The role/potential of transdisciplinary processes after the Paris 2016 agreement

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Three inputs

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What is (Mode 2) Transdisciplinarity (Td)?

2 Role(s) of science in Td processes (before and after COP21)

3 Two options for global Td processes after the Paris Agreement

Objectives of LCS-Rnet

(http://lcs-rnet.org/about_lcsrnet/; retrieved Sept. 5, 2016)

science

oriented

political oriented

- Promotion of information exchange and research cooperation that cover various issues relating to low carbon societies,
- Promotion of understanding about LCS through dialogues between researchers and various stakeholders including policymakers, businesses, citizens and others to share national and sub-national visions on low-carbon societies, and
- Contribution to international policy-making processes on climate change including G8 process by providing research outcomes and recommendations.

The use of sustainability as a regulative idea and the Differentiation of Tasks/and Roles for SDG

Sustainability is conceived as a regulative idea of social order (Kant, 1781, Schneidewind et al. 1997).

A minimum systemic definition of sustainability reads (Laws et al., 2004; based on interviews with 21 project leaders of the AGS – MIT, ETH, Chalmers, University of Tokyo)



Laws, D., Scholz, R. W., Shiroyama, H., Susskind, L., Suzuki, T., & Weber, O. (2004). Expert views on sustainability and technology implementation. *International Journal of* Sustainable Development and World Ecology, 11(3), 247-261.

Kant, I. (1881). Immanuel Kants Kritik der reinen Vernunft. Riga: Hartknoch.

Schneidewind, U., Feindt, P. H., Meister, H. P., Minsch, J., Schulz, T., & Tscheulin, J. (1997). Institutionelle Reformen für eine Politik der Nachhaltigkeit: Vom Was zum Wie in der Nachhaltigkeitsdebatte. *GAIA*, 6(3), 182-182.

¹ Transdisciplinarity: a mode of science-practice collaboration

"Normal Science Methods" of Sc-Pra-Intera.	"Interactive" Methods of Sc-Pra-Interact.				
Applied research/science	Transition research				
a. Theme/topic centered interaction	 Transformative science (normative) 				
b. Team sciences	 Transforming science (process oriented 				
Consultancy	Mode 2 transdisciplinarity (since 1970)				
a. Commercial (e.g., medicine, engineering,)	1. "Contemplative Mode 1 Td"				
b. Political consultancy/advocacy	2. Zurich 2000 approach				
Knowledge transfer (Science shops)	3. Postmodern transdisciplinarity				
Mediation and consensus building	4. Charta of (spiritual) transdisciplinarity				
Grassroots politics research	Action research (since 1946)				
Translational research	a. Actionistic (shallow) action research				
(since 1915: "bench to bedside)	b. Deconstructive action research.				
	c. Inductive action research				
(Field-based) Ethnographic research	d. Participatory action research				
(Methodology)	e. Experimental action research				
Participatory observation	f. Community-based participatory action				
	research				
Open Innovation	Real-Laborforschung				
	Public participation (e.g., Planning cell)				
	Triple Helix				
z & Steiner, 2016	Citizen Science				

Transdisciplinarity in a nutshell

Transdisciplinarity

- Has become a third mode (methodology) of doing and utilizing science (in sustainable transitioning)
- Means going beyond sciences (not only beyond disciplines) and switching from doing science for to science with society
- Start from an ill-defined, complex, socially relevant problems
- Include(s) three types of processes
 - i. a targeted interdisciplinary process
 - ii. a moderated processes of stakeholder discourse or mitigation
 - iii. a facilitated process of relating science and practice

Follow(s) four functions

- 1. Capacity building (for scientists and practitioners)
- 2. Consensus building, primarily on what is the "problem"
- 3. (Analytic) Mediation, i.e., anticipatory management of losses and benefits of (sustainable) transitions/transformations
- 4. Political legitimation
- Is based on mutual learning by relating and/or integrating different epistemics
 - Dimensions of integration: (1) disciplines, (2) subsystems, (3) modes of thought, (4) interests/perpectives, and (5) cultures
- Asks for theory-practice discourses with equal rights when accepting the otherness (of roles and knowledge) of the other which can be best realized by co-leadership
- Provide socially robust orientations (not solutions) which are of interest for practice and sciences
- Is an important way for strategic sustainable planning



There are three main processes in a (Mode 2) transdisciplinary process on sustainable transitioning



Scholz, R. W., & Steiner, G. (2015). The real type and the ideal type of transdisciplinary processes. Part I - theoretical foundations. *Sustainability Science*, **10**(4), 527-544.

Td-projects realize coleadership on all levels of the project The example of Global TraPs (global phosphorus management)



Scholz, ETHZ





Datta, UNEP



Keyman, Keytrade



Ferroni, Syngenta



Tirado, Greanpeace

Key practitioners who participated

	Science			Practice					
			Scholz, ET	Project TH Zürich	• Roy, IFDC				
				Steering	ommittee				
McDanie Schneide Institute Shiroyan Swilling, 3	ls, U ewind na, U Stelle	BC Vancouver d, Wuppertal niversity of Tokyo enbosch University			 Datta, UNEP N.N., Mosaic Ferroni, Syng Keyman, Keyi Pandey, FAO 	enta Foundatior trade	• N.N., USGS • N.N., Mining	** Con	npany
				Adv	ors				
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				Man	gers				
			Ulrich, ETH	H Zürich	Hellums, IFD0	C			
				Local Coordi	ating Group				
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Organizational Chart of the Global TraPs Project (August 2004)

A much discussed issue In what way are scientists legitimized to political action?



Some consider science to be a public good and differentiate between scientists and (democratically) legitimized stakeholders

- Differentiation of roles
- Differentiation between knowledge and values

Others postulate "SDGs serve as a new narrative that describes the necessary change processes; they offer a comprehensive framework for coordinating sustainable development efforts and strategies at regional, national and international levels, and for integrating them in a shared vision of a globally just and much less resource-intensive world society." (Schneidwind et. al, 2016, p. 124)

In what way are scientists legitimized to political action?



In the Zurich 2000 conception scientists are a public good



Where may be the role of transdisciplinary processes after COP21?

There may be a shift of frontiers/tasks

- ONGOING INQUIRY: From search on who contributed how much to climate change to what contribution for mitigation should be given by whom
- RESILIENCE: What threats is a warming planet facing to who can theoretical provide what contribution
- JUSTICE: From intergenerational justice (how does temperature change) to intragenerational justice (who has to contribute how much)



What does COP 21 change?

Various Articles define "tasks for Td-processes"

- A global social contract/quantitative goals (Art 2(a))
- Request for national assessment for mitigation (Art 4.9)
- Regional economic organizations and (negotiation) processes among the parties are ..."responsible for its emission level" (Art 4.18)
- "Intencitivize and facilitate participation ..." (Art 6(b))

The call for transdisciplinary processes is given in Art 7.5

 Parties acknowledge that adaptation action should follow a country-driven, gender-responsive, participatory and fully transparent approach, taking into consideration vulnerable groups, communities and ecosystems, and should be based on and guided by the best available science and, as appropriate, traditional knowledge, knowledge of indigenous peoples and local knowledge systems, with a view to integrating adaptation into relevant socioeconomic and environmental policies and actions, where appropriate.

Two examples for prospective Global Transdisciplinary Processes for LCS

1. Crosscultural leaning about efficient and socially accepted CO2 emission reduction in different countries

 Reducing fossile energy life-cycle costs of housing (from construction via heating/airconditioning and behavior of users to destruction) – "a little 'cross'-cost-benefit like"

 Critical industries strategic sustainability learning in global transdisciplinary processes (such as Global TraPs) – Where is consensus what direction to move necessary

- Airplane producers and airlines (e.g., prerequisites of a hydrogene fuel cell future
- Car industry on infrastructure of electric and hydrogene fuel cell infrastructure/supply

Roland W. Scholz · Amit H. Roy Fridolin S. Brand · Deborah T. Hellums Andrea E. Ulrich *Editors*

Sustainable Phosphorus Management

A Global Transdisciplinary Roadmap