

Transdisciplinarity in Practice

Experience from a Concept-based Research Programme Addressing Global Change and Sustainable Development

Our twelve-year North-South research programme aimed at better understanding global change and contributing to sustainable development in local to regional contexts. As this required collaboration among numerous disciplines, work with non-scientific stakeholders, and time for learning, we designed a long-term, flexible, and participatory research approach that followed a clear concept, was responsive to changing environments and theories, allowed us to translate findings for policy and practice, and produced effective outcomes. For us, these qualities are the main elements of transdisciplinarity.

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The Swiss National Centre of Competence in Research (NCCR) North-South was an interdisciplinary and international research programme that dealt with global change and sustainable development in various contexts of the Global South and North (Hurni et al. 2010). It enabled a multitude of projects to be conducted in nine regions on four continents, involving some 1,250 individuals in more than 150 institutions located in 40 countries and representing over 20 disciplines. The programme's duration of more than a decade (2001 to 2013) provided a unique opportunity to advance the foundations and practice of transdisciplinarity in research for sustainable development (Wiesmann and Hurni 2011). The authors had the privilege of jointly steering, and working within, the NCCR North-South from its creation. Here we summarize some of the programme's lessons learned from the perspective of transdisciplinarity.

Creating Space for Transdisciplinarity in Research for Sustainable Development

From the onset, transdisciplinarity was considered a crucial ingredient for the NCCR North-South's success (Hurni et al. 2004), for two main reasons: 1. the research programme was guided by the triple goal of high-quality research, research-related capacity development, and concrete impact in terms of more sustainable development (WCED 1987), which we used as a multidimensional normative concept requiring societal validation and close science-society interaction; 2. the programme involved up to 24 disciplinary specializations, from social to natural sciences, medicine, and engineering, calling for interdisciplinary cooperation.

In practical terms, addressing sustainability issues in the programme led to questions such as: how can scarce water resources

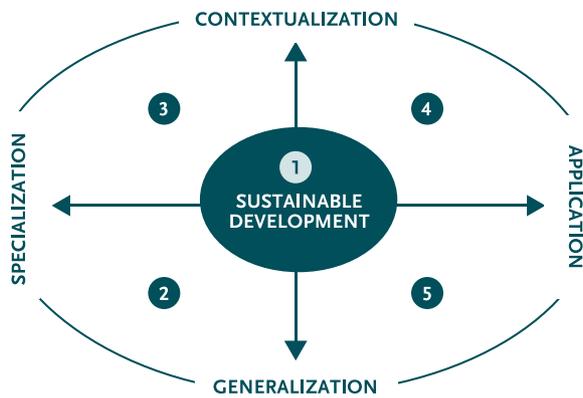
be used more equitably and in an environmentally sustainable way in the highland-lowland systems of Eastern Africa? Or: how can the health of pastoralist populations be improved in arid and semi-arid areas of West Africa as a basis for more sustainable livelihoods? In these two examples, hydrological and medical disciplinary competences were crucial. But sustainability issues had to be taken into account in the specific contexts as well, such as high levels of poverty, economic and power disparities, environmental degradation processes, and weak institutional arrangements. The complexity and factual uncertainties governing the contexts required the iterative involvement of a broad range of disciplines in increasingly interdisciplinary research. Sustainability issues were not only factually complex but also driven by conflicting values and stakes; power-sensitive interaction with concerned populations and stakeholders proved to be essential already in the phase of formulating the research issues, and later on in data collection – for example, in participatory hydrological monitoring – in order to build trust and ownership for a knowledge-based search for solutions. In both cases, sound disciplinary analysis, interdisciplinary integration, and transdisciplinary interaction led to innovative and practical solutions for more sustainability, such as the participatory formation of water governance bodies (Kiteme and Wiesmann 2008) >

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	RESEARCH COMPONENTS	CAPACITY DEVELOPMENT	OUTCOMES
1	integration and synthesis	integrative competence in core institutions	enhanced research for sustainable development and transdisciplinarity
2	research projects in thematic groups	scientific skills at PhD and post-doc levels	contributions to global issues and debates
3	regional research in areas with common case studies	institutional competence in regional networks	contextualization of research and development
4	testing of products and approaches by local actors	communication skills between science and society	transformative knowledge and practices
5	products for policy and practice	development expertise	sustainability-oriented development discourses and policies

FIGURE: Orientations of research for sustainable development that were used to structure and package the approach and components of the *NCCR North-South* (based on Wiesmann et al. 2011 and *NCCR North-South* 2009).

and the introduction of the *One Health* approach linking human and veterinary medicine in pastoralist contexts (Zinsstag et al. 2006).

Transdisciplinarity in the *NCCR North-South* played an important role at all phases of research, from problem identification to finding solutions. At the same time we sharpened our concept of transdisciplinarity (cf. Ukowitz 2014), defining it not as a new meta-discipline, but as a specific mode of knowledge production that transcends the boundaries between scientific disciplines and paradigms, as well as between science and concerned societies. We experienced that transdisciplinarity is most effective when it is built on well-defined disciplinary contributions and is conducted as a reflexive research process that iterates between different modes of knowledge production. This understanding is congruent with the definition provided in the *Handbook of Transdisciplinary Research* (Hirsch Hadorn et al. 2008), and elaborated in the book's synthesis chapter (Wiesmann et al. 2008). In addition, the insight that research is shaped by researchers' specific social, economic, and institutional settings was sharpened by the experience of the radical differences between these settings, in particular between the Global South and North. Consequently, we realized that the principles of research partnerships defined by the Swiss Commission for Research Partnerships with Developing Countries (KFPE) (1998) could benefit from the experience garnered in the *NCCR North-South* (KFPE 2012).

A Concept to Reduce Complexity

Our guiding question was: what knowledge-based contributions can the *NCCR North-South* make to more sustainable development in the Global South and North? The normativity and high complexity of sustainable development posed major challenges

for operationalizing research. We developed a simple framework to structure the approach and package the components of the *NCCR North-South* (see figure).

Five Spaces for Practising Transdisciplinarity

The five orientations of the framework provided five spaces for targeting concrete outcomes in research, capacity development, and policy and practice:

- 1. Integration:** Going beyond the concept of the German Advisory Council on Global Change (WBGU) of “syndromes of global change” (WBGU 1996), we developed an understanding of “syndrome mitigation” based on operationalizing the normative concept of sustainable development; this led to a broadly-based joint agenda setting at the onset of the programme in 2001 (Messerli and Wiesmann 2004).
- 2. Research projects:** The bulk of the nearly 2,500 scientific publications, of which over 20 percent were peer-reviewed, resulted from numerous research projects grouped around three thematic nodes, supported by an integrative training concept, and guided by the joint agenda setting.
- 3. Regional nodes:** In nine regions encompassing 40 countries, regional coordination nodes were established. These became crucial for partnership-based agenda setting, scientific coordination, contextualized training, policy and practice activities, and as pivots for increasing South-South collaboration. For us, failure to secure this Swiss-inspired, high-quality, and global institutional network beyond the life-span of the programme is a negative highlight of the programme.
- 4. Pilot actions:** This component gave researchers the opportunity to embark on more than 100 pilot projects to test their findings with local stakeholders, aiming to achieve concrete

development impact based on co-produced knowledge. Besides leading to concrete positive outcomes, this component was key to advancing transdisciplinary practice.

- 5. Policy and practice:** In this component specific products targeting policy and practice at global and regional scale were produced with professional support. Among other outputs, over 60 policy briefs were disseminated through science-policy forums in the regions, often with a direct impact on policies.

Three Success Factors for Transdisciplinarity

In our view, the success of the *NCCR North-South* in terms of disciplinary – and even more so transdisciplinary – achievements is rooted in three factors: 1. the duration of the programme enabled the recursive process needed to create ownership and outcomes within science and at the science-society interface; 2. the flexible but concept-driven approach enabled disciplinary research to remain the programme's backbone of competence for achieving scientific breakthroughs; 3. the programme's activities were guided by the conviction that a well-established balance between cooperation and competition bears the highest potential for innovation – a position that may conflict with mainstream scientific ideology, where highest innovation potentials are sought in atomized competition. In our eyes the *NCCR North-South* was a unique chance to advance the foundations and practice of transdisciplinarity, and we sincerely hope that it will not remain an exception: may other research programme formats be found (and funded) that also fulfil these three factors of success.

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