Towards bridging disconnects between real-world laboratory and disciplinary research

The effects of this year’s extremely hot summer, which can be empirically attributed to human-made climate change (IPCC 2023), have once again highlighted that humanity is facing fundamental challenges threatening the integrity and even the future existence of human-environmental or social-ecological systems (Rockström et al. 2023). At the same time, the recently published report of the German Council of Experts on Climate Change (Expertenrat für Klimafragen 2023) clearly states that policy measures in Germany to address this challenge are insufficient. In addition, there is a growing demand from various sectors of society for science to actively contribute to solving these challenges, rather than merely describing them.

Against this background, transdisciplinary and transformative research practices have been increasingly called for and established since the early 2000s. Based on the objective – originally formulated, for example, in Mode 2 research (Gibbons et al. 1994, Nowotny et al. 2001) and post-normal science (Funtowicz and Ravetz 1993) – to generate not only scientifically, but also socially robust knowledge, these research practices provide a key foundation for the development of a variety of formats and research settings with an experimental and action-oriented character. Besides sustainable and urban living labs (Liedtke et al. 2015, Voytenko et al. 2016), urban transition labs (Nevens et al. 2013), and transformation labs (Pereira et al. 2020), citizen science approaches have also been linked to transdisciplinary research and investigated for their transformative potential (von Gönner et al. 2023, Agnew et al. 2022). Members of the NaWis network have been actively engaged in developing, promoting, and refining such approaches, particularly in the context of real-world labs (RwLs) as settings for transdisciplinary and transformative research practices.

RwLs as research settings build on real-world experiments as core research methods with the aim to initiate social learning processes for sustainable development and create a space for continuous learning for transformation (Caniglia et al. 2020, McCrory et al. 2022, Schäpke et al. 2018, Wanner et al. 2018). Over the last decade, much effort has been made to methodologically sharpen the RwL concept. This includes defining the core characteristics of RwLs (Schäpke et al. 2018, Wanner and Stelzer 2019, Parodi and Steglich 2021), develop-
ing and testing appropriate methods for research and collaboration (Defila and Di Giulio 2019, Di Giulio and Defila 2018, Wanner et al. 2018), and defining success factors (Bergmann et al. 2021) as well as evaluating the impact of RwL research1.

While there is general agreement that the basic idea of transdisciplinarity is to enable mutual learning processes among different knowledge domains, including different disciplines, and to generate new scientific insights in addition to contributions to solving or mitigating societal problems (Jahn 2008), RwL research often remains largely disconnected from more traditional, disciplinary research outside inter- and transdisciplinary sustainability research. In many of these disciplines, however, key challenges of RwL research have long been recognized and addressed: various disciplines have developed comprehensive methods, strategies, communication tools, and skills to deal with the

The LinkLab working group: Objectives and procedure
This is where the LinkLab working group comes in. Following repeated calls from international science networks – including Future Earth – for more transdisciplinary research formats to strengthen sustainability, an interdisciplinary DKN (German Committee Future Earth) working group comprising nine core members is being set up within the framework of Future Earth to work closely together on a defined topic. The LinkLab working group brings together researchers from a variety of disciplines, including spatial and planning sciences, ethics and epistemology, legal studies, design research, digital participation and data science, anthropology and ethnology, and social-ecological systems research. Some of these disciplines have strong overlaps with RwL research, but may differ in the methods and approaches they use. For example, spatial and plan-

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demanding task of not only collecting data “objectively”, but also interacting closely with practice partners and societal stakeholders during and as part of the research process. Others have specialized in issues related to legal, ethical, or normative implications of research processes, interventions, and knowledge transfer. At the same time, RwLs have great potential to enrich disciplinary research through their specific approaches and methods. Thus, there is a need for a comprehensive understanding of the perspectives and potentials that a greater integration of these approaches and methods offers for both real-world lab research and disciplinary research. Such a deeper understanding seems to be a suitable starting point to enable fruitful mutual learning processes.

1 A special issue of GAIA on impacts of RwLs on sustainability transformations is planned for 2024.
Implications for research and policy to enable impactful, rigorous, and inclusive RwL research.

Further steps and invitation to collaboration

The substantive work of LinkLab is guided by these core aspects of research. The aim is to produce a series of concrete outputs targeted at both the scientific community and policy makers, including a peer-reviewed research article and a policy paper. Draft versions of both documents will be discussed in-depth at the national level with the scientific community and political stakeholders within the group’s network. Insights from the working group will also contribute to shaping the national and international landscape of transformative and transdisciplinary research and related activities, for example on the national level through the network of RwL research and the recently founded Socie-

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References


LinkLab aims to establish a permanent network for exchange on relevant research and policy implications to enable effective, rigorous, and inclusive real-world lab research.


