57. How Theory Can Help Set Priorities for the I2S Development Drive

Christian Pohl[1]

When Gabriele Bammer made a presentation about her book *Research Integration Using Dialogue Methods*[2] at the 2009 international transdisciplinarity conference in Berne, Switzerland, the audience reaction was highly charged. The heated discussion was not, however, about the book, but that Gabriele had introduced it as a first book of methods for a new discipline. Some people were strongly challenged and somewhat upset by the idea. They insisted that a transdisciplinary or I2S discipline was a contradiction in terms and therefore impossible. In their view, transdisciplinary or I2S research is always a collaborative effort bringing together different disciplines and experts from various societal sectors who engage in a process of co-producing knowledge. So how (for heaven's sake) could such collaborative processes be delegated to a specific discipline?

I did not expect that reaction and was puzzled by it, as I believe Gabriele was also. What deep convictions had been disturbed by the idea of a specialisation in collaborative research processes for policy-relevant research? Was it that the researchers feared that some specialists would take over transdisciplinary research as a whole? Or, that the specialists would always intervene and further complicate the already challenging co-production of knowledge? The discussion was not conclusive, but it was clear that Gabriele had presented an impertinent idea.

It is a pleasure to see how this idea is further elaborated in the present book. Since I have heard a number of Gabriele's presentations, read some of her papers and had discussions with her, I already knew some pieces. Now I can see how they combine to form the universe of I2S.

I2S is positioned as a specific way of doing relevant science. It cuts across issues or sectors like innovation and business, risk and security, health and the environment (see Chapter 32, especially Figure 32.1). Hence, if research in such sectors is to be policy relevant, it must draw on the competencies, methods and practices of I2S. I2S as a discipline is about producing, organising, assessing and transferring knowledge in a system of world views. As the metaphor of statistics

1 Christian Pohl was invited as a 'senior scholar who has pioneered thinking about transdisciplinarity'.
2 McDonald et al. (2009).

suggests, I2S does not interfere with the subject matter, but provides methods to organise knowledge on that specific subject matter in a more relevant way. I found Chapter 31, 'A view of the future', particularly elucidating, starting with the vision of 2025, with the following chapter presenting the discipline and the sub-groups one might belong to: the inner circle, 'Theory and methods'; the second circle, 'Methodological development with respect to a sector'; and the outer circle, 'Application in a specific sector'. Also very helpful is the differentiation between I2S team leader, I2S disciplinary specialist and the other researchers and societal actors involved, along with the respective allocations of I2S competencies and tasks, which are presented as the last chapter in each of the previous sections. This allocation helps understanding that not everybody has to know everything or be able to answer all the questions asked; I did not count, but they must number in the hundreds. Instead we are talking about a specialisation in terms of competencies and a division of labour in terms of tasks and responsibilities. Another precondition for being able to address the numerous open questions is what Gabriele calls the I2S Development Drive. It captures the magnitude of the scientific endeavour we are talking about—one that requires big money, a lot of brain power and the engagement of a wide range of scholars.

The background for this commentary is my specific understanding of transdisciplinary research, based on sustainability research in German-speaking European and Scandinavian countries.[3] Like I2S, such transdisciplinary research stands for a particular way of producing knowledge that primarily helps address socially relevant issues, as opposed to knowledge that primarily advances scientific understanding. In transdisciplinary research, academics from different disciplines and civil society actors, along with the private and the public sectors, co-produce knowledge with specific purposes.

> [I]n order to be relevant and useful for societal problem handling, transdisciplinary researchers have to frame, analyse and process an issue in such a manner that
>
> 1. they grasp the complexity of the issue;
> 2. they take the diverse perspectives on the issue into account;
> 3. they link abstract and case-specific knowledge;
> 4. they develop descriptive, normative, and practical knowledge that promotes what is perceived to be the common good.[4]

3 Bunders et al. (2010).

4 Pohl (2011, p. 620); Hirsch Hadorn et al. (2010, p. 432).

The collaboration of disciplines with societal actors is a means to meet these four purposes. In the same way that Gabriele has done for I2S, we have described the specific challenges transdisciplinary research is exposed to, as well as the methods it might use, in *Principles for Designing Transdisciplinary Research*,[5] the *Handbook of Transdisciplinary Research*[6] and in *Methods of Transdisciplinary Research*.[7] We are all part of the same Development Drive and believe in the big project—namely that transdisciplinary or I2S research can be done better compared with the present state of knowledge production, in the sense of better integrating different forms of knowledge and providing knowledge that is more relevant to and useful for specific societal actors; and that the knowledge of how to better co-produce knowledge can be formulated in methods and tools, which can be stored and taught.

Gabriele discusses some of the differences between I2S and transdisciplinary research in Chapter 33. One is the emphasis given to understanding and managing diverse unknowns—something that clearly distinguishes I2S and transdisciplinary research. Our approach to unknowns is less direct and more procedural. We consider the results and recommendations produced in a transdisciplinary research process as preliminary. Any attempt to bring results to fruition has to be understood and designed as an 'experimental implementation'[8] or a 'real-world experiment'.[9] Hence, the process of knowledge co-production does not end by making recommendations or producing policy briefs. Rather the effects that such recommendations and policy briefs have on society or policy have to be further studied and analysed for surprises. Surprises indicate uncertainties and unknowns in the underlying understanding of how the recommendations will change things. Therefore the transdisciplinary research process as a whole has two additional research phases not found in disciplinary research: a phase of joint problem framing and a phase of bringing results to fruition, each requiring money, time and brain power.[10]

A second difference, which Gabriele does not discuss, is the pragmatic approach of I2S and the more theoretical approach of transdisciplinary research. I2S is a radically pragmatic approach in the sense that every method or concept described is assessed under the question of what is its use for

1. synthesising disciplinary and stakeholder knowledge
2. understanding and managing diverse unknowns

5 Pohl and Hirsch Hadorn (2007).
6 Hirsch Hadorn et al. (2008).
7 (*Methoden transdisziplinärer Forschung*) Bergmann et al. (2010).
8 van den Daele and Krohn (1998).
9 Gross and Hoffmann-Riem (2005).
10 Pohl and Hirsch Hadorn (2007).

3. providing integrated research support for policy and practice change?

I2S is a storehouse for concepts, methods, case examples and guides (as described in Chapter 2, especially Figures 2.1 and 2.2). As far as I understand, there is no further theoretical background, for instance, of what co-production of knowledge between science and society means or how disciplinary and societal actors are distinguished and included in the research process. This apparent difference attracts my attention because there is lively discussion about the theoretical understanding of the transdisciplinary research process.[11]

What is such a theoretical understanding good for? The main effect is that a theory simplifies the world by reducing its complexity. It increases our awareness of some aspects while making others less important. This is different from a storehouse's shelves embodying a matrix of three domains and five questions. Shelves call for completion, for filling all empty spaces with concepts, methods, case examples and guides. Theory, on the other hand, places emphasis on those aspects deemed relevant by the theory. (There is, however, the danger that the theory is wrong and attention is given to irrelevant aspects.)

To give an example: in our work on transdisciplinary research for sustainable development, we conceive different disciplines or stakeholders as thought collectives that look at an issue 'through the eyes' of a specific thought style.[12] The academic thought collectives are disciplines like biology, medicine or sociology. Within society we distinguish three further thought collectives: civil society, the private and the public sectors.[13] Further, we understand the thought collectives' significance for co-producing policy-relevant knowledge as a question of the thought collectives' expertise, power and interests in relation to any particular issue.[14] This simple theorising results in the following question to be addressed at the beginning of any project: what thought collectives from academia, civil society, the private and the public sectors are relevant for our project's contribution to sustainable development in terms of their expertise, power and interests? This question makes the research manageable.

There are further orientations given by the simplifying theory. One is what Gabriele calls 'achieving congruence between the methods used across the three domains' (Chapter 27). A theory of what is happening in the processes of co-producing knowledge will make the selection of concepts and methods more congruent (even though there is no guarantee they are on the right track).

11 Carew and Wickson (2010); Jahn (2008); Pohl (2011); Stauffacher et al. (2008).
12 Fleck (1986a, 1986b).
13 Pohl and Hirsch Hadorn (2007).
14 Wuelser et al. (2012).

Another orientation is that theories of co-producing knowledge might link some of the numerous questions that have to be dealt with separately in Gabriele's storehouse of concepts, methods, case examples and guides. For example, in our theoretical understanding we do not handle values separately from viewpoints or perspectives. Values are part of any thought collective's particular thought style and are expressed in how they frame an issue. In our approach, taking values into account, along with harnessing and managing differences, becomes an integral part of integrating thought styles. For instance, how a problem is framed and what is seen as an adequate solution always depend on the particular thought style and its underlying values. According to requirement (4) of the definition of transdisciplinary research presented earlier, the question of how a specific solution promotes the common good is an explicit task to be addressed and deliberated on by the research team. Again this is different from I2S, where 'the creation of public value' is something additional to have in mind to minimise 'the temptations to compromise research integrity' (Chapter 26).

A theory, furthermore, helps to identify the next steps. For instance, the question of how to assess and justify knowledge claims of thought collectives becomes an issue in co-production of knowledge. In academic collectives this is done by peer review. And how do non-academic thought collectives assess and justify their knowledge?

Another crucial next step is how, in practice, to integrate or synthesise the knowledge of thought collectives. Here we are back to the pragmatic question of how to do better transdisciplinary and I2S research, which is where the interests and expertise of transdisciplinary research and I2S strongly overlap. The challenge of integration will also answer the question of whether or not a specialisation in transdisciplinary research and I2S is needed. The specialisation makes sense if it makes co-production of knowledge in addressing societal concerns more effective and efficient. What specialists have to come up with are methods and tools, and successful applications in real processes of co-producing knowledge. To achieve this specialists have to be familiar with the methods and tools and have to understand the challenges of any specific situation of knowledge co-production. If I had $1 million to spend it would be on the methodology that assigns methods to problem types, funding the (daring) scholars who explore the methods and tools in co-production processes; however, in selecting the most relevant problems of integration, I would use a theory of co-producing knowledge to get an idea of what empty spaces in the storehouse's shelves are the most relevant to fill with concepts, methods, case examples and guides.

Contributed November 2011

References

Bergmann, M., Jahn, T., Knobloch, T., Krohn, W., Pohl, C. and Schramm, E. (2010). *Methoden transdisziplinärer Forschung: Ein Überblick mit Anwendungsbeispielen*. Frankfurt am Main: Campus Verlag.

Bunders, J. F. G., Broerse, J. E. W., Keil, F., Pohl, C., Scholz, R. W. and Zweekhorst, M. B. M. (2010). 'How can transdisciplinary research contribute to knowledge democracy?'. In: 't Veld, R. J. (ed.). *Knowledge Democracy: Consequences for science, politics, and media*. New York: Springer, 125–52.

Carew, A. L. and Wickson, F. (2010). 'The TD wheel: a heuristic to shape, support and evaluate transdisciplinary research'. *Futures*, 42 (10): 1146–55.

Fleck, L. [1947] (1986a). 'The problem of epistemology'. In: Cohen, R. S. and Schnelle, T. (eds). *Cognition and Facts: Materials on Ludwik Fleck*. Dordrecht: Reidel, 79–112.

Fleck, L. [1947] (1986b). 'To look, to see, to know'. In: Cohen, R. S. and Schnelle, T. (eds). *Cognition and Fact: Materials on Ludwik Fleck*. Dordrecht: Reidel, 129–51.

Gross, M. and Hoffmann-Riem, H. (2005). 'Ecological restoration as a real-world experiment: designing robust implementation strategies in an urban environment'. *Public Understanding of Science*, 14: 269–84.

Hirsch Hadorn, G., Hoffmann-Riem, H., Biber-Klemm, S., Grossenbacher-Mansuy, W., Joye, D., Pohl, C., Wiesmann, U. and Zemp, E. (eds). (2008). *Handbook of Transdisciplinary Research*. Dordrecht: Springer.

Hirsch Hadorn, G., Pohl, C. and Bammer, G. (2010). 'Solving problems through transdisciplinary research'. In: Frodeman, R., Thompson Klein, J. and Mitcham, C. (eds). *The Oxford Handbook of Interdisciplinarity*. Oxford: Oxford University Press, 431–52.

Jahn, T. (2008). 'Transdisziplinarität in der Forschungspraxis'. In: Bergmann, M. and Schramm, E. (eds). *Transdisziplinäre Forschung. Integrative Forschungsprozesse verstehen und bewerten*. Frankfurt Campus: Verlag, 21–37.

McDonald, D., Bammer, G. and Deane, P. (2009). *Research Integration Using Dialogue Methods*. Canberra: ANU E Press; <http://epress.anu.edu.au/dialogue_methods_citation.html>

Pohl, C. (2011). 'What is progress in transdisciplinary research?'. *Futures*, 43: 618–26.

Pohl, C. and Hirsch Hadorn, G. (2007). *Principles for Designing Transdisciplinary Research—Proposed by the Swiss Academies of Arts and Sciences*. München: oekom Verlag.

Stauffacher, M., Flueler, T., Krutli, P. and Scholz, R. W. (2008). 'Analytic and dynamic approach to collaboration: a transdisciplinary case study on sustainable landscape development in a Swiss prealpine region'. *Systemic Practice and Action Research*, 21 (6): 409–22.

van den Daele, W. and Krohn, W. (1998). 'Experimental implementation as linking mechanism in the process of innovation'. *Research Policy*, 27: 853–68.

Wuelser, G., Pohl, C. and Hirsch Hadorn, G. (2012). 'Structuring complexity for tailoring research contributions to sustainable development: a framework'. *Sustainability Science*, 7 (1): 81–93.

Brief Biography

Christian Pohl is Co-Director of the transdisciplinarity-net of the Swiss Academies of Arts and Sciences and Senior Research Fellow at the Department of Environmental Sciences at ETH Zurich (Swiss Federal Institute of Technology Zurich). He has a PhD in environmental sciences and has investigated uncertainty in environmental assessments, as well as undertaking a comparative analysis of the collaboration of natural and social sciences in Swiss and Swedish environmental research. His current research interest is the analysis and design of transdisciplinary research as a means to connect science and society, specifically in the field of sustainable development.

This text is taken from *Disciplining Interdisciplinarity: Integration and Implementation Sciences for Researching Complex Real-World Problems*, by Gabriele Bammer, published 2013 by ANU E Press, The Australian National University, Canberra, Australia.