Analysis

Conflicts in Transdisciplinary Research: Reviewing Literature and Analysing a Case of Climate Adaptation in Northwestern Germany

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ABSTRACT

Transdisciplinary research has been introduced as an approach to integrate different bodies of knowledge to learn and to develop solutions towards socio-ecological transformations. In these concepts, broad stakeholder involvement is intended to promote knowledge integration, consensus formation and activation of local actors to initiate and advance learning and change processes. In doing so, however, transdisciplinary processes enter societal battlegrounds and meet conflicting interest and knowledge claims. Thus, building on the discussion on transdisciplinarity in the context of sustainability-related research, the paper seeks to understand when and why which types of conflicts emerge in sustainability-related transdisciplinary research, how they affect knowledge integration, and how they can be resolved. It develops a categorization of conflicts including differing values, conflicting interests, dissimilar claims of legitimacy, and diverse knowledge claims. They are applied empirically in the analysis of a project on regional adaptation to climate change in Northwestern Germany. It studies processes and outcomes with regard to the societal impact of the project and discusses experiences of conflicts and relevant solutions. The paper finds that societally relevant transdisciplinary research processes need to be prepared for conflict resolution and overcoming resistance and blockages in cases when consensus formation and mutual agreement is not attainable.

1. Introduction

Transdisciplinary research is gaining support and is growing particularly in the field of sustainable development and environmental problem solving (Brandt et al., 2013). It can broadly been defined as "a reflexive, integrative, method-driven scientific principle aiming at the solution or transition of societal problems by differentiating and integrating knowledge from various scientific and societal bodies of knowledge" (Lang et al., 2012, p. 6f.).

Based on traditions in the philosophy of science calling for a revocation of the purely instrumental function of science in society and of the growing specialisation in sub-disciplines, the discourse on transdisciplinary research builds on several epistemological strands (Hirsch Hadorn et al., 2008b). In its present form it has largely been shaped by the call for Mode-2 science integrating science and society (Gibbons et al., 1995; Gibbons, 2000), the notion of post-normal science (Funtowicz and Ravetz, 1993; Gallopin et al., 2001), and the rising awareness of the repercussions of scientific-technical work on society (Beck, 1986). Transdisciplinarity has also been nurtured by the unavoidable societal relevance and role of scientific work and scientists themselves as articulated in the science and technology studies (STS) (Jasanoff, 2003, 2004). From these traditions, the focus on crossing

disciplinary boundaries as well as the stronger focus on societally relevant problems and their solutions emerged. Transdisciplinarity is characterised by the focus on complex and often contested societal problems. In the realm of sustainable development these problems can hardly be described, understood or solved through one disciplinary lens alone and require a combination of physical-environmental and social dimensions (Pohl, 2011; Bernstein, 2015). As such, transdisciplinarity developed into a central pillar of the discussion on sustainability science that calls for novel forms of integrative problem-oriented research and science-policy interaction through stakeholder participation and the integration of their diverse forms of knowledge and expertise (Kates et al., 2001; Spangenberg, 2011).

The resulting challenges for scientists and society include the integration of societal stakeholders such as the private sector, the broader public and their respective bodies of knowledge as well as diverse scientific disciplines into the process of generating knowledge (Clark et al., 2005). This form of knowledge integration has been described as central to transdisciplinary research including systems knowledge, target knowledge and transformative knowledge (Hirsch Hadorn et al., 2008b). The rapidly growing body of work in transdisciplinary research (Brandt et al., 2013) developed the notion of collaborative work between researchers and non-academic experts or lay-people further. It

calls for a problem-focused co-operation of scientists with non-academic actor groups in different stages of the research process including problem identification and definition, common research and problem-solving processes as well as interactive dissemination and implementation of results (Jahn et al., 2012; Lang et al., 2012; Scholz et al., 2006). The transdisciplinary knowledge-production process is called upon to open up to civil society groups, holders of local lay knowledge, corporations and other stakeholders and involve them in mutual learning processes (Hirsch Hadorn et al., 2008a, 2008b; Pohl, 2011; Wiek, 2007). While this integration has even been strengthened by the notion of "Mode 2 transdisciplinarity" (Scholz and Steiner, 2015a), there is growing recognition of the additional challenges it entails.

The other key element of transdisciplinary research is the focus on developing solutions to societal problems (Lang et al., 2012; Polk, 2015). Through stakeholder involvement, transdisciplinary processes are expected to become more practical and closer to every-day lives of people. Stakeholder and knowledge integration is intended to serve the objective of developing balanced, broadly acceptable and implementable solutions to sustainability problems. Scientists are therefore expected to be more involved with the world outside academia. Vice versa, public and private spheres are thereby increasingly affected or intentionally affected by academic actors and research. In doing so, political and academic domains intermingle and scientists take up societally relevant or even political roles (Jasanoff, 2004) with entirely new forms and dimensions of contestation and conflict. Since many issues in transdisciplinary sustainability-related research are contested and in this sense political by nature, research processes enter into conflicts. In contrast to often violent political conflicts (Jeong, 2008), in transdisciplinary processes conflicts can be understood as competition, opposition or (non-violent) struggles among actors based on differences in values, interests, and knowledge claims. However, even though most of the literature on transdisciplinary research calls for the involvement of stakeholders into research practice, there seems to be little recognition of the potential conflicts and pitfalls these approaches entail for achieving the goals of transdisciplinary research (van den Hove, 2006; Voss and Bornemann, 2011).

This is even more surprising since the debate on environmental conflicts and justice figures prominently in ecological economics (Martinez-Alier, 2003) and in environmental social sciences at large (e.g. Diehl and Gleditsch, 2001; Redpath et al., 2013). These strands of literature start out from the assumption of latent or open conflicts in many environmental issue areas and develop notions how to address or resolve them. However, thus far little interaction between these discussions and the transdisciplinarity discourse could be observed.

This paper, therefore, seeks to systematically understand when and why which types of conflicts emerge in sustainability-related transdisciplinary research, how they affect knowledge integration and societal problem solving, and how they can be resolved. Starting out from a systematic review of the transdisciplinarity literature in Section 2 asking whether and how conflicts have been addressed in the empirical and conceptual literature on sustainability, the paper identifies different types of conflicts that can emerge in participatory transdisciplinary processes. These categories will then be employed to analyse conflicts in a case study of a transdisciplinary project on regional climate adaptation (Section 3). Here, I study which types of conflicts emerged and why as well as which solutions have been found to deal with them. Section 4 discusses the findings of the case study in relation to the larger transdisciplinarity literature and Section 5 draws some conclusions.

2. Conflicts in Transdisciplinary Research - A Literature Review

2.1. Methodology

Documented through a growing body of literature there is an

increasing understanding in the scholarly community on the relevant mechanisms and pitfalls of stakeholder participation in general and in transdisciplinary research concerning sustainability challenges in particular. This section, therefore, embarks on a review of the literature on transdisciplinary research in sustainability science. It attempts to identify whether conflicts are an issue in the literature and which types and origins of conflicts have been identified in conceptual and empirical work and what solutions to the conflicts have been found. Through this review, this paper seeks to identify distinct types and related causes of conflicts in sustainability-oriented transdisciplinary research processes that either hinder knowledge integration and mutual learning of different parties or block the transfer from knowledge to action and practical solutions.

To gain an overview how salient the issue of conflicts is in the relevant literature, the review started out with a web search in bibliographic databases, namely *Scopus* and *Web of Science* considering the period 1960 until May 2018. In Web of Science, the search category "Topic" was used whereas in *Scopus*, the search category was "Keywords". The search used the keywords "transdisciplinary research", "transdisciplinary" as well as "transdisciplinarity" as first-tier search items. In a second step, the keywords "conflicts" and "sustainability" were combined with the first-tier keywords in both databases. Zooming into the key topic of this paper, a further search applied the keywords "conflicts and sustainability" together with the main keywords as combined search items. Other related terms like "obstacles" or "challenges" had been left out because of the specific focus on conflicts among actors that constitute a stronger form of social contestation than almost omnipresent "challenges". In Scopus, the search processes focussed on keywords of articles whereas in Web of Science, the search processes focussed on topics. In addition to the database search and the selection of the thematically relevant papers, the review included author-selected papers that are central to the transdisciplinary debate, but did to not appear in the keyword-search.

Based on the numeric overview of the search terms, a qualitative analysis combining systematic and traditional review methodologies (Haddaway et al., 2015; Petticrew and Roberts, 2006) has been conducted. It looked into the abstracts and full texts of all the papers that were found to be of topical relevance searching for the mentioning or analysis of conflicts and different types of conflicts in sustainability-related transdisciplinary research processes. These contributions to the debate were analysed based on a qualitative analysis with the goal to identify relevant types of conflicts in transdisciplinary research and their specific causes.

2.2. Numerical Results

The initial web search produced a total amount of 52 articles from both bibliographic databases, Scopus and Web of Science. After deducing identical papers that appeared in both databases, in total 35 papers remained (see Annex 1). The analysis of the abstracts of these papers identified 12 papers that systematically addressed conflicts in sustainability-related transdisciplinary research and/or discussed solutions to the conflicts. The author-based selection based on a snowball-search added another 18 thematically relevant papers that address conflicts or closely related topics in transdisciplinary research.

As indicated in Table 1, the bibliometric search in central publication databases showed that the vast sustainability-related transdisciplinarity literature thus far only reluctantly addresses conflicts. This reluctance is particularly striking given the significance of conflicts as described in the few sources available in this respective literature. Also considering the broad literature on environmental conflicts (e.g. Adams et al., 2003; Martinez-Alier, 2003; Paavola, 2007), the transdisciplinarity literature appears to be overly optimistic about the ability of its approach to avoid or overcome conflicts. In other words, there is an apparent gap in this literature with regard to embracing and thoroughly studying conflicts in transdisciplinary processes.