help us refine our understanding of IRs.

Secondly, we do not know how integration is achieved in team conversations. Again, recent work provides a step forward. Laursen (2018) proposed that interdisciplinary integration can be observed in how teams reason together. Collaborative reasoning involves building, offering, and evaluating arguments. Like integration, an argument can be understood as an IPO process with the inputs being reasons (premises) and the outputs being claims (conclusions). The process that transforms premises into conclusions is inference. By application, then, when team members make an *integrative* argument, they rely on IRs. Therefore, to detect integration in team talk, we need to observe which IRs team members use in making inferences from reasons to conclusions.

We pursue these observations by using several transcripts from team workshops conducted by the Toolbox Dialogue Initiative (O'Rourke and Crowley 2013). First, we use argument reconstruction to identify claims the participants make (see also Brun et al 2014. Second, we look for integrative relations within these claims. Identifying an IR requires identifying its inputs and outputs (and, if desired, their disciplinary origins) and then identifying the combination used to integrate the inputs into the outputs, which is the IR itself. Third, we arrange the IRs into a taxonomy that can serve as a menu of options for analysts and team members seeking integration.

Open questions from our work include: How can we improve the reproducibility of this method? What aspects of integrative discourse does this method miss? What integrative relations do you see in our transcripts? How would you taxonomize them?

References:

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III. Presentation (short):

Listening to the loud and soft voices of interdisciplinarity to enable societal transformation

Katrine Lindvig[1], Catherine Lyall[2]

[1]The University of Copenhagen; [2]The University of Edinburgh

Paradoxes, according to Granovetter (1973), are "a welcome antidote to theories which explain everything all too neatly". In this presentation, we discuss some of the paradoxes that are evident from our studies of Danish and British attempts to institutionalise interdisciplinarity within existing higher education structures (Lindvig, 2017; Lyall, 2019).

We contrast individual and institutional practices in order to highlight the decoupling that persists between strategic, institutional levels and those engaged in the daily practice of interdisciplinarity, revealing a series of misalignments between rhetoric and reality.

Existing approaches to interdisciplinarity can broadly be divided into categories of integration and of generalisation; of perceiving interdisciplinarity as something that can and should be defined by concrete, set methods and guidelines (Repko, 2017) or as a concept that covers any dialogue between disciplines (Moran, 2010) and thus applied to a broader field of activities.

Another way of understanding the concept of interdisciplinarity is that it has both a loud and performative voice and a quiet and productive voice. Whereas the performative voice is visible in institutional strategies and national (and international) research funding policies, the quiet voice is present at the local and everyday levels, where students and researchers do highly integrated research and educational activities, often without even labelling it 'interdisciplinary'.

So far, these voices of interdisciplinarity have been discussed in separate strands of the literature; partly because of a division of labour between research fields studying interdisciplinary research, collaboration and education, respectively; partly because the approaches address different levels of governance of higher education and research and are motivated by different goals.

Nevertheless, in our studies from two countries with relatively recent explicit interdisciplinary histories, these voices are concurrently present; as two voices, speaking at different sound levels. The loud and strategic voice is heard at the programme and project management levels; the quieter voice is present at the mundane levels, among the faculty, researchers and students, practising interdisciplinarity.

The presentation draws first on empirical data from fieldwork conducted in Denmark from a large interdisciplinary programme at the University of Copenhagen to introduce the concept of soft and loud voices in order to illuminate the challenges of introducing interdisciplinarity within existing monodisciplinary structures. We then test the utility of this concept by demonstrating how these loud and soft voices can also be witnessed through a series of career history interviews with British academics.

By offering a counter-balance to the experiences from countries with a longer history of institutionalised interdisciplinary education and research, we wish to prompt a discussion of the implications of these voices when they are brought into balance, and the impact that this might have on the organization of our institutions, to enable them to better handle the necessary transformations that we seek as a society. In a wider perspective, the aim is to ensure that researchers and students of the future are better equipped with the skills to co-design and lead processes that target sustainable outcomes.

Literature

Granovetter, M. S. (1973). The Strength of Weak Ties. *American Journal of Sociology*, 78(6), 1360–1380.

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Moran, J. (2010). *Interdisciplinarity* (2.). London: Routledge.

Repko, A. (2017). *Interdisciplinary research process and theory*. Los Angeles: SAGE.

IV. Presentation:

Refreshing Transdisciplinary Research: the Challenges of Research with Children in Intercultural Contexts
Frédéric Darbellay, Zoe Moody
University of Geneva
Keywords: Transdisciplinarity, Research with Children, Inteculturality, Children's Rights

Transdisciplinary research has a tradition of integrating in its processes of co-construction and development, not only knowledge produced by scientific disciplines, but also more or less expert knowledge and skills from non-academic actors. The main objective of this type of trans-disciplinary research (trans-, that goes beyond disciplines and transgresses the boundaries between the academic and non-academic worlds) is to build a comprehensive understanding of a given problem and to solve it through exchange and cooperation. While transdisciplinary research has primarily been developed by involving extra-academic actors in the sectors of civil society, the private sector and/or the state, it is important to rethink its dynamics when it opens up to the participation of children in the research process. Is transdisciplinary research involving children as co-researchers similar to that conducted with adults or does it present specificities? If so, can these specificities provide new theoretical paths and methodological innovations capable of producing data and interpretations that can change or transform social practices and the place of children, not only in the dynamics of social change but also in the world of scientific research? This presentation aims to take stock of the progress of transdisciplinary research by positioning children in its realm. The founding concepts of transdisciplinary research, including complexity, integration, co-production, collaboration and problem solving, will be analysed through the lens of the participation principle, core to the field of children's rights interdisciplinary studies.

Without entering a militant approach, but in line with the core principles of the UN Convention on the Rights of the Child (1989), children's needs and capacities for research, curiosity and discovery have to be recognized, without discrimination. The child's best interests and opinion also have to be considered in all decisions or actions that concern him or her. Finally, the implementation of the rights to development and participation should enable children to develop their full potential, while exercising their freedom of thought and expression (the right to be heard) by actively participating in the life of the community, more specifically to the life of scientific research. Transdisciplinary cooperation between scientists and children as co-researchers raises fundamental questions about the institutional, organizational, epistemological, theoretical, methodological and ethical dimensions of research practices. We approach these questions in an intercultural and comparative perspective, by presenting a research project that involves children at different levels of participatory scale. We show how and why a more or less active participation of children in the research process and the co-production of methodological tools, analysis and interpretation schemes is likely to impact more or less sustainably the production of scientific and social knowledge. The project ("Exploring the way to and from school with children: an interdisciplinary approach of children's experience of the third place") experiences directly the issues and methods of transdisciplinary research by involving children in the research process as members of an advisory group to fully co-develop methodological tools with scientists and assist them with data interpretation and production of recommendations for the civil society.

THEORISING TRANSDISCIPLINARITY (COMPOSED SESSION)

Thursday, 12.09.2019, 15h50 – 17h30
[Asien]

I. Presentation:

There is nothing as practical as a good theory – Systemic Organizational Theory, Dialectics and Transdisciplinary Research
Martina Ukowitz
University of Klagenfurt
Keywords: multi-perspective communication, system logics, contradictions, epistemic structure, methodology, research process

Transdisciplinary research is a highly practice oriented approach in a twofold way: It focuses on societal practices and questions related to everyday issues and it has a strong tradition of "not losing the ground of societal realities" and of working outside the "ivory tower of science". At the same time, following the quotation attributed to Kurt Lewin that there is nothing as practi-cal as a good theory, it can be observed that – more than in other fields of research – research-ers, who are practicing transdisciplinary research, are also interested and engaged in methodol-ogy and

questions concerning theoretic backgrounds. The rich discourse on Td methodology and theory is mainly basing on td practice and an ongoing reflection of theory-practice relations. That can be seen as a big strength of the td community.

One question, which is discussed controversially, is about the originality and independence of td research as a theoretic construct or paradigm. It is discussed if it could be justified at all and arguments for doing so are exchanged. To examine that more deeply and to delineate dimen-sions in theorizing td research, a focus on the epistemic structure of td research was recently suggested: Research interest, the constitution of the "objectives" of research, epistemic charac-teristics and methodology come into sight and offer a structure for dealing with theory related questions. On the way towards a (possible) theory of td research apart from reflecting research practice and drawing theoretical conclusions from it, it is interesting to reflect, which points of reference to existing theoretic constructs or discourses could be useful to foster the discourse about a theory of td research. Of course it's not intended and not possible to simply transfer other approaches to td research, it's more about tracing some sort of "family similarities", which can help to better describe the characteristics of td research – also with the view on differences to other approaches of research.

The presentation introduces Systemic Organizational Theory (and Organizational Development) and Dialectics as possible points of reference. Both approaches are addressing the procedural aspects of td research and can help to conceptualize td research as a communicative arrange-ment including researchers and actors from practice with their different perspectives on a cho-sen topic. Especially in the context of the transformative concerns of research the social and (in a broader sense) political aspects concerning stakeholder communication and interaction are crucial for the desired impact. Joining forces for change, the conference theme, on the level of td project work means to organize and to some extent steer social systems. Td research in this sphere of work has to deal with contradiction management and negotiation processes.

After an introduction on motives for theorizing td research and some notes on how the terms organization and communication are conceived in the context of td research, an outline of Sys-temic Organizational Theory/Organizational Development and Dialectics follows. It is pointed out how these two approaches appear in the scientific discourse respectively the research practice, their main characteristics and premises are presented and it will be analysed in which respects they can be fruitful for td research. Specifically interesting aspects are the focus on interaction and multi-perspective communication and on adequate structures and processes for it, the in-sight into social dynamics, the handling of different system logics and contradictions and finally, based on the previously mentioned points, the conception of change as an organizational effort.

II. Presentation:
Towards theorising rich learning cultures of transdisciplinary research

<u>Alice McClure</u>, Gina Ziervogel, Zarina Patel, Joanne Hardman
University of Cape Town

Keywords: learning, emergence, reflexivity, culture, relations

Problems associated with climate change are characterised by complexity, rooted strongly in the uncertainty of climate and social systems, as well as the feedback loops between these two systems. This complexity is exacerbated in cities with high levels of unemployment, informality, poor public service provision and a large infrastructure deficit, such as African cities. New practices that integrate the perspectives and knowledge of decision makers, society and scientists are required to frame climate-related impacts, as well as potential solutions. Transdisciplinary research (TDR) is one such practice; bringing a variety of knowledge holders together with the aim of supporting mutual learning, as well as co-production of knowledge and outputs. How we conceptualise learning influences our ability to understand the efficacy of TDR when responding to such problems. Simple concepts of learning, rooted in binary or deficit models, are often applied to TDR, undermining the understanding of how such processes support new learning cultures and practices based on relationships, productive differences, reflexivity, and innovations.

This research aims to contribute to theorising the learning supported by TDR for managing complex, emergent societal problems. This contribution is based on experience and empirical analysis from the *Future Resilience of African CiTies and Lands* (FRACTAL) case study. FRACTAL has the overarching objective to support co-production of climate-related, usable knowledge in southern African city-regions and has been strongly guided by TDR co-production principles. Learning labs have been implemented in three cities (Lusaka, Maputo and Windhoek), during which decision makers, representatives from society and scientists have collectively framed 'burning issues' that are likely to be exacerbated by climate change. Knowledge on solutions has also been co-produced by all stakeholders

involved, with notable influence on city decision processes. Qualitative research methods combined with social psychology theories provide a new lens through which learning is explored in TDR as an evolutionary, dialectic process between knowledge holders that has the potential to shift working cultures towards new practices that are required to deal with complex problems. Findings from this research are expected to contribute to theoretical and methodological developments within the field of TDR learning.

III. Presentation:

Flattening the Hierarchies of Producing Sustainability Science: A Gender Perspective

Kareem Buyana[1], Jacqueline Walubwa[2]

[1]Makerere University, Uganda; [2]University of Nairobi, Kenya

The production of sustainability science is no longer the preserve of a particular discipline or filed of practice. Academics, whose research has traditionally topped the hierarchy of knowledge production, are increasingly being called upon to work with policy and societal stakeholders as co-producers of knowledge, in what this article refers to as flattening the hierarchies of producing sustainability science. But both academic and non-academic actors have not yet deeply engaged with the question of it means to be 'gendered' when undertaking sustainability research with different disciplines, policy and societal agencies. This question is not marginal because gender issues are not discipline-bounded and do permeate all aspects of sustainable development, including social, economic and environmental sustainability. The article deploys three conceptual domains for grounding the co-production of sustainability science in the discourse on gender equality. First is the notion of 'engendering the co-framing of research agendas', which speaks to the components that link gender with sustainability issues in the definition of the development challenge to be confronted and the guiding research questions. Second is 'engendering the co-design of methodologies', which centers on the analytical grids for integrating gender issues in the a spectrum of approaches and methods for generating, integration and sharing of scientific, policy and societal knowledge on a particular or an interrelated set of sustainability issues. Third is 'engendering co-experimentation', which refers to testing or taking to scale locally-embedded solutions that have the dual ambition of bringing about systemic change in gender relations and addressing sustainability challenges such as extreme poverty and climate change. By bringing to bear the ways of engendering the co-production of sustainability science, the paper sheds light on one of the gaps that can limit the transformative potential of transdciplinary research.

Key readings

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IV. Presentation:

Designing a transformative epistemology of the problematic. A perspective for transdisciplinary sustainability research.

Daniela Peukert, Esther Meyer

Leuphana University of Lueneburg

This paper elaborates on the question, how to design an epistemological foundation for problem-oriented, collaborative forms of research, such as transdisciplinary sustainability research. It picks up approaches of 20th century European philosophy, on the basis of the concept of the problematic, and design research. The problematic is explained as a historical epistemological effort. Design research shows parallels to the epistemological thinking of the problematic by contributing to a differentiation and historicity of knowledge and knowledge production itself. Designing is constituted by a nexus of conceptual thinking and creative making, so are designs as drafts themselves. We develop the epistemological approach of *problematic designing* based on the elaboration of the characteristics of the problematic and design and by relating them to each other. The reason, why we bring together the philosophy

of the problematic and design, lies in the twofold nature of design. On the one hand side, design reveals its strong epistemological force in the process of designing drafts as (manifested) ideas. On the other hand side, designing as a practice and process produces tangible artefacts that are able to visualize and concretize transformations. By bringing together problematic thinking and design, we use the problematic as a philosophical base and interweave it with design to develop an epistemological approach that is able to unfold intended connections to transformative practice and opens up a new perspective in and for transdisciplinary sustainability research. We call this a 'thinking practice of problematic designing', which describes an epistemological tool as well as a transformative process. The following epistemic qualities are attributed to problematic designing: it is tied back to design practices as well as their specific historical, socio-cultural, economic, and political situatedness. Problematic designing is an epistemological process inherent in the living and characterized by being always in the making. As an open structure designing is embedded in reflexive movements and constituted by epistemological breaks in a way that the design results can grow beyond their conditions of production, herein lies their transformative moment. We describe the process of problematic designing in four analytical steps: differentiate, detect, assess, and design. By opening up manifold dimensions of transformation, this epistemological approach is oriented towards complexity, enabling to generate sound and future-relevant knowledge.

Key readings:

Escobar, Arturo. 2018. *Designs for the Pluriverse: Radical Interdependence, Autonomy, and the Making of Worlds.* Duke University Press.

Krohn, Wolfgang, Armin Grunwald, and Martina Ukowitz. 2017. "Transdisziplinäre Forschung revisited. Erkenntnisinteresse, Forschungsgegenstände, Wissensform und Methodologie." *GAIA* 26 (4): 341–347.

Maniglier, Patrice. 2012. "What is a Problematic?" *Radical Philosophy*, 173.

SIDE EVENT

Thursday, 12.09.2019, 15h50 – 17h30
[Foyer/Lobby]

URBAN FORUM PRACTICE MEETS ACADEMIA: FLOOR TALKS (PART I)

Organiser(s): Lisa Diedrich[1], Per-Johan Dahl[2]
[1]SLU Urban Futures; [2]Urban Arena at Lund University

PARALLEL SESSIONS VI

QUALITY OF TRANSDISCIPLINARY RESEARCH PROCESSES FOR FOSTERING TRANSFORMATIONS? MORE THAN EVALUATION CRITERIA!

Friday, 13.09.2019, 08h40 – 10h20
[Wallenbergsalen]

Organiser(s): Alexandra Lux[1], Martina Schäfer[2], Rico Defila[3], Antonietta Di Giulio[3], Christoph Görg[4], Flurina Schneider[5]

[1]ISOE – Institute for Social-Ecological Research, Germany; [2]Center for Technology and Society (Zentrum Technik und Gesellschaft ZTG) at TU Berlin, Germany; [3]Program Man-Society-Environment at University of Basel, Switzerland; [4] Institute of Social Ecology at University of Natural Resources and Life Sciences, Vienna, Austria; [5]Centre for Development and Environment at University of Bern, Switzerland

Keywords: quality criteria, societal relevance, shared responsibility

Transdisciplinarity is a challenging mode of research: it seeks both to address societal problems and to contribute towards possible solutions by means of integrative processes and to add to the body of scientific knowledge. Thus, transdisciplinary research aims at generating effects - in society and in science. For years, this has raised the question of how the quality of transdisciplinary research processes and their results should be described and assessed. Recent debates have shown that the key actor groups in transdisciplinary research approach the quality discourse from different angles: societal actors, researchers and funders emphasize different kinds of quality and thus - often implicitly - apply different criteria or benchmarks in assessing quality. However, the starting point is a shared responsibility for dealing successfully with the ambitious research mode. Usually they share the overall aim to foster transformations for alleviating complex problems - albeit perhaps for different reasons and in different framings. Furthermore, all three actor groups are ambassadors of the process and are responsible to promote the key messages of a project and the usability of its results. But it has to be recognized that the actor groups have different roles in the integrative research process. The debate about quality must therefore take at least these three perspectives into account and bring them together.

We would like to invite ITD participants to join this discussion session. The session's aim is to capture the ambiguity of the quality discourse in transdisciplinary research: There are good reasons why quality criteria for processes and results are needed, good arguments why it is so difficult to define them, and good reasons why the debate should not focus exclusively on criteria.

The key questions for the discussion are:

- How can the different quality requirements of the different actor groups regarding processes result in a shared responsibility for effective research?
- How can self-reflection efforts be combined with an external assessment of high-quality and effective research processes and outputs?
- What are the limitations and risks involved in defining quality under a perspective of shared responsibility in transdisciplinary research?

Session Design

The 90-min session will start with a max. 30 min-input by the organizers containing short statements on their perspectives and perceptions of the quality discourse in transdisciplinary research. Based on this, the participants will develop a common understanding resp. a notion of differences in understandings regarding the three above questions using interactive formats.

HOW CAN SCIENCE POLICIES, UNIVERSITIES AND RESEARCH INSTITUTIONS ENABLE TRANS-DISCIPLINARY RESEARCH TO ADDRESS SOCIETAL CHALLENGES?

Friday, 13.09.2019, 08h40 – 10h20

[Europa]

Organiser(s): **Carthage Smith[1]**, **Jakob Zinsstag[2]**, **Tobias Buser[3]**, **Christine Ahrend[4]**, **Audrey Podann[4]**, **Bianca Vienni[5]**, **Vivi Stavrou[7]**

[1]Organisation for Economic Cooperation and Development OECD; [2]University of Basel; [3]td-net, Swiss Academy of Sciences; [4]Technical University of Berlin; [5]TdLab, ETH Zürich, Switzerland; [6]Leuphana University of Lüneburg, Germany; [7]International Science Council ISC

Transdisciplinary research (TDR), integrating natural and social sciences with input from non-academic societal stakeholders, is considered to be necessary for developing solutions to complex societal challenges, including those identified in the UN Sustainable Development Goals (SDGs). The need for transdisciplinary approaches is beginning to be recognised at the policy level, as many countries organise their science, technology and innovation strategies around societal challenges. One immediate consequence, is that an increasing amount of research funding is being allocated to a variety of missions or grand challenges that require transformational change at multiple scales – from local to global.

Despite substantial advances in conceptual thinking and methodological development in relation to transdisciplinary research, there are significant challenges in scaling it up to the level that is required to fully address major societal challenges. Research funding agencies struggle to identify and support good projects and the research community, as a whole, is not well organised to meet the requirements for transdisciplinarity. There are a number of significant barriers that need to be lowered in order to mainstream TDR. These include issues related to peer review and scientific publications or defining the applicability and benefits/impact of TDR. Most importantly, many of these barriers relate to the institutional environment in which science education, training and research takes place. Traditional, disciplinary-based, academic structures with their well-established incentive and reward systems that focus exclusively on "scientific excellence" (re. high impact, highly cited publications) are not readily conducive to TDR. Early career researchers, in particular, can struggle to establish themselves using methods in which teamwork and communication are as important as individual 'intellectual' skills and for which many of the desired outputs do not easily map into disciplinary reward structures. Policy makers, research funders and research institutions need to work together to lower or remove these barriers.

The OECD Global Science Forum (GSF), which brings together representatives from science ministries, began a project in late 2018 to explore what the policy requirements are for addressing societal challenges using transdisciplinary research. The project, which is overseen by an international Expert Group, aims to carry out a systematic analysis of the theory, methods and practices for transdisciplinary research. Key questions to be addressed include:

1) What are the key characteristics of successful research environments (individuals, teams, institutions, networks) for transdisciplinary research?
2) What institutional arrangements are appropriate for promoting rigorous trans-disciplinary research and what does not work?
3) How can research funding mechanisms and institutional support structures be adapted to promote transdisciplinary research? How can the necessary diversity of perspectives and contributions be valued and rewarded?
4) How can distributed expertise be combined across countries to address societal challenges that have a significant international or global nature?
5) How can universities and other academic institutions educate and train students and young researchers to promote transdisciplinary research, both at individual and group levels?

A number of in-depth case studies are being conducted to try and answer these questions. The selected cases are transdisciplinary projects that address a variety of different topics at different scales. These range from international projects on energy solutions to local projects on sustainable water management. An initial analysis of the outcomes of this work will have been completed by the time of ITD 2019 and will be presented at the start of this session, with a focus on the role of research institutions.

From an institutional perspective, enabling and promoting transdisciplinary research requires significant changes to policies, practices and structures. A number of research institutions are grappling with how to make the necessary transformations. These include the Technical University of Berlin and the Leuphana University of Lüneburg, both of whom will present their experiences in this session.

The bottom up experiences and lessons from research projects will be considered together with the top down lessons from Institutions that are trying to make change, in a round-table discussion. This will focus on what actions are required from science policy makers to support TDR research.

ITD 2019 provides a unique setting for this session in that it brings together many of the key stakeholders and leaders in transdisciplinary research internationally and this is an opportunity to use that collective intelligence to inform an eventual OECD policy report to governments.

Session Design:

The aim is to have an interactive session with a mix of presentations, panel discussion and open discussion with the audience.

1) Presentation of the outcomes of the OECD-GSF case study analysis – "Challenges and potential solutions to implementing TDR approaches". Jakob Zinsstag (15min)
2) Institutionalisation of transdisciplinarity at the Technical University of Berlin. Christine Ahrend, Audry Podann (15min)
3) The case of the Leuphana University of Luneburg. Transdisciplinary institutionalization in higher education: a two–level analysis. Bianca Vienne Baptista (15min)
4) Panel discussion "Building synergies between national and institutional policies, including mandates and incentives, to support TDR". Panellists to include presenters and representatives from OECD-GSF, td-net and ISC (30 min)
5) Open discussion "priorities for policy action to address societal challenges using TDR" (20 min)

Abstracts from research institutions:

Institutionalisation of transdisciplinarity at the Technical University of Berlin

Prof. Dr.-Ing Christine Ahrend, First Vice President for Research, Appointment Strategy, Knowledge & Technology Transfer; Dr. Audrey Podann, Advisor for Strategic Projects

The Technische Universität Berlin (TU) is one of the three major universities in the German capital. Through its history 1933-1945, its goal is to develop knowledge for society and for the benefit of society. The TU has very solid practical experience with transdisciplinary research in many disciplines and subjects. We – together with external partners - make an important contribution to theory building with the Transimpact project (funded by the Federal Ministry of Education and Research) at our Center for Technology and Society (ZTG). We are convinced that we should go this way even more concentrated and with a strategic orientation of the entire university. Grand global challenges need a change in the classical academic mindset.

As one of the first major universities in Germany, we have implemented a transdisciplinary strategy that is actively promoted by the university's executive board. We are constantly searching for ideas, formats and methods for the different disciplines of our university - from the social sciences to the natural sciences. Our aim is to strengthen transdisciplinary cooperations, in order to jointly explore grand global challenges and develop solutions with societal stakeholders.

One focus of our work is the cooperation with the citizens of Berlin. We want to be a partner for Berlin and its various stakeholders to develop a new urban agenda and work in various formats to co-design solutions for the city of tomorrow. Due to its history, Berlin faces a fundamental transformation process and is growing rapidly – while not having the tools, administration and funding to create a sustainable agenda without the support of both academia and its citizens.

Since March 2018, the transdisciplinary project "New Urban Agenda Berlin", a strategic project of the executive board of the TU Berlin, has been running. The project focuses on topics such as mobility, immigration, tourism and housing. In cooperation with the HUMBOLDT-VIADRINA Governance Platform (HVGP) and our own "TRAFO"-development, deliberative dialogues were organized to design transdisciplinary solutions for the challenges of the growing city Berlin.

Within the last year, we had workshops with more than 120 researchers from the TU Berlin. Together with the partner HVGP, more than 1,900 stakeholders in Berlin were identified, contacted, invited and informed. More than 250 participants have signed up for Trialogs so far. For each topic, 3-4 main areas of research were identified at the

TU and topics and project ideas for the transdisciplinary exchange in Trialogs were prepared. After each Trialog approx. 3 ideas were concretized and working groups were formed. The TU team coordinates and supports applications and organizes various workshops to keep the teams working. So far, we already applied for several research programs and get first funding for our co-designed projects.

In our presentation, we would like to report on the opportunities and difficulties of institutionalizing transdisciplinarity at a large technical university and discuss our strategic considerations for a top-down strategy with you. In addition, we would like to present our transdisciplinary formats "TRAFOs" (Labs together with the city of Berlin, Trialogs and further own format developments) and highlight their advantages and disadvantages for the activation of researchers and how the self-understanding and role-understanding of researchers is affected within a transdisciplinary process. And we also want to give you an insight to our strategic co-design project "New Urban Agenda Berlin".

The case of the Leuphana University of Lüneburg. Transdisciplinary institutionalization in higher education: a two–level analysis

Bianca Vienni Baptista, TdLab, ETH Zürich, Switzerland; Silvia Rojas Castro, Leuphana University of Lüneburg, Germany

Universities are one of the main institutions of knowledge production and in charge of responding to recent changes caused by the increasing complexity of our society. Previous and current studies have called for transforming and restructuring higher education while arguing that universities' potential to solve societal problems has not been fully reached. In this context, transdisciplinarity (TD) has emerged as a solution to related problems.

In this presentation, we apply a neo-institutionalist perspective for analyzing the process of institutionalization of TD at universities. We consider TD from two iterative levels: (i) as a policy, and (ii) as a practice. We define policy as a series of decisions (i.e. regulations, statutes, or procedures) that aim towards a previously established goal. TD is a policy when a university decides to implement it as part of academic programs, research initiatives, and overall educational activities by initiating a set of actions whether they are reforms, plans, or guidelines. However, establishing a TD policy does not guarantee reaching its objective or implementing the actions it prescribes. Therefore, we also understand TD as a practice, i.e activities that bring TD policy and associated forms of knowledge production to life. This definition requires examining the process of institutionalization and analysing how TD is embedded in other policies and practices of Universities. We understand institutionalization as the processes by which a policy, set of activities or practices 'come to take on a rule like status in social thought and action. TD is thus enacted when it is practiced, exercised, or executed at a university.

The contribution of this study is to understand TD as a knowledge production process adding the level of policy to its definition. Our goal, then, is to systematically analyze the relationship between the two levels, from policy to practice, as well as the progress and obstacles encountered in the TD institutionalization process. We apply a qualitative methodological strategy to the interfaculty Methodology Center of the Leuphana University of Lüneburg in Germany. In doing so, we hypothesize that the TD institutionalization process at Leuphana University is characterized by both a top-down emergence in policy and a bottom-up consolidation in practices.

We take the Methodology Center at the Leuphana University of Lüneburg as a case study and analyze the institutionalization process of TD to shed light on the obstacles that TD faces to become a widespread policy and practice at universities. In adopting a neo-institutionalist approach in our research, we develop a two-level analysis that allow us to compare the formal characteristics given to TD policies with the actual TD practices taking place in universities. Our findings reveal that TD institutionalization at the Methodology Centre is at a mid-level and that overall TD institutionalization is an iterative process, in which the two levels mutually can reinforce or hinder each other. We also draw conclusions that build on the results of this study and open lines for future research, with recommendations from this analysis for other universities.

EXPLORING METHODS II (COMPOSED SESSION)

Friday, 13.09.2019, 08h40 – 10h20
[Antarktis]

I. Presentation:

Opening Conversations by Design Methods: Participatory Network Mapping

Elif Erdoğan Öztekin, A. İdil Gaziulusoy

Aalto University, Department of Design, NODUS Sustainable Design Research Group, Finland.

As the urgency for sustainability transformations increase, there is a growing need to mobilise action throughout society. Bottom-up initiatives, where action and change are driven by groups of social actors through self-organized mechanisms, hold potential for inclusive and just sustainability transformations in the long run. For collective transformations, it is essential to understand the dynamics of change-oriented action and learning at individual, organizational and community levels, and from situational and theoretical perspectives.

Social networks are among the major catalysers and/or hinderers of collective action. Quantitative methods for analysing social networks fall short in understanding network structures in relation to their context, change over time, content and meaning. Recently, methods for gathering and analysing qualitative data about networks are being developed to deliver thicker descriptions and deeper understandings of social networks. However, qualitative inquiry into networks is challenging since it aims to include both diverse interpretations of network actors and common patterns in network structures without falling into the trap of abstraction and over-generalisation.

In this paper, we introduce a design-based method for participatory network mapping (PNM), which aims to facilitate both data gathering and analysis with a collective and interpretive approach. By taking grassroots eco-communities as cases of "sites for change", we investigate the actors, constituents and dynamics within and across networks of eco-communities to understand how learning for transformations spread. We will present the method of participatory network mapping by providing instances and findings from its initial applications in real-world contexts.

Enabling multi-stakeholder interactions, facilitating social learning, joint problem-framing, mutual understanding, and collaborative planning and action are fundamental for transdisciplinary research aiming for transformative change. In the existing body of work, there is room for better integration of multi-stakeholder processes and critical reflexivity with problem framing, problem solving and social learning throughout the whole research process. Such improvements propose alterations in how knowledge is produced, and might reveal real world complexity (system knowledge), bring unprecedented solution alternatives to the surface (target knowledge). Moreover, inclusive and collective action can be enacted by means of increased interactions between actors, confrontations of perspectives, and alliances between disciplines (transformation knowledge).

Some researchers highlight co-creation process as critical in knowledge generation, for its significant agency in facilitating learning, initiating transformation and change from the very first stages of research. Co-design research and practice has accumulated knowledge and expertise in collaborative and participatory methods that pave the way for co-creation processes. In co-design, probes, generative toolkits, and prototypes have been used to engage people in generating data for future design. As such, design-based participatory methods evoke topical reflections and conversations, while they catalyse knowledge co-production, social learning and sense-making.

Based on these insights, we have developed and applied design-based PNM, which integrates co-design methods and qualitative network research, to gather and generate data about social networks formed around grassroots eco-communities. Our findings indicate that employing design-based methods offer vast potential to foster knowledge co-creation. Such that, while the process enables inclusive participation of network actors, it also expedites reflection on actors' networks, on the content and meanings of their interactions as well as on the past, present and target states of their social relationships. On the other hand, the process generates conversations between diverse actors, perspectives, expectations, and even conflicting parties, thus triggers reflexive processes. Such conversations create opportunities for loosening social inertia, building mutual understandings and, thus, turning the process of research into an opportunity to construct both social capital and intellectual grounds for sustainability transformations. Furthermore, the method allows simultaneous reflexivity and reflection for ongoing research initiatives, as the inquiry gets collectively reframed, reinterpreted and researched in real-world contexts with network actors.

II. Presentation:

Potential Methodological Contributions of Collaborative and Participatory Design to Theory and Practice of Transdisciplinary Research

Emīlija Veselova, A. İdil Gaziulusoy

NODUS Sustainable Design Research Group, Department of Design, Aalto University, Espoo, Finland

Keywords: collaborative and participatory design, design research, transdisciplinary methodology

Transdisciplinary research aims to address socially relevant problems by co-producing knowledge with stakeholders across and beyond academic disciplines. It seems to unfold in three jointly undertaken, interrelated and interdependent phases: problem identification, problem analysis and bringing results to fruition. As such, transdisciplinary research has similarities to collaborative and participatory design (C&PD) processes. However, currently, there seems to be little to no collaboration between the two areas. This presentation outlines two key areas – process and outcomes – in which transdisciplinary research could benefit from C&PD.

C&PD includes not only designers but also other stakeholders as active participants in the process. The included stakeholders can be the future users, citizens, decision makers or others who are implicated by the design process or its outcomes. In C&PD, designers are seen as experts of designing and facilitating the collaborative design processes. Meanwhile, involved stakeholders are viewed as experts of their lives, professional practices and worldviews who contribute valuable perspectives and knowledge from various domains.

The theoretical concepts as well as practical approaches, tools and designers' skills of C&PD could provide useful contributions to transdisciplinary research. For several decades, C&PD has researched stakeholder participation through practice and has built theoretical models of modes of stakeholder involvement. C&PD has also conducted research on tools, methods and approaches to plan, design and facilitate fruitful collaboration of stakeholders with different worldviews, interests and goals. It has also researched on and trained designers in reflexivity, facilitation, mediation and capacity building in others. One area of C&PD - participatory design - has explicitly focused on mutual learning, co-determination of problem spaces, deliberations of contradicting stakeholder views and shift of power dynamics. Meanwhile other areas - co-design and co-creation - have focused on developing methods and tools for co-development of solutions that would better satisfy the needs of all stakeholders. More recently, specifically in the context of sustainability transformations research, C&PD theory and practice has started to explore how natural entities, e.g. animals and ecosystems, could be viewed as stakeholders of design processes and constructively involved or represented within.

C&PD can also expand the repertoire of transdisciplinary research in co-envisioning, co-creating and co-developing solutions for societal problem-solving. It is an approach to designing that focuses on participation and is not pre-determined by a pre-set outcome. Thus, it can produce various types of solutions. A solution could be a report, a physical object, a digital platform, a service concept or a proposal for interventions to trigger large-scale systemic change. C&PD also has extensive experience in not only co-creating solution ideas with stakeholders but also prototyping and testing them to trial the impact and usability before the solution is implemented. For example, a prototype of a report can be tested with the future users of the information, or a service concept could be prototyped through reflective roleplay. Additionally, some areas of C&PD – e.g. meta-design and living labs approach - strive to extend this testing and adjusting also after the solution has been implemented. These approaches to solution building and shaping and the expertise in collaborative processes of C&PD described above could significantly contribute to further development of transdisciplinary research.

Key readings:

Buchanan, R. (2001). Design research and the new learning. *Design issues*, 17(4), 3-23.

Steen, M. (2013). Co-design as a process of joint inquiry and imagination. *Design Issues*, 29(2), 16-28.

Simonsen, J., & Robertson, T. (Eds.). (2012). Routledge international handbook of participatory design. Routledge.

III. Presentation:

MathWeave: an Exemplar of Transdisciplinary Work

Eva Knoll[1], Wendy Landry[2], Tara Taylor[3], Paul Carreiro[4], Katie Puxley[1]

[1]Mount Saint Vincent University; [2]Independent scholar; [3]St. Francis Xavier University; [4]Halifax Regional Centre for Education

Keywords: exemplar, mutual interrogation, horizontal hierarchy, emergent methodology, art/mathematics/education

Since 2011, a group of scholars, teachers and artists, who call themselves MathWeave, have been meeting on a roughly monthly basis to explore together the relationship between art, mathematics and education, to our mutual

professional benefit. Initially, we worked by mainly following our interests, taking the time to develop an understanding of the many fields of practice that contribute to our work, including, in addition to the aforementioned, cognitive science and its applications to learning and teaching, and the philosophy and history of ideas, in mathematics, science and technology. This led us to consider the nature of the link between mathematics and the design, creation and appreciation of crafted artefacts, particularly constructed textiles, and how this link could prove fruitful for education purposes. Later, we focused on aspects of learning in mathematics and in art making that prove problematic in both contexts.

More recently, we have been considering the unique methodological attributes of our approach, and after consulting yet another discipline, that of the philosophy of disciplinarities, have outlined our framework as one of transdiciplinarity. This examination of our own practice has taken the form of a collective auto-ethnography. For this conference, we propose to delineate some of the elements of our approach that we have found to contribute to the efficaciousness of our work. These elements can be typified in various ways, including whether they are properties of the context of our work, of our aims, goals and stakes, of the specific participants, or of the approach itself. In this presentation, we will delineate some of these elements and connect them to outcomes that we see as deriving from them. The ultimate aim of this work is to develop a generalizable framework for transdisciplinary groups involved in research-practice.

IV. Presentation:

Charettes and CoNavigator: Combining methods to support collaboration across time, space, institutions and disciplines

Katrine Lindvig, Line Hillersdal, David Earle

CoNavigator IVS

Keywords: Transdisciplinary collaboration, CoNavigator tool, Charrettes

The team behind CoNavigator, a hands-on interdisciplinary collaboration and problem-solving tool, look to another collaboration method – the charrette – for inspiration and potential for combination.

A common method for transdisciplinary collaboration, particularly in the US public sector, is the charrette. With roots in 19th century Parisian art academies, it has since found its way to becoming a core method for holistic collaboration, design and problem solving for federal projects across the US. It is particularly successful when public consultation in the decision making and design process is both necessary and desirable. Charrettes are seen as an effective method for including wide ranges of disciplines, stakeholders and the public in general into the creative, design and planning phases, and allowing the appropriate level of involvement and complexity for each to function and participate optimally. Usually in the form of highly focused and intensive multi-day sessions, and often having more than one iteration over the course of larger projects, they aim to foster collective creative and experiential input and reach an informed consensus and plan of action.

The CoNavigator tool's genesis also lies in the creative industries, and help interdisciplinary groups to collaborate on a 3-dimensional visualization of the interdisciplinary topography of complex themes or problems. It addresses the contextual and local circumstances and unique combinations of members in collaborative themes. CoNavigator therefore refers to navigation of both collaboration and context. It aims to ensure shared understandings, democracy of ideas and opinions, and identify both common and uncommon ground between participants (CoNavigator.org).

In this session, we introduce and compare The NCI Charrette System™ (based in Michigan State University) and CoNavigator as two distinct approaches to interdisciplinary collaboration. We then suggest ways in which CoNavigator sessions could be incorporated as a method for carrying out core parts of the charrette process, particularly interdisciplinary sessions, consultations, brainstorms and multiple feedback loops. We end with a joint discussion of how the combination of different approaches (including digital) can support and enhance future collaboration across time, space, institutions and disciplines.

Key Readings:

Lennertz, Bill, & Lutzenhiser, Aarin (2017): The Charrette Handbook, https://www.canr.msu.edu/nci/resources/

Lindvig, K, Hillersdal, L, & Earle, D (2018): CoNavigator: Hands-on interdisciplinary problem solving,
    https://i2insights.org/2018/02/13/conavigator-for-interdisciplinarity/

MORE THAN TEACHING – TRANSDISCIPLINARY CAPACITY BUILDING III

(COMPOSED SESSION)

Friday, 13.09.2019, 08h40 – 10h20

[Sydamerika]

I. Presentation:

A Transdisciplinary Approach to Sustainable Life Systems in Colombia's University Education

<u>Raphael Ferbas</u>

Faculty of Social and Human Sciences, Universidad Externado de Colombia, Colombia

Keywords: Sustainable life systems, Indigenous epistemologies, Master's programme

As an example of transdisciplinary education in universities, in the context of the crisis of Western civilization, this abstract deals with the cultural and epistemological framework of sustainable life systems in Colombia and provides a short presentation of the same named Transdisciplinary Master at Externado University in Bogotá.

The dominant public narrative tends to neglect the systemic causes of climate crisis; policies see the solutions in the transition towards a low or zero carbon economy without questioning the deeper cultural roots of the crisis. In our programme it is more appropriate to speak about a civilizatory crisis, and it is necessary to go beyond sustainable development that aims to sustain development within a modern-capitalist framework of a material growing economy and has contributed to the homogenization of our systems of knowledge.

The Colombian territory is a region of enormous biocultural diversity that has preserved ways of life and epistemologies not colonized by Western civilization. A holistic view of life is native to indigenous communities, who refer to life systems when relating to the dynamic relationships between nature and culture, according to them ecological and human dimension of life is actually not separable from each other. Western science, offers an approach to the understanding of life systems by dealing with socio-ecological and living systems, but these concepts cannot fully grasp the meaning within millennial cultures. Especially ecological sustainability is an unfamiliar idea to indigenous communities, as their ways of life usually have not caused major disbalances in their surrounding natural systems. In contrast to Modern civilization they do not interfere with nature's inherent ability to sustain life (Capra 1996); accordingly, in the context of global crisis, regenerating sustainable life systems is possible by transferring the principles of life from natural systems into human systems, taking into account not only scientific and but also biocultural knowledge. This is important because Modern science can be linked to current problems of sustainability, as it has seen nature as an object that must be controlled in order to serve human needs, trying understand reality by separating it into its parts. Consequently, academic disciplines and research methods tend to be based on anthropocentric and reductionist world views that resulted in education systems, which have failed to address our contemporary systemic problems.

As a result, the Transdisciplinary Master in Sustainable Life Systems provides an academic experience under new paradigms, educating students from a transdisciplinary perspective in order to learn to design human systems in which life is central. In response to the profound social, ecological, economic and epistemological disruptions of the 21st century, the transdisciplinary approach promotes the confluence of science and other knowledge in a holistic understanding of reality to deal with complex situations with systemic understanding and methods going beyond the academic disciplines. The programme incorporates the study of natural and social systems within a holistic education of the mind, the body, the heart and in growing relationship with others for the collaborative management of sustainable human systems in balance with nature. Professionals of any discipline are encouraged to act as agents of change with the ability to carry out transdisciplinary research, and to redesign processes and social systems towards sustainability and regeneration in various fields, organizations, public institutions and communities in relation to their internal dynamics, the environment and the systems of life as a whole.

II. Presentation (short):

What should education be like? Fostering awareness and practice of intrinsic nature of self

<u>Tomohiro Akiyama</u>[1,2,3,4]

[1]Graduate School of Frontier Sciences, The University of Tokyo, Japan; [2]Department of Medical Engineering, Faculty of Engineering, Tokyo City University, Japan; [3]Graduate School of Global Environmental Studies, Sophia University, Japan; [4]Kyoto Forum Foundation, Japan

Keywords: Integrity, ego, intrinsic self, negative capability, Makoto

According to Ito (1997), we have now a responsibility to create a new civilization. Future of mankind does not exist in the extension of conventional development, such as, Scientific Revolution, Industrial Revolution, and Information Revolution. The on-going revolution is called Environmental Revolution because the environmental problem involves all aspects of the human activities. It is a revolution that take place inside human beings. What should the future of education be like? Previous studies have indicated a necessity of integral education so as to overcome education principles in modern times (e.g., Akiyama, 2016; Akiyama et al., 2010; 2012; Akiyama and Li, 2013; San Carlos et al., 2016). However, empirical studies to evaluate educational effect of integral education are still limited. It is still unclear whether the integral education have positive effects. The objective of this study is to empirically investigate educational effect of integral education. To this end, we conducted an interview survey to those individuals who participated in meetings of Kyoto Forum Foundation where a large range of learners from children to adults gather together.

We established a framework of integral education based on the integral theory proposed by Wilber (2000) as well as Akiyama et al. (2012) and Akiyama and Li (2013). The core of the integral framework is a 4-quadrant framework which advocates any reality can be seen from four different aspects, namely interior and exterior aspects of individual and collective. Based on the proposed framework, we analyzed Kyoto Forum Foundation which is a place open to anyone to learn how humans should live their lives. They deepen diverse disciplines from Shintoism, Buddhism, Confucianism, Neo-Confucianism, Theology to a variety of sciences as well as to develop Public Philosophy. They reflect their past lives so as to find intrinsic nature of self and open themselves to public. We conducted an interview survey to 1,146 participants who joined Kyoto Forum Foundation in the fiscal year of 2018 to investigate their changes before and after participation.

Results show that integral learning at Kyoto Forum Foundation is a momentum of awakening of intrinsic self, which results in enhancing participants' capacity in all quadrants. All the participants became aware of the fact that they were tied up to their own ego, to knowledge, to organizations they belong to: they were ruled by many stereotypical ideas. There were even some participants who had awakened their intrinsic self. Integrity of an individual was retrieved in the process to seek for complete harmony of three parts in human mind which are cognitive, emotional, and conative parts. The significances of the awareness of intrinsic self are three-fold. Firstly, when the three parts came into a complete harmony, their beautiful soul started displaying beautiful deeds. This is what we say "Makoto" in Japanese. Secondly, they became to discover the works of Makoto not only in themselves but in others, and started making resonant effect. This is the state people's true selves enhance each other, which is fundamentally different from pyramid-shaped community. Thirdly, they became free from suffering and hesitation after they started doing their Makoto every single moment. They realized the way they live their life with nothing constraining them is the real happiness. When this state lasts over generations, the happiness becomes ubiquitous. Moving beyond Epistemology, the integral learning is significant especially in terms of fostering awareness and ability to practice of intrinsic nature of self. We highlight the learning can be incorporated into any level of education.

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III. Presentation:

Legit Failz: Training academia in techniques of improvisational theatre

Marius Korsnes[1,2], Sophia Efstathiou[1,2], Sven Veine[1,3], Martin Loeng[1,2], Kristoffer Nergård[1,2], Giulia Sonetti[4]

[1]Norwegian University of Science and Technology (NTNU), Norway; [2]Gibberish Improvisational Theatre; [3]Improoperatørene Impro Group; [4]Politecnico di Torino

For interdisciplinarity to work we need ways to allow for failure/wrongness. This is necessary to achieve a measure of "success" which is more broadly anchored than individual academic disciplines' existing norms. We propose that exercises and principles from improvisational theatre help us train acceptance, trust and failure: how to make and accept offers but also accepting rejection and lack of control. These skills, to accept, trust and fail, are crucial for a mutual learning mindset, that is much needed in interdisciplinary work settings.

"Knowing why as well as how lets you improvise on the spot like a chef rather than plodding through a recipe and hoping the dish comes out right." (Schwarz, 2013, xi). What are the principles to get stuck far less often, achieve higher levels of performance, have better working relationship and enjoy greater wellbeing? According to Schwarz, there are two contrasting approaches to team leadership, unilateral control and mutual learning (Schwarz, 2013). The unilateral control approach, also known as "the one leader in the room", is a mindset that 98% of all professionals, whether team leaders or team participants, slip into when serious challenges are affecting the team (Argyris & Schøn, 1974; Putnam, Smith & McArthur, 1997; Schwarz, 2017). The mutual learning mindset, on the other hand, does not mean that the team starts making all decisions by consensus. Rather, it means that each team member is responsible for helping to lead the team – taking initiative and sharing accountability for the team's functioning and results (Schwarz, 2013, p. 23).

In this presentation, we argue that improvisational training facilitates a mutual learning mindset that is key for achieving successful interdisciplinary teamwork, providing examples from several years of experience with improvisational theatre as well as sustainability-related research. Within sustainability research, for instance, it is clear that translating research into impact is not a linear process: it demands skillsets that are often complementary to those of mono-disciplinary work, and it needs spaces for collaborative ideas, practices and ethos to flourish (Efstathiou and Mirmalek, 2014). Facilitating collaborative and participatory research is at the core of addressing sustainability issues yet training for this type of skills is rarely prioritised. What is more, using sustainability as an organising framework involves addressing ethical questions about how Earth's resources should be shared as well as understanding that sustainability is also about issues such as 'cultural identities, social and environmental equity, respect, society-nature relationships and tensions between intrinsic and instrumental values' (Wals and Jickling 2002, p. 223). Thus, there is no unilateral agreement about what sustainability is – making interdisciplinary work hard.

Improvisational theatre provides useful tools for dealing with uncertainty, encouraging failure and nourishing trust to create good collaborative environments. A principle that is useful in achieving mutual learning is to "state views, and ask genuine questions" (Schwarz, 2013). The main point is that if you state your views and ask genuine questions, you are automatically transparent and curious. Thus, we suggest an "offer-based" dialogue as a way forward to achieving productive interdisciplinary work: Making offers and building on ideas, keeping the teaching and research process open-ended and open for participation. The trade-off is a lack of control, but the benefits are solutions that address the issue at hand more comprehensively.

IV. Presentation (short):
Developing a conceptual framework on coastal resilience to guide transdisciplinary research in the Chesapeake Bay region

<u>Justin Lee Shawler</u>[1], Vanessa Constant[2], Amber Leasure-Earnhardt[3], Ali Mohammad Rezaie[4], Laura Szczyrba[5], Janie Day Whitworth[6]

[1]Virginia Institute of Marine Science, College of William & Mary, USA; [2]Oregon State University, Department of Integrative Biology, USA; [3]George Mason University, Department of Civil, Environmental, and Infrastructure Engineering, USA; [4]College of William & Mary, School of Law, USA; [5]Virginia Tech, Department of Geosciences, USA; [6]University of Virginia, School of Architecture, USA

Keywords: coastal resilience; climate change; conceptual framework; graduate students

Sea-level rise is projected to displace hundreds of millions of people around the globe by the end of the 21st century. Because of this threat, retreat from large portions of the coast is inevitable. However, depending on the region, retreat may be infeasible due to political, legal, and economic challenges. Thus, efforts to improve coastal resilience should apply transdisciplinary approaches that consider these factors. We discuss the process pursued to develop an integrated conceptual framework for coastal resilience and to create innovative transdisciplinary research questions. Our interdisciplinary team of graduate students from five universities with backgrounds in law, landscape architecture, geosciences, ecology, and engineering, was brought together as part of a National Science Foundation "Innovations in Graduate Education" grant. We began our transdisciplinary process by establishing a foundation of collaborative understanding based upon our individual knowledge bases. To illustrate the current paradigms within our individual expertise, we created and presented frameworks based upon our unique disciplinary perspectives. Through formal and informal discussions, we developed a collective vision for describing the relevant processes of coastal resilience. Through these discussions, we developed a conceptual framework which drew from visualization techniques used in systems thinking and scenario planning, yet transcended our individual disciplines. Our team

worked to ground the conceptual framework in current literature to define hazards/stakes, adaptation/mitigation, resilience, and state of resilience. This required discussion and negotiation, as well as adaptation, given that some disciplinary distinctions led to definitional differences.

To meld disciplinary boundaries, we avoided the traditional "box and arrow" approaches to systems thinking that often separate human and environmental stakes/hazards. Instead, our framework incorporated a gradient of resilience states, which could be determined by the relative proportion of hazards/stakes and adaptation/mitigation actions associated with human-environment interactions. With ongoing unprecedented global environmental change, we acknowledged that increased adaptation and mitigation were the primary drivers of increasing resilience. While resilience could increase, it could also decrease as environmental, political, and social changes occurred. Additionally, destructive events could reduce community resilience. In states of low resilience, a destructive event such as a natural hazard could have a greater impact, causing the system to shift to a substantially lower resilience state. This is especially concerning given the uncertain influence of climate change on the size and impact of future natural hazards. However, in a high state of resilience, the impact of a destructive event might be relatively reduced and thus require fewer, post-event adaptation/mitigation measures to achieve the pre-event resilience state.

To test our framework's ability to address relevant transdisciplinary research questions, we investigated one complex issue in Chincoteague Island, Virginia, a representative rural coastal community in the Chesapeake Bay region of the United States. We elaborated upon and implemented our conceptual framework by engaging in discussions with relevant stakeholders from Chincoteague. We then used their feedback and input on local needs to revisit our framework and generate and refine a range of research questions. We used our framework as a design-thinking tool, to avoid discipline specific questions, allowing our team to find cross-cutting relationships between questions. Ultimately, the framework and stakeholder engagement process led us to a research topic that integrated our entire team's disciplinary knowledge, and required the generation of new, community-based knowledge from outside our core expertise. Using our framework and applied questions, we developed a transdisciplinary research proposal to address this complex issue and the challenges of coastal resilience in this part of the globe. By sharing our process, we offer an example of how unique and integrated theoretical approaches can be applied to generate novel lines of inquiry across disciplines.

GO-BETWEEN OR CRITICAL FRIEND: THE ROLE OF INTERMEDIARIES IN TRANSDISCIPLINARY RESEARCH ON SUSTAINABLE CITIES

Friday, 13.09.2019, 08h40 – 10h20
[Nordamerika]

Organiser(s): Anna Taylor[1], Zarina Patel[1], Amy Davison[2], Magnus Johansson[3]
[1]University of Cape Town, South Africa; Zarina Patel, University of Cape Town, South Africa; [2]City of Cape Town, South Africa; [3]Malmö University, Sweden

Transdisciplinary research involves a diversity of people and knowledge (including theoretical, research-based knowledge and experiential, practice-based knowledge) that need to be drawn together and integrated in ways that generate new knowledge and new approaches to complex societal problems, like making cities more sustainable and climate resilient. Yet most people struggle to operate outside of their 'home spaces' – the professional, disciplinary, organizational and sectoral spaces and the communities of practice where their expertise and authority are well recognized and they are well understood. Many feel at sea, misunderstood and frustrated when engaging in processes that require them to step into a 'third space' or shared space, where knowledge, values, ways of working and the importance of different products and outcomes are challenged and contested. How do we manage these in-between spaces and broker engagements between disparate communities, to bring together different perspectives and priorities in a productive way that generates transdisciplinary knowledge and collaborative action? This session explores the role of intermediaries in navigating and bridging these boundaries.

The session draws on the experiences of three multi-year programmes in which intermediary roles have been created between the university and the city government, including the roles of embedded researcher and municipal PhD student. These are the Mistra Urban Futures programme, particularly as implemented in Cape Town, the Future Climate for Africa programme, particularly the FRACTAL project implemented in Windhoek, Lusaka, Maputo, Harare,

Durban and Cape Town, and the Skåne research partnership in southern Sweden, involving universities and municipal governments in Lund, Malmö and Alnarp. In all of these programmes researchers and practitioners have joined forces to find new ways to tackle strategic sustainable development challenges at the municipal or city regional scale, particularly relating to climate resilience, mobility and urban design.

The session raises questions about: the skills and competencies of TD intermediaries; the power dynamics of boundary crossing; TD problem formulation; a new generation of TD supervisors and coordinators; brokering partnership agreements at both the strategic and administrative levels; and developing TD approaches to evaluating research quality in terms of the problem, process and product.

Description of the session design

The 90 minute session will be organized as a panel discussion consisting of 6 panellists, made up of 3 sets of pairs. Each pair will be one intermediary and one representative from an organization that intermediary worked with. In rounds of inputs, each pair will: (1) briefly describe the context and substantive focus of their transdisciplinary work; (2) explain how the intermediary role was set up, including what the expectations or terms of reference for the intermediary was; and (3) reflect on the opportunities, challenges and impacts of intermediation. There will be opportunities for questions and inputs from the audience at the end of each round.

Stream and questions

The proposed session aligns the societal transformations stream, with strong linkages to the methodological innovation stream. By focussing on the role of intermediaries, the session explores questions of regarding the forms of organising, skills and competences needed to initiate and sustain transformations, with particular reference to fostering collaboration and co-producing knowledge between different types of stakeholders. It also addresses the question: How can universities promote collaborative learning?

TRANSDISCIPLINARY APPROACHES TO NATURAL RESOURCES- AND CLIMATE MANAGEMENT (COMPOSED SESSION)

Friday, 13.09.2019, 08h40 – 10h20
[Asien]

I. Presentation:

Innovations for Sustainable Land Management

Jana Zscheischler, Sebastian Rogga, Thomas Weith

Leibniz Centre for Agricultural Landscape Research

Keywords: sustainability innovation; transdisciplinary research; governance; leverage points; comparative case study

Many sustainability problems are connected to land use and there is a high sense of urgency for socio-technological change and transformation of current land use practices. In this context, many scholars have emphasised the vital role of designing and steering efficient innovation processes (e.g. Elzen et al. 2004, Schot & Geels 2008).

However, envisaged sustainability innovations differ from other types of innovations. They serve long-term societal goals but mostly lack direct marketing or commercialisation potential. Since management of land is highly regulated in many countries of the world, land management innovations have to take regulation compliance into account. It is deeply embedded into socio-ecological systems and thus frequently contradicts with social practices, regulations and existing infrastructure.

As it is still weakly understood how transformation and socio-technological change in the specific field of sustainable land use and management can be effectively governed and supported, the aim of this talk is to contribute to this knowledge gap. We will present findings from a comparative case study on nine local innovation research projects from Germany that sought for solutions towards more sustainable land management (SLM) practices. After the introduction of a theoretical framework that supports capturing the specific nature of innovations for sustainable land management, the presentation examines i) the characterisation, leverage points and socio-technical imaginations of innovations for SLM, ii) approaches to manage the innovation processes, and iii) interactions with persisting rules, structures and networks.

Results show that innovations for SLM start with diverse problem framings, emerge from distinct action fields and reflect various socio-technical imaginaries that predetermine trajectories of transition. Furthermore, there is a broad variety of innovation types focussing on different leverage points. All projects applied multi-actor approaches to

facilitate reflexive processes of learning and cognitive reframing, optimising the innovation, and interacting with persisting structures and communities.

References:

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II. Presentation (short):

Conditions for successful knowledge co-production: Insights from river management

Jennifer Henze[1], Barbara Schröter[2], Christian Albert[1]

[1]Leibniz University Hannover; [2]Leibniz Centre for Agricultural Landscape Research (ZALF)

Keywords: transdisciplinary water research; knowledge co-production; stakeholder interaction; knowledge systems; triangulation approach

Navigating the evolution of river systems towards more sustainable pathways requires the active involvement, collaboration and coordination of diverse actors from science and practice. Identifying relevant stakeholders, understanding and connecting their different knowledge systems are an important prerequisite in order to design and implement successful participatory river landscape governance. Proponents of environmental planning and management sciences generally presume that the participation of relevant actors from science and society yield a collective generation of knowledge. However, only limited and scattered evidence is so far available supporting this claim.

The aim of this contribution is to report and reflect upon the transdisciplinary research design and methods used to investigate the evolution of knowledge production (and eventually co-production) in a case study of governance of the Lahn river landscape, Germany. Therefore we accompany the EU-LIFE project LiLa – Living Lahn in their process with the aim to enhance the ecological health and connectivity of the river and to develop an overall concept, called the Lahn Concept, integrating all relevant interests along the river.

Knowledge integration and the exchange of information and knowledge occur by the recognition of different knowledge claims and systems, so that they can be incorporated into a common pool of shared information and understanding. As is evident from the literature, knowledge co-production still challenges the actors from science, practice, and governance with problems that mainly concentrate on the interface between science and practice. Here the interactions of different actors during the process are considered a key point as their different knowledge systems often lead to misunderstanding and conflicts. In order to provide a better understanding of conditions for knowledge co-production, we focus on the existing knowledge backgrounds and changing perspectives over the process as revealed in the actors' behavior and values during the transdisciplinary process.

Therefore we developed a research design that tries to connect data from an individual level with data from an interactive collective level through different methods:

For the stakeholder analysis on the first stage we had participant observations in meetings of the case study project in order to learn about the activities of the people under study in their natural setting. After this first free approach, we decided to obtain more information about the different interests, aims, and intentions of the involved decision makers on an individual level before we could analyze the interactions between them. Therefore, in the second stage, we conducted twelve qualitative individual interviews with the involved representatives of the partner institutions.

Within a still ongoing workshop series containing five workshops with the actors of the case study project over three years, we observe interactions between the participants in order to analyse their individual and collective behavior. Therefore, in the third stage, we had focussed group discussions on different topics in every workshop. The idea of the workshop series is based on the concept of real-world experiments that can function as a 'boundary setting' in a transdisciplinary research process. The analysis of the empirical material based on a qualitative content analysis following the analytical methods of theoretical coding.

The results provide evidence for a better understanding and change of perspective through a multi-level research design that tries to combine the different empirical data from the individual and the interactive collective level in an ongoing process through a methodological triangulation. We state that the proposed methodology could improve decision-making processes in such a way that mutual project understanding is promoted through individual and

collective exchange. Additionally, through early stakeholder awareness the quality of later decisions is improved in terms of social robustness.

III. Presentation (short):
Experiences from a participatory action research project on agroforestry in Sweden
Christina Schaffer[1], Karin Eksvärd[2], Johanna Björklund[3]

[1]Stockholm University; [2]Inspire Action & Research; [3]Örebro University

Modern industrial agriculture effects many sustainability problems and there are several approaches aiming to contribute to sustainability solutions. Among them, agroforestry practices (the integration of trees in farming) is promising regarding food provisioning and its positive effects on biodiversity, carbon binding, improvements on soil quality, as well as on livelihoods and local communities, especially in tropical areas. However, there is little research on such systems in temperate areas, therefor a pilot project on agroforestry in Sweden was conducted by a participatory action research (PAR) group between 2012-2016. The research outputs were establishments of different types of agroforestry systems at 12 farms, testing of new crops and new platform for learning. The outcomes were extensive study visits at the farms, media attention and that the PAR-group became a part of a larger emergent agroforestry movement in Sweden. The PAR-process was a fully joint project between farmers and researchers in all phases: from formulating the research questions, implementation, observations, documentations and report writing. All participants met at each others farms to share experiences at 9 workshops, that was facilitated by two researchers. The PAR-process was a fruitful method for transitions; real agroforestry systems were established and can be used for future investigations. Regarding sustainability, agroforestry could contribute to the transition towards sustainable agriculture in Sweden, but there are many challenges regarding on how to go from innovation and the niche level to the regime or landscape level.

IV. Presentation (short):
Assessing UseUClim´s living lab approach to co-develop the new urban climate model PALM-4U
Bettina Steuri, Jörg Cortekar, Steffen Bender

Climate Service Center Germany (GERICS) at Helmholtz-Zentrum Geesthacht Zentrum für Material- und Küstenforschung GmbH

Cities and urban agglomerations are particularly vulnerable to the expected impacts caused by climate change. A building-resolving urban climate model as a tool for urban planning can contribute to prepare to these issues. Such a model enables demand-oriented and practical actions for climate change adapted development in urban planning. However, currently available urban climate models and their results do not correspond to the level of expertise of the various user groups, such as urban planners or project developers, and their respective computing infrastructures. A transdisciplinary approach is necessary in order to develop an urban climate model that is useful for non-scientists or non-expert users and support cities and municipal urban planners – and other stakeholders – in their daily work. This allows to integrate stakeholders from the very beginning to ensure that their requirements are identified and thoroughly addressed in the model development.

The German research programme *Urban Climate Under Change [UC]²* (http://uc2-program.org/en), aimed at the development, validation and application of an innovative high-resolution urban climate model (PALM-4U) for entire cities. [UC]² was organised in three interconnected modules working on the model development (module A; MOSAIK; https://palm.muk.uni-hannover.de/mosaik), observational data and measurements (module B; 3DO; http://uc2-3do.org/en), and user engagement (module C; UseUClim and KliMoPrax; https://uc2-klimoprax-useuclim.org).

The UseUClim project reviewed PALM-4U's user-friendliness and practicality by applying the living lab approach. The living lab was structured in three consecutive steps starting with the exploration of the users' requirements (phase 1) based on a desk research, a structured literature analysis, an online-survey and several workshops. The results of this exploration phase were made available to modules A and B for consideration in their respective activities. Within the scope of the experimentation (phase 2), selected users from practice were trained to work with the model and provided a first feedback on its user-friendliness and practicability. During the evaluation (phase 3), the prototype was reviewed based on the previously identified requirements and the feedback from the practice partners. The

findings were compiled in an evaluation report including recommendations on further potential model improvements.

The success of the co-developing a scientifically innovative and practicable urban climate model is based on a continuous process of practitioner and scientist engagement. Both provide crucial input to the model development and contribute to bridging the usability gap. UseUClim took on the role of the neutral intermediary between the two sides and, thus, enabled a linkage as well as provided an effective information transfer between the modelling community and the users from practice with their everyday requirements. To fulfil this position, UseUClim carried out an array of diverse activities and tasks – such as managing and clarifying expectations or facilitating platforms for a systematic science-user interaction. After the project completion, an online-survey in order to examine how the participants perceived the transdisciplinary research approach. Was it meaningful and purposeful? How did the partners from science and practice experience UseUClim´s work? With the aid of the survey findings, UseUClim´s living lab approach was assessed and valuable recommendations for the second funding phase, which starts in fall 2019, could be derived.

V. Presentation (short):
In-house-evaluation of a transdisciplinary research product – a case study from the field of climate service

Elke Keup-Thiel, Susanne Schuck-Zoeller
Climate Service Center Germany

Keywords: in-house evaluation, co-creation processes, methodology, climate services

Global climate change has different regional impacts, which are already noticeable today. We will have to adapt to these different impacts, and this poses a challenge to a range of policymakers. To meet the needs of policy- and decision-makers the Climate Service Center Germany (GERICS) closely co-operates with partners from politics, economy and administration. Jointly prototype products in the area of climate services are developed, tested and implemented.

Hence, scientists working in the field of climate service are highly interested to enhance the applicability of research & development results and therefore realize the transdisciplinary research mode.

The development of comprehensible, effective climate service products is one of the main targets of climate services. To assure quality the evaluation of the resulting products is crucial. As an object to evaluation a product series was chosen, that the Climate Service Center Germany (GERICS) had jointly developed together with the German Development Bank. This series, the Climate-Fact-Sheets are still one of GERICS' flagship products. The GERICS Climate-Fact-Sheets provide information about climate and climate change for countries, regions and/or climate zones including an expert judgement, as well as the bandwidth of the climate change signal in a concise, standardised way. The GERICS Climate-Fact-Sheets were chosen as an example for a transdisciplinary research product. A case study for their ex-post evaluation was designed in-house and combined with the target to test the appropriate methods.

This in-house evaluation focused on the outputs and outcome of the products. GERICS used a set of 12 criteria and more than 30 indicators to test the usability and transferability of the GERICS Climate-Fact-Sheets. This set was chosen according to the product objectives. The criteria and indicators are part of an evaluation framework having been identified, collected and discussed within an interdisciplinary working group of the "Polar regions And Coasts in the changing Earth System" (PACES II) research programme of the German Helmholtz Association.

These evaluation criteria and indicators were tested in our case study for the first time. Taking the advantage to use as many criteria and indicators from the whole framework as possible, an implementation and analysis of four single surveys and/or interviews with different target groups were performed.

In the presentation, the comprehensive in-house evaluation will be introduced with a focus on the different evaluation methods. The talk will take into account the co-creation process of the product series and highlight some results in terms of different criteria, such as scientific quality, the use, or the practical relevance of the products.

Friday, 13.09.2019, 08h40 – 10h20

[Foyer/Lobby]

URBAN FORUM PRACTICE MEETS ACADEMIA: FLOOR TALKS (PART II)

Organiser(s): Lisa Diedrich[1], Per-Johan Dahl[2]

[1]SLU Urban Futures; [2]Urban Arena at Lund University

For details, see description on page 90.

Friday, 13.09.2019, 08h40 – 10h20

[Foyer/Lobby]

URBAN FORUM PRACTICE MEETS ACADEMIA: FLOOR TALKS (PART II)

CONCLUDING PLENARY

Friday, 13.09.2019, 10h50 – 12h30
[Wallenbergsalen]
Matthias Bergmann, Thomas Jahn, Flavia Schlegel, Merritt Polk, Henrietta Palmer, Tobias Buser

Keynote I: Transdisciplinarity as critical transdisciplinarity
Matthias Bergmann, Thomas Jahn, ISOE – Institute for Social-Ecological Research, Germany

Over the past 20 years, the transdisciplinary research approach has written a success story calling for a great deal of commitment and persistence on the part of its actors, especially in the early stages. The ITC conferences of the last decade also had a significant part to play.

This success story is, moreover, an exercise in critical self-reflection and differentiation. Today, transdisciplinary research is regarded as standard where the issues of change, transformation and sustainable development are concerned - even if there are different ideas about what transdisciplinarity is and how it should be practiced in research.

Recent years have seen the development of new approaches and framings in an attempt to strengthen the effectiveness of research in societal transformations. One consequence has been a weakening of the theoretical foundations of transdisciplinary research. Research that draws on the transdisciplinary research mode tends to transition from a scientific approach to the mere application of participatory processes.

As a result, one can observe a new debate developing between two opposites. At one end, transdisciplinarity is equated more with a straightforward design task for the participative generation of 'problem-solving knowledge' and its immediate testing in the implementation of social transformation strategies. At the other end, transdisciplinarity is located more within science, where it is introduced as a research principle that changes the disciplines and disciplinary boundaries when dealing with complex problems.

This—if you like—separation into a practical and a theoretical branch of transdisciplinarity is not helpful. The two sides belong together, because the scientific treatment of societal problems usually encounters gaps in scientific knowledge and is thus linked to original scientific problems.

To overcome this separation, we would like to take up the idea of a self-reflexive understanding of transdisciplinarity as 'critical transdisciplinarity' and give the participants some pointers along the way. We want to emphasize critique as an intellectual resource and social practice within transdisciplinary research, showing it to be a special quality of transdisciplinarity that often resonates but is seldom spelled out and used consistently. Critical transdisciplinarity can also influence and change the sciences as a whole and approaches to research in general.

Critical transdisciplinarity focuses on whether research can actually keep its promises for applicable solutions to a given problem and looks at its analytic power to better understand the current situation with regard to trust between society and science

- when there can be no clear solutions;
- when facts are questioned;
- when science is often the trigger for the problems;
- when politics is unenlightened and resistant to advice;
- when science is branded as an acquirer of acceptance.

Is the democratic opening of science and research a way to help overcome such phenomena? Is it possibly the only way? Or is it not (self-)critical enough to see its limitations? What about reflecting on the consequences and practical effects of the research results, along with the scientist's responsibility for them?

We will present what we consider to be the four key characteristics of 'critical transdisciplinarity'.

Keynote II: How can transdisciplinary research be fostered in science policy and international public institutions?
Flavia Schlegel, Special Envoy for Science in Global Policy, International Science Council (ISC), France

Highlights and perspectives from the conference organisers
Hannah Saldert, Merritt Polk, Henrietta Palmer, Tobias Buser

Participants' perspectives

Friday, 13.09.2019, 13h45 – 17h15

EXCURSIONS

[meet at the conference reception]

More information on excursions and registration at the conference reception

Walking tour Frihamnen – a case of sustainable urban development
Hannah Saldert
University of Gothenburg, School of Global Studies

Frihamnen is one of the development sites in the larger development project RiverCity Gothenburg. The RiverCity is one of the largest urban development projects in Scandinavia today. The objective is to build a total of 25,000 new apartments and 45,000 new workplaces along the river Göta Älv, which passes through the center of Gothenburg. The city has deemed this development important both because of a need to counteract segregation and to attract new business and tourists to the city, as well as to satisfy housing needs for current citizens. The development process is aiming to be inclusive, holistic and generate learning through testing new ideas. This have been done for example through dialog with citizens, NGOs and private actors, as well as involving them in parts of the construction through *place-making*. During this walking tour you will learn about the ongoing planning process of Frihamnen, the plans for the area, the challenges that arises and how the project is dealing with them. We will walk through the area while talking about the coming plans, as well as see some examples of the place-making activities in the area, such as the world famous sauna, the public pool and the park *Jubileumsparken*. Make sure to wear comfortable footwear and bring an umbrella/rain coat in risk of rain. Expected duration: about 3 hours (including traveling time from the Wallenberg Conference Center).

Additional excursions
More information on excursions and registration at the conference reception

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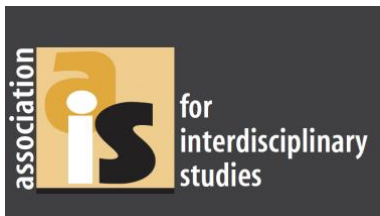
ACC — African Centre for Cities

ISOE — Institute for Social-Ecological Research

AIS – Association for Interdisciplinary Studies

SLU – Swedish University of Agricultural Sciences

eawag – aquatic research

USYS TdLab – Department of Environmental Systems Science, ETH Zürich

I2S – Integration & Implementation Sciences

ZTG — Center for Technology and Society, Technische Universität Berlin

INSciTS – International Network for the Science of Team Science