

Transdisciplinary learning in Real-World Laboratories to foster sustainability transformation

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Transdisciplinarity as a research practice enables solution-oriented mutual learning processes between scientists from different disciplines as well as relevant actors from other societal domains. The aim here is to both (i) contribute to solving fundamental sustainability problems and at the same time (ii) gain new scientific insights. Learning plays a crucial role both in sustainability science in general and in transdisciplinary sustainability research in particular. Therefore, in my presentation, I will first present a framework to conceptualize transdisciplinary learning at the individual, group/organizational, and societal levels. Furthermore, I will introduce real-world laboratories as research settings in which transdisciplinary learning can be realized and outline core characteristics of this innovative transdisciplinary research format.

Following these conceptual foundations, I will present concrete insights into our real-world lab research related to: (i) *real-world experiments* as a central methodological approach; (ii) *accompanying research* to identify success factors and prepare cross-case analysis; and (iii) *project-based learning* in higher education for competence development.

Finally, I will offer some reflections on the challenges of real-world laboratory research and transdisciplinary sustainability research in general, and outline relevant areas for further advancement of this research setting and practice so that they can realize their full potential for promoting sustainability transformations.