

Towards a Publication Culture in Transdisciplinary Research

Over the past few decades, many researchers have concluded that adequately addressing issues in the knowledge society requires a major transformation of research, away from disengaged disciplines toward socially engaged, transdisciplinary approaches. To date, knowledge exchange between transdisciplinarity researchers via academic publications has been modest. Developing a common strategy about which journals are appropriate for publishing different insights from transdisciplinary research is a task for scholars and journal editors to undertake jointly. Publishing transdisciplinary research requires both an extension and a transformation of classical scientific publishing.

Christoph Kueffer, Gertrude Hirsch Hadorn,
Gabriele Bammer, Lorrae van Kerkhoff,
Christian Pohl

The core assumption of transdisciplinary research¹ is that research questions and practices need to be framed according to life-world problems rather than disciplinary frameworks. This requires a number of adaptations in the research process, such as collaborating across scientific disciplines and integrating knowledge from heterogeneous sources (cf. Pohl and Hirsch Hadorn 2006). Thereby, transdisciplinary research contributes to and is influenced by both its academic and life-world contexts. This article focuses on knowledge exchange within the academic context² as mediated by scientific publications. We argue that transdisciplinary research would strongly benefit from a more formalised publication culture.

We concentrate on publishing because it is the primary vehicle for sharing research methodologies and results, as well as for making personal experiences and insights gained in the course of the research available to others. Publishing provides a foundation

for critical reflection, learning, and for improving the state of the art. It brings transdisciplinary scholars in touch with each other and enables the growth of a “college” of peers. Therefore, publishing is the backbone of transdisciplinary research, as well as of traditional disciplines.

However, in contrast to traditional disciplines, the relevance of any particular piece of transdisciplinary work to any particular journal is often unclear, with the result that transdisciplinary scholars often find it hard to know where to target their work. While the need for transdisciplinarity has been identified repeatedly by scholars with very different backgrounds, knowledge exchange and collaboration between such researchers have remained modest (e. g., Bammer 2005). Thus, even though there is a growing number of publications labelled as “transdisciplinary” (figure 1), these do not reflect all relevant research activities, nor do they form a cohesive body of literature capable of supporting rigorous theoretical development and widespread learning.

The objective of this article is to initiate discussions about a shared publication culture in transdisciplinary research, in order to advance transdisciplinarity, enhance its visibility and recognition, and strengthen its quality. We propose a typology of journals that illustrates the challenge of creating a transdisciplinary research publication culture, and put forward three propositions to move these discussions along.

First Steps towards a Publication Culture in Transdisciplinary Research

Over the past few years we have compiled online bibliographies of journals and documents that are relevant to transdisciplinary research.³ They currently cover more than 500 journals and several thousand articles. To our knowledge, these are the only comprehensive databases of such journals.⁴ The databases show that there is a broad array of journals that publish transdisciplinary research, covering fields as diverse as environmental research, geography, public health, life sciences, pedagogy, arts, humanities,

Contact: Dr. Christoph Kueffer | td-net | Swiss Academies of Arts and Sciences | Schwarztorstr. 9 | 3007 Bern | Switzerland | Tel.: +41 31 3104094 | E-Mail: kueffer@env.ethz.ch
also: Environmental Philosophy | Department of Environmental Sciences | ETH Zurich | Zurich | Switzerland

Prof. Dr. Gertrude Hirsch Hadorn | td-net | Swiss Academies of Arts and Sciences | Bern | Switzerland | E-Mail: hirsch@env.ethz.ch
also: Environmental Philosophy | Department of Environmental Sciences | ETH Zurich | Zurich | Switzerland

Prof. Dr. Gabriele Bammer | National Centre for Epidemiology and Population Health | ANU College of Medicine and Health Sciences | The Australian National University | Canberra ACT 0200 | Australia | E-Mail: gabriele.bammer@anu.edu.au

Dr. Lorrae van Kerkhoff | National Centre for Epidemiology and Population Health | ANU College of Medicine and Health Sciences | The Australian National University | Canberra ACT 0200 | Australia | E-Mail: lorrae.vanerkhoff@anu.edu.au

Dr. Christian Pohl | td-net | Swiss Academies of Arts and Sciences | Bern | Switzerland | E-Mail: christian.pohl@scnat.ch
also: Environmental Philosophy | Department of Environmental Sciences | ETH Zurich | Zurich | Switzerland

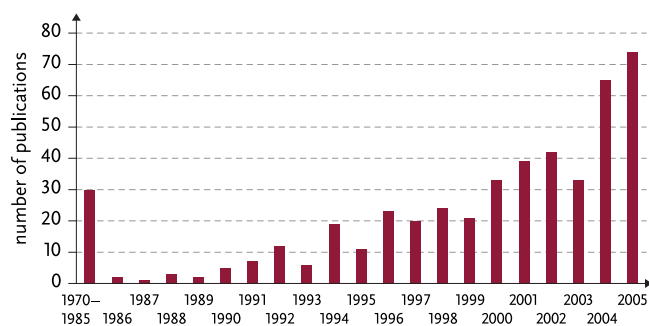


FIGURE 1: Number of publications per year that include the keyword “transdisciplinary” or “transdisciplinarity” in the title, keywords, or abstract (search performed through *Web of Science* on October 12, 2006). Between 1970 and 1985, only zero to five publications appeared per year, resulting in 30 in total.

social and policy sciences, action research, science and technology studies, technology assessment, engineering, design studies, or management sciences.

While such databases start to attenuate the problems raised earlier, these alone are not enough. In particular, we urge transdisciplinary scholars and journal editors to develop a common strategy about which journals are appropriate for publishing which insights from transdisciplinary research, and to identify gaps in the existing array of journals. We propose a typology based on the journals in our databases, in order to initiate such discussions among authors, editors, and referees.

A Typology of Journals

To understand the roles played by different journals that publish transdisciplinary research, we classified them according to three dimensions:

1. *Problem-oriented* versus *practice-oriented* journals: This dimension distinguishes between journals that publish problem-oriented knowledge and those that focus on research practice knowledge (figure 2).
2. *Discipline-based* versus *transdisciplinary-focus* journals: Some journals start with a disciplinary base but concentrate on publishing applied and multidisciplinary papers, and sometimes also inter- and transdisciplinary research. We classify these as “discipline-based” journals. Other journals have their genesis

1 In this article, we use the terms “transdisciplinarity” and “transdisciplinary research” to refer to heterogeneous intellectual endeavours that have, for instance, also been labelled “post-normal”, “mode 2”, “integration and implementation sciences” or “interdisciplinary problem solving”.

2 Knowledge exchange between science and the life-world context – encompassing a range of interactions between actors from within and outside of academia – lies beyond our concern here.

3 www.transdisciplinarity.ch and www.anu.edu.au/iisn (accessed January 22, 2007).

4 Others, such as researchers involved in the German research programme *Social Ecological Research (SÖF)*, have subsequently used and adapted these databases. See www.sozial-oekologische-forschung.org/de/786.php (accessed January 22, 2007).

in the transcendence of disciplines and transformation of research approaches; we categorise them as specialised “transdisciplinary-focus” journals. We argue that both types of journals are important for transdisciplinarity.

3. *Broad-scope* versus *narrow-scope* journals: Within both of the first two dimensions we differentiate further between “narrow-scope” and “broad-scope” journals; we argue that this is critical for a transdisciplinary research publication culture. Narrow-scope journals focus on specific approaches and research questions, e.g., ecological economics or action research, while broad-scope journals concentrate on broad issues such as environmental research or transdisciplinarity in general.

We developed these categories iteratively by examining the journals in our two databases and taking a “first cut” at the important differences. We then tested the resulting matrix (see table, p. 24) against some journals we knew well. The selection of journals listed in the table is meant to be illustrative and is restricted to those particularly relevant for the environmental sciences as this is the predominant area of our experience and expertise. For simplicity we put each journal in only one category, although some could arguably be classified in two or more. In the following, we use selected examples to illustrate the proposed typology.

- **Problem-oriented journals** predominantly publish empirical and theoretical knowledge about a societal problem field. We identified *AMBIO*, *Conservation Biology*, *GAIA*, and *Ecology and Society* as problem-oriented because they are mainly concerned with environmental issues. We classified *AMBIO* and *Conservation Biology* as discipline-based journals because of their roots: *AMBIO* is a publication of the Royal Swedish Academy of Sciences and is embedded in disciplines like geology, me-

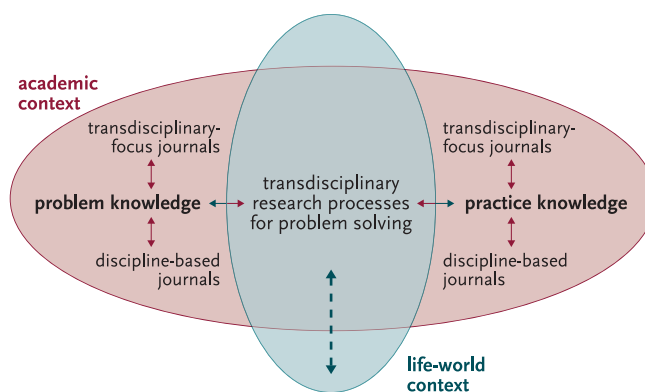


FIGURE 2: Transdisciplinary research processes contribute to and are influenced by both the academic context (horizontal oval) and the life-world context (vertical oval). The interaction with the life-world context (participatory research, mutual learning, communities of practice) is indicated by the dashed arrow. This article focuses on scientific publications that mediate the knowledge exchange within the academic context (horizontal arrows). Transdisciplinary research may exchange knowledge on the object (*problem*) or the research practice of transdisciplinary research (*practice*). The resulting *problem-oriented* and *practice-oriented* knowledge may be published either in *discipline-based* journals having their basis in classical disciplines or in *transdisciplinary-focus* journals that aim to transcend disciplines and transform research practice.

teology, and physical geography. As its title suggests, *Conservation Biology* is based in biology. On the other hand, we see *GAIA* and *Ecology and Society* as transdisciplinary-focus journals because they promote research approaches that are not grounded in established disciplines. *GAIA* proclaims itself as “Undisciplined! Science beyond disciplines”⁵ and always includes in its peer-review process a person foreign to the subject who is asked to “determine the transdisciplinarity of the synthesis, relevance in terms of action, and comprehensibility (for a general audience)”. Similarly, *Ecology and Society* defines itself as “integrative” and “accessible to a wide audience”. Among these four journals, *AMBIO* and *GAIA* represent the broad-scope category; *Conservation Biology* and *Ecology and Society* represent the narrow-scope category. While *AMBIO* encompasses the whole environmental sciences, *Conservation Biology* is focussed on the science of nature conservation. Similarly, *GAIA* is a broad environmental journal, while *Ecology and Society* is focussed on adaptive ecosystem management.

- **Practice-oriented journals** predominantly publish material concerned with the methodology and conduct of transdisciplinary research, including general analytical concepts (e. g., systems) and reflexive reasoning. In this class of journals, we categorised *Journal of Mixed Methods Research* and *Group Decision and Negotiation* as discipline-based: The former aims to bring together quantitative and qualitative approaches from established disciplines, while the latter has its basis in computer science, economics, and psychology. In contrast, we classified *Journal of Research Practice* and *Action Research* as transdisciplinary-focus journals since both aim to transcend disciplinary approaches.

Among these four journals, the broad-scope category is represented by *Journal of Mixed Methods Research* that covers a broad range of methods and applications, and by *Journal of Research Practice* that examines research as a type of practice involving a broad sweep of approaches. The narrow-scope category is represented by *Group Decision and Negotiation* that has a specific focus, and by *Action Research* that concentrates on one type of method.

The important overarching point to re-emphasise here is that all of these journals publish transdisciplinary research and therefore potentially contribute to a transdisciplinary research publication culture, as we elaborate below.

What is Needed for an Effective Publication Culture in Transdisciplinary Research?

We present three propositions for enhancing a publication culture in transdisciplinary research. They synthesise our assessment of the current options for publishing transdisciplinary research and outline strategies for facilitating the publication of transdisciplinary research in the future.

Proposition 1: Transdisciplinary research needs a combined strategy of disciplinary extension (“endogenisation”) and transformation (“specialisation”)

In our review and classification of journals that publish transdisciplinary research, we identified two classes of journals: those with roots in the established disciplines and those which aim to tran-

TABLE: A classification of journals that publish transdisciplinary research, based on three dimensions (problem-oriented versus practice-oriented; discipline-based versus transdisciplinary-focus, broad scope versus narrow scope). The selection of listed journals is restricted to those particularly relevant for the environmental sciences, i. e., through their thematic focus or coverage of methods often used in this field. Journals in *red* are discussed in the main text.

	discipline-based		transdisciplinary-focus		
	broad scope	narrow scope	broad scope	narrow scope	
problem-oriented	<ul style="list-style-type: none"> ■ <i>AMBIO</i> ■ <i>Annual Review of Environment and Resources</i> ■ <i>Climatic Change</i> ■ <i>Frontiers in Ecology and the Environment</i> ■ <i>Journal of Environmental Management</i> ■ <i>Risk Analysis</i> ■ <i>Sustainability: Science, Practice, & Policy</i> ■ <i>Sustainable Development</i> 	<ul style="list-style-type: none"> ■ <i>BioSocieties</i> ■ <i>Cities</i> ■ <i>Conservation Biology</i> ■ <i>Ecological Complexity</i> ■ <i>Ecological Indicators</i> ■ <i>Foresight</i> ■ <i>Landscape Research</i> ■ <i>Mobilities</i> ■ <i>Mountain Research and Development</i> ■ <i>Restoration Ecology</i> 	<ul style="list-style-type: none"> ■ <i>Bulletin Interactif du CIRET</i> ■ <i>Environmental Sciences: Journal of Integrative Environmental Research</i> ■ <i>GAIA</i> ■ <i>Journal of Transdisciplinary Environmental Studies</i> ■ <i>Interdisciplinary Science Reviews</i> ■ <i>International Journal of Transdisciplinary Research</i> ■ <i>Natures Sciences Sociétés</i> 	<ul style="list-style-type: none"> ■ <i>City</i> ■ <i>Communication, Cooperation, Participation</i> ■ <i>EcoHealth</i> ■ <i>Ecological Economics</i> ■ <i>Ecology and Society</i> ■ <i>Futures</i> ■ <i>Nature + Culture</i> ■ <i>Organization & Environment</i> 	
	practice-oriented	<ul style="list-style-type: none"> ■ <i>Environmental Impact Assessment Review</i> ■ <i>Journal of Mixed Methods Research</i> ■ <i>Planning Theory</i> ■ <i>Policy Sciences</i> ■ <i>R&D Management</i> ■ <i>Reflective Practice</i> ■ <i>Research Policy</i> ■ <i>Technological Forecasting and Social Change</i> ■ <i>Technovation</i> 	<ul style="list-style-type: none"> ■ <i>Group Decision and Negotiation</i> ■ <i>Journal of Multi-Criteria Decision Analysis</i> ■ <i>Journal of Technology Transfer</i> ■ <i>Knowledge Management for Development Journal</i> ■ <i>Research Evaluation</i> ■ <i>Science Communication</i> 	<ul style="list-style-type: none"> ■ <i>Issues in Integrative Studies</i> ■ <i>Journal of Research Practice</i> 	<ul style="list-style-type: none"> ■ <i>Action Research</i> ■ <i>CoDesign</i> ■ <i>Emergence: Complexity & Organization</i> ■ <i>Journal of Design Research</i> ■ <i>Systemic Practice and Action Research</i>

scend disciplines, which we call “discipline-based” and “transdisciplinary-focus”, respectively. Our first proposition is that both classes of journals are important for the development of transdisciplinarity. Journals that are discipline-based but concentrate on publishing applied and multidisciplinary research, with some inter- and transdisciplinary papers, are more likely to be read by disciplinary experts. This allows insights from transdisciplinary research to feed back on and trigger innovation in disciplinary science. We use the label “endogenisation” of transdisciplinary research into disciplinary arenas for the process whereby transdisciplinary thinking becomes integrated into, and ultimately endogenous to, existing disciplines.

Transdisciplinary-focus journals, in contrast, open up thinking beyond the constraints of disciplinary boundaries and can foster new forms of creativity. We use the label “specialisation” of transdisciplinarity for establishing transdisciplinary research as a research field in its own right that requires specialised research skills, methods, and ongoing methodological development.

Transdisciplinary research is therefore both a valuable extension of disciplinary research – i. e., traditional disciplines profit from insights gained along new research pathways – and a special kind of research that can transcend established disciplines – i. e., new research fields emerge from transdisciplinary research which are not closely linked to traditional disciplines (cf. figure 3). This dual view of transdisciplinarity is one that we have not seen argued elsewhere.

Proposition 2: Fostering the publication of transdisciplinary research in discipline-based journals requires active engagement of both journal editors and transdisciplinary authors

To realise the potential benefits of publishing transdisciplinary research in discipline-based journals, such journals need to be more attractive to transdisciplinary researchers as an outlet for

their work, and the published transdisciplinary research must be relevant to the disciplinary readership. Achieving this requires a combined strategy involving both journal editors and authors.

Journal editors could target transdisciplinary research through special sections or special issues that focus on how the relevant discipline(s) and transdisciplinary research can learn from and strengthen each other.⁶ Editors of discipline-based journals may profit because transdisciplinary research is often an underexploited resource of innovative scholarship that potentially has a wide and long-term scientific impact.

To complement such approaches by journal editors, transdisciplinary scholars need to plan from early on in a transdisciplinary research project how their research interlinks with classical disciplines, and keep track of the disciplinary relevance of their transdisciplinary work. By being particularly attentive to how their transdisciplinary research advances disciplinary thinking they can produce relevant, interesting, and readable papers that will appeal to a disciplinary audience and enhance the disciplinary journal’s standing. In this regard it is necessary to clarify if a particular innovation of transdisciplinary research contributes to problem-oriented or research practice knowledge (cf. figure 2).

Proposition 3: There are gaps in transdisciplinary-focus journals, which, if filled, will facilitate robust transdisciplinary development and the growth of a “college” of transdisciplinary peers

There are specific gaps in the available range of transdisciplinary-focus journals, which is likely to impede the development of innovative, high-quality, and widely applicable transdisciplinary

>

5 www.oekom.de/gaia-english-version.html (accessed January 22, 2007).

6 See further the US National Academies’ recommendations on how journal editors can promote interdisciplinary research (NAS et al. 2005, p. 201).



© Christian Körner

FIGURE 3: Sajama National Park in the Bolivian Andes: Transdisciplinary research on complex societal issues – such as sustainable development in mountain areas threatened by global change – may trigger innovation in disciplinary social or natural sciences. It may also lead to new research pathways beyond classical disciplines. Reprinted with kind permission of Global Mountain Biodiversity Assessment, Basel.

practice. Most of the transdisciplinary-focus journals are problem-oriented, and we particularly note the dearth of practice-oriented transdisciplinary-focus journals. While this is evident from a quick glance at the number of journals listed in each category in the table, the disparity becomes even more stark when we point out that we have presented only a selection of problem-oriented journals, but we have listed all the practice-oriented transdisciplinary-focus journals we are aware of. The lack of practice-oriented journals strongly suggests that there are few options for pushing the boundaries of transdisciplinary research practice, either through sharing lessons learned or proposing and debating new methodological developments. This also makes it harder for transdisciplinary researchers to find each other and to establish a “college” of peers who build on and critique each other’s work, in the process raising the quality and applicability of transdisciplinary methodologies.

There is considerable scope for establishing transdisciplinary-focus journals that set methodology agendas and lead the field. For example, there is as yet no high-ranking *Journal of Transdisciplinary Research Practice* which would provide scope for publishing broadly on transdisciplinary research methods, and promote interaction across a wide range of transdisciplinary researchers. We note, however, that previous attempts to establish broad-scope practice-oriented transdisciplinary-focus journals, such as *Issues in Integrative Studies*, do not seem to have been particularly successful, whereas narrow-scope journals such as *Systemic Practice and Action Research* seem to be flourishing. Closer examination of their histories, along with evaluation of how well these journals meet their aims, is likely to provide valuable lessons for establishing new publication outlets.

Conclusion

These three propositions represent possible steps for creating a more sophisticated and strategic approach to the role of publishing in the development of transdisciplinary research as an important and legitimate research endeavour, as well as building firmer foundations for building skills, methodologies, and practices. Yet taking up these ideas will require shifts in thinking and in commitments on the part of researchers, publishers, reviewers, and perhaps even readers. Establishing a “college” of transdisciplinary research peers may be advanced by more interactive and open formats (e.g., online tools) as part of a transdisciplinary publication culture, as well as by better matching between transdisciplinary research insights and types of journals. For instance, the *Faculty of 1000 Biology* project⁷ may provide a useful model for transdisciplinary research. This online tool allows scientists to recommend highly relevant literature to each other.

As we established in the introduction, this paper does not consider the interaction of transdisciplinary research with the life-world. This is a crucial aspect of transdisciplinary research, and

our setting it aside to focus on academic aspects does not diminish its importance. We each have a shared responsibility to engage with both the academic and life-world issues in order to continue advancing transdisciplinarity, enhancing its visibility and recognition, and strengthening its effectiveness.

References

- Bammer, G. 2005. Integration and implementation sciences: Building a new specialization. *Ecology and Society* 10/2: 6 (online). www.ecologyandsociety.org/vol10/iss2/art6 (accessed January 22, 2007).
- NAS (National Academy of Sciences), NAE (National Academy of Engineering), IOM (Institute of Medicine of the National Academies). 2005. *Facilitating interdisciplinary research*. Washington, D.C.: National Academies Press.
- Pohl, C., G. Hirsch Hadorn. 2006. *Gestaltungsprinzipien für die transdisziplinäre Forschung. Ein Beitrag des td-net*. Munich: oekom. (English version: Pohl, C., G. Hirsch Hadorn. 2007. *Principles for designing transdisciplinary research. Proposed by the Swiss Academies of Arts and Sciences*. Munich: oekom.)

Christoph Kueffer



Born in 1974 in Biel, Switzerland. Post-doctoral fellow at the University of Hawaii and research associate of td-net and the Institute of Integrative Biology at ETH Zurich. He received a PhD in environmental sciences from ETH Zurich in 2006 and was a fellow at Collegium Helveticum in 2000/2001.

Gertrude Hirsch Hadorn



Born in 1953 in Schwäbisch Hall, Germany. Professor at the Department of Environmental Sciences at ETH Zurich. She received her habilitation in philosophy at Konstanz University, a PhD in education at Zurich University and chairs td-net, a forum of the Swiss Academies of Arts and Sciences.

Gabriele Bammer



Born in 1951 in Kapfenberg, Austria. Professor at the Australian National University and research fellow at Harvard University. She was a Fulbright New Century scholar in 2001/2002 and is developing the new field of Integration and Implementation Sciences.

Lorrae van Kerkhoff



Born in 1973 in Sydney, Australia. Post-doctoral fellow at the Australian National University. She received a PhD in human ecology in 2002 and was a Fulbright post-doctoral fellow at Harvard University in 2004/2005. Her current work is examining the role of research in development.

Christian Pohl



Born in 1966 in Windisch, Switzerland. Co-director of td-net of the Swiss Academies of Arts and Sciences and lecturer at the Department of Environmental Sciences at ETH Zurich. He received a PhD in environmental sciences from ETH Zurich in 1999 and was a fellow at Collegium Helveticum from 1999 to 2002.

⁷ www.f1000biology.com (accessed January 22, 2007).