

Transdisciplinarity – just a Buzzword? Overcoming some Popular Objections to Transdisciplinary Research

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At first glance, transdisciplinarity currently seems to be supported by many scientific institutions. Transdisciplinary research is expected to overcome the barriers between the disciplines in order to solve real-world problems without being restricted to disciplinary perspectives and research interests.

However, in contrast to such claims and expectations, scientists who actually try to conduct transdisciplinary research experience considerable obstacles to their scientific approach and their applications for funding. Which reservations and objections to transdisciplinary research do many members of the scientific community have and what are the reasons for their reservations? How could these reservations be answered? Which ones are justified, which ones are unfounded? Which changes in the scientific institutions could be helpful – or even necessary – to overcome structural obstacles to transdisciplinary research?

We discuss several objections that have repeatedly been put forward in the debate on transdisciplinary research. These objections are:

- *"Transdisciplinarity is not clearly defined but is a buzzword without any serious content."*
- *"Transdisciplinary is nothing new and not different from inter- or multidisciplinary."*
- *"Research outside of the scientific disciplines leads to a decrease of research quality."*
- *"Transdisciplinary projects tackle practical problems but not scientific problems."*
- *"There are no criteria for assessing the quality of transdisciplinary research results – and probably cannot be."*
- *"Science is defined via disciplinary research. Assessing results from transdisciplinary research by disciplinary quality criteria reveals that transdisciplinary research is not high quality research and does not lead to new insights."*
- *"Transdisciplinary research cannot be conducted by single researchers but requires a costly and often unclarified organizational structure."*
- *"Transdisciplinary research is unsuitable for gaining scientific reputation."*

In our presentation, we analyze and discuss these objections in detail. One of the main reasons of the dubious reputation of "transdisciplinarity" is the use of this notion without being aware of the differences between "multi-", "inter-", and "transdisciplinarity". A precipitate and unspecific labelling of projects as "transdisciplinary" that, at a closer look, do not fulfill well defined criteria of "transdisciplinarity" in fact makes "transdisciplinarity" a buzzword. There are crucial differences between "multi-", "inter-", and "transdisciplinarity"; otherwise, introducing a new word "transdisciplinarity" would not only be useless but confusing.

Accordingly, the first requirement for a positive understanding of transdisciplinarity is that the word "transdisciplinarity" is specified by plausible and transparent criteria, if possible by the involved researchers themselves. Here, we use a concrete definition of transdisciplinarity that we have presented elsewhere (Jaeger and Scheringer 1998): First, transdisciplinary research deals with scientific problems derived from "real-world problems" which do not fit into the system of scientific disciplines (e.g. environmental problems). Second, transdisciplinary research is characterised by a four-stage process of problem solving: (i) transition from the real-world problem to a scientific comprehension of this problem and identification of main questions; (ii) subdivision of the whole problem into sub-problems with well defined interrelations; (iii) free choice of scientific methods adequate for each of the sub-problems, including a transfer of methods from their original field of application to the new context (*trans-disciplinary* use of methods); (iv) re-combination of the solutions obtained for the sub-problems to an answer to the entire problem, guided by the relations between the sub-problems that have been defined in the first step.

Based on this definition and on our experience from several transdisciplinary research projects, we demonstrate how the objections listed above can be dispelled. Most of the eight items can be driven away by considering the difference between trans-, inter- and multidisciplinary (Figure 1), by explicitly defining transdisciplinarity as a scientific research methodology and by demarcating this definition from unspecific use of "transdisciplinarity" just as a jingle of words for promotion purposes.

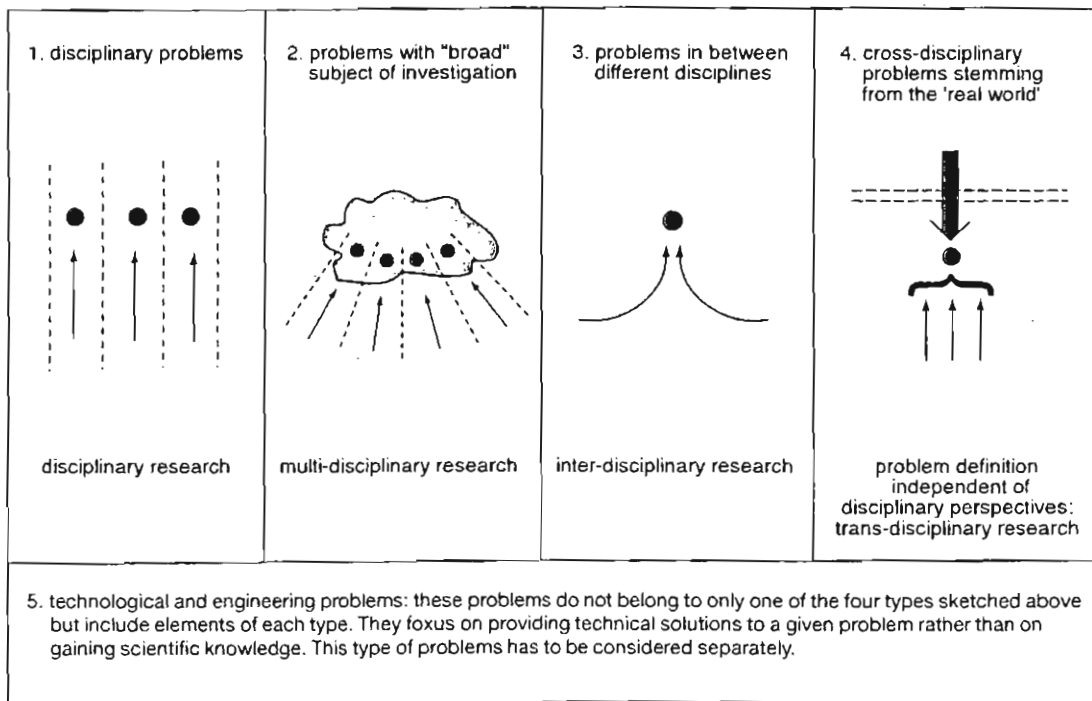


Figure 1: Distinction of five types of scientific problems. →: discipline, ○: scientific problem, - - -: boundaries between disciplines, = = =: boundary between scientific system and 'real world' (from: Jaeger and Scheringer, *GAIA* 7 (1998): 10–25).

In order that an unclear or even misleading usage of the notion of transdisciplinarity can be avoided, we recommend a clarification with respect to the following issues:

- Transdisciplinarity should be understood as a methodological framework for sci-

entific research. Such a framework can be specified by transparent criteria and, on this basis, transdisciplinary research is distinguished from and related to disciplinary, multidisciplinary and interdisciplinary research.

- To be reliable and transparent, transdisciplinarity requires a problem solving process based on scientific methods and according to established peer review criteria such as appropriate definition of the problem, technical quality, conclusiveness of solutions, clarity of presentation etc. In many cases, transdisciplinary research yields fruitful insights also from disciplinary points of view.
- A specific aspect of the methodology-oriented understanding of transdisciplinarity is that transdisciplinary research is characterized by methodological criteria but not by a particular research subject. This is a main difference between transdisciplinary research and disciplinary research, the latter being characterized by the subjects of investigation and the methods that are typical for a particular discipline. Accordingly, successful transdisciplinary research cannot be based only on a methodology of transdisciplinarity but also requires a thorough understanding of suitable disciplinary methods and the existing research in the field of investigation.

Furthermore, transdisciplinarity should be clearly demarcated from vague and misleading interpretations:

- Transdisciplinarity does not mean "communicating the results of scientific research to the general public" which is an important but different task independent of the research process itself.
- Transdisciplinarity is not a management strategy for research managers but provides a methodology of original, cross-disciplinary, and problem-oriented research (Jaeger and Scheringer 1999).
- Transdisciplinarity does not mean the embedding of disciplinary research results into a more general framework but requires a problem-oriented approach that defines the way of investigation already at the very beginning.

Based on this understanding of transdisciplinarity, it can be shown that transdisciplinary research has a strong potential of contributing to the solution of complex and urgent problems such as environmental pollution, increasing traffic problems, landscape fragmentation, or the task of turning to a sustainable energy supply system. Such problems do not fit into the established system of scientific disciplines, which has been emphasized for many years by several authors, e.g., H. v. Hentig (1971), U. Beck (1986), J. Mittelstraß (1989), E. Becker (1993), and H. Albrecht (1994). Therefore, these tasks stemming from the 'real world' have to be recognized as a particular type of scientific problems and should be distinguished from other types of scientific research tasks (as shown in Figure 1). However, this requires some structural changes in the scientific institutions that should help to improve the conditions of transdisciplinary research. In our presentation, we discuss some ideas for such institutional innovations.

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