

Tracking the traces of transdisciplinarity – Establishing the societal impact perspective in the discussion of the added value of transdisciplinary research cooperations

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Abstract: *The following four theses, to be discussed in the workshop, emanate from an assessment of the transdisciplinary research cooperation on sustainable rural development in Switzerland ('ETH-UNS Case Study Appenzell-Ausserrhoden'): [Thesis 1]. The societal impacts of transdisciplinary research cooperations need to be taken into account when the added value of this research mode is to be understood; [Thesis 2]. Societal impacts can be expected on a problem-related level and an inter-personal level; [Thesis 3]. The interplay of both societal impact levels facilitates a real-world application of the research findings; [Thesis 4]. Societal impacts emerge continuously in the course of the research process.*

Keywords: *Transdisciplinary research cooperation, societal impact, added value, ETH-UNS case studies*

Introduction

Transdisciplinarity represents a research mode that is targeted on the integration of differing paradigms, problem perspectives and objectives in the research process. The integration refers to both researchers from different disciplinary backgrounds (typically expressed by the term 'interdisciplinarity') and representatives of non-academic groups that hold a stake in the phenomenon or problem under research (cf. Defila and Di Giulio, 1998; Pohl and Hirsch-Hadorn, 2007). Transdisciplinary research strives for establishing active collaborations among the different groups represented in the research project within the entire research process, which means from (i) defining the research problem, the objectives and the proceeding, across (ii) driving the process of research, including the sensemaking of findings, toward (iii) the dissemination and possible implementation of the findings (cf. figure 1). By collaboratively sharing the responsibility and monopoly of definition and interpretation, transdisciplinarity research goes beyond traditional participatory research approaches in which a disciplinary core group of researchers surveys and consults representatives of other societal groups, as it is typically the case in empirical social research.

So far, the outcome of transdisciplinary research is mainly defined and explored from an academic perspective, focussing on the scientific impact of transdisciplinary research (e.g. Defila and Di Giulio, 1999). As the above definition of transdisciplinarity suggests, transdisciplinary research is particularly characterized by the participation of non-academic stakeholders in the research process. Therefore, also the issue of the non-academic, societal impacts needs to be raised. Given the additional resources that are required to accomplish a participatory, collaborative interaction, the question of the societal impact of transdisciplinary research is not least a question of credibility and legitimacy of this research mode.

The four theses on the societal impacts of transdisciplinary research that are put up for discussion in this paper emanate from an assessment of a major transdisciplinary research project in the field of sustainable rural development in Switzerland. The transdisciplinary project, the so called ETH-UNS case study in the Swiss Canton Appenzell-Ausserrhoden (Scholz et al., 2002; Scholz et al., 2003; Scholz et al., 2006) aimed at developing orientations for local decision-making with respect to a long-term development of the rural economies in line with existing and future socio-ecological needs. In

total 188 non-academic individuals have been collaborating with 100 academic individuals (including 74 master students) over a period of four years (2000-2004). The study of the societal impacts of this project has been based on qualitative interviews with key stakeholder as well as a larger scale quantitative inquiry, in terms of questionnaires and statistical analytics (factor analysis, mediation analysis), addressing all accessible non-academic participants (52% return rate, cf. Helgenberger, 2006; Walter et al., 2007). The study focused on the immediate and indirect impacts of the research collaboration process on the non-academic participants of the ETH-UNS case studies.

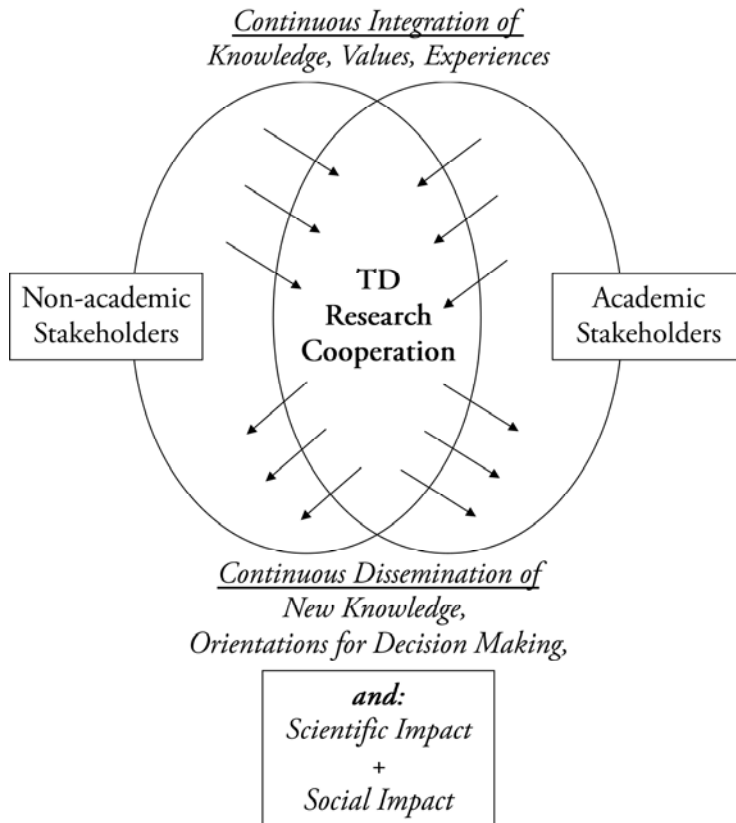


Figure 1. Transdisciplinary integration, dissemination and impacts.

The societal impacts of transdisciplinary research cooperations need to be taken into account when the added value of this research mode is to be understood

Transdisciplinary research cooperations between academic and non-academic (practice) actors are considered as an *agora* for mutual academic and practical learning (cf. Scholz et al., 2000; Nowotny et al., 2001). In contrast to pure academic research that is motivated to lead to scientific impacts, transdisciplinary research can be expected to additionally trigger societal impacts among the addressed non-academic community.

As a matter of fact, science has been always expected to eventually hold contributions for the non-academic world, which in turn provides the academia with the resources necessary for their tasks. However, the collaborative character of transdisciplinary research and the resulting immediate and mutual communication among academic and non-academic actors open up new dimensions of impacts on the non-academic community. This argument is supported by taking in a resource perspective: Those participating in transdisciplinary research process are expecting some kind of return for their invested time – this holds true for both academic and non-academic participants. Successful transdisciplinary research projects, basing on a strong commitment and involvement of different societal stakeholder groups, therefore become more likely when an added-value for these groups can be expected. The resource argument can be also transferred to the perspective of

research funders: participative research approaches demand more resources than research, taking place in a homogeneous community basing on similar paradigms and therefore require less time and financial resources to carry out negotiating research goals, procedural and methodological principles as well as the framing of research outcomes (cf. Helgenberger, 2009). In order to justify the additional expenses, an added value of these expenses needs to be demonstrated. Taking into account the societal impacts of transdisciplinary research, in addition to contextualized academic findings, allows substantiating respective arguments.

By convention, scientific impacts appear as soon as scientific knowledge and ideas that have been produced in the research process are incorporated in subsequent research processes, which become apparent through citing these works. Indices like the *Science Citation Index* (SCI) have been developed to operationalise the scientific impacts of research that can be also applied to transdisciplinary research. However, despite its importance only limited efforts have been made so far to address the societal impact of transdisciplinarity research (e.g. Bergmann et al., 2005). The research project, this contribution is based on (Helgenberger, 2006; Walter et al., 2007), therefore has been specifically targeted to explore and identify the societal impacts resulting in the course and in the aftermath of the transdisciplinary ETH-UNS case study (Scholz et al., 2002; Scholz et al., 2003).

Societal impacts can be expected on a problem-related level and an inter-personal level

Research on the societal impacts of the transdisciplinary ETH-UNS case study revealed societal impacts on a problem-related and an inter-personal level. Societal impacts on a problem-related level refer to a changed approach of non-academic participants to the problem under study – both in terms of their perception of the problem (problem awareness, problem-solving competencies) and their interactions (personal commitment for problem-solving, dissemination of knowledge, gained from the research collaboration, cf. figure 2).

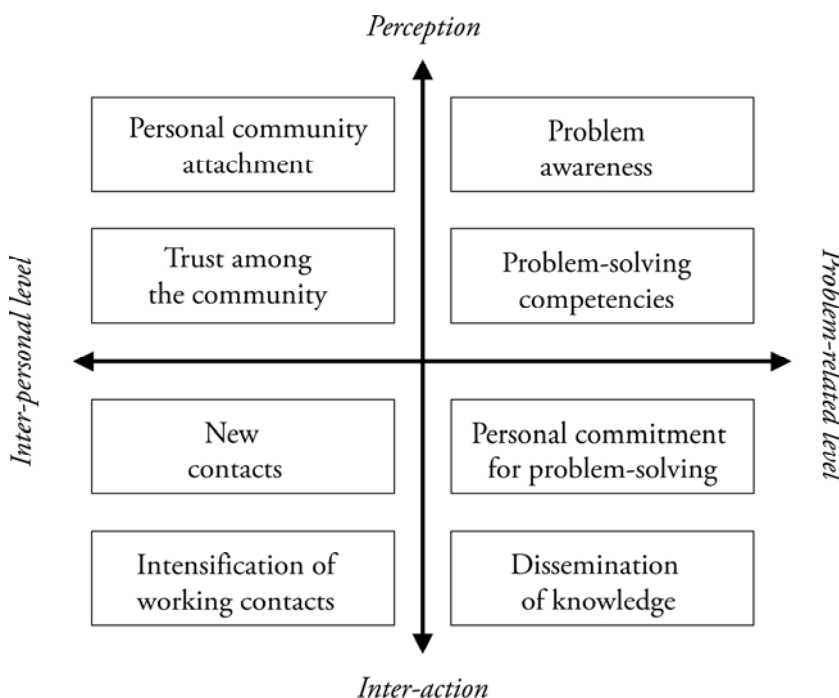


Figure 2. Societal impacts of transdisciplinary research.

The collaborative efforts in the course of the transdisciplinary project also had consequences for the inter-personal relations among the non-academic participants. On the perceptual level, the intensive interactions increased the participants' personal identification and attachment with their local community and increased the level of trust among the local stakeholders. With respect to the

interactions of local stakeholder in terms of tackling the problem under study, the transdisciplinary collaboration resulted in networking effects (establishing new contacts and intensifying existing contacts in the context of local community involvement).

The interplay of both societal impact levels facilitates a real-world application of the research findings.

Interviews with non-academic participants of the ETH-UNS case study suggested that their involvement in the process resulted in effective consequences on their decision-making in terms of tackling the problem under study. The quantitative inquiry provided indications that the application of research findings in terms of decision-making processes had been mediated by societal impacts of both problem-related and inter-personal levels (Walter et al., 2007). This finding suggests that activities by local stakeholders to tackle existing problems in their communities were influenced by their changed approaches to the problems, linked to community building and networking in the course of the research collaboration.

The plausibility of the assumption on the interplay of societal impacts is substantiated by the social science literature on the foundations of human behaviour. In his works, Ajzen (e.g. Ajzen, 2002) explains behaviour by an interplay of behavioural beliefs on the consequence of potential actions, normative beliefs on others' expectations towards one's actions control beliefs on factors, enabling or inhibiting a certain course of action. With respect of the perception level of societal impacts Ajzen's three dimensions of belief link to the identified impact constructs (behavioural belief: problem awareness, problem-solving competencies; normative belief: trust among and personal attachment to the community; control belief: problem-solving competencies, trust among the community).

The resource perspectives of social and human capital, in addition, offer theoretical frameworks to explain how the interplay between the problem-related level and the inter-personal level of the identified societal impacts facilitate local action. Burt (1997) holds that human capital and social capital represent complementary resources, allowing for action. Human capital refers to individual ability, while "social capital is a quality created between people" and refers to opportunity (Burt 1997). In this respect the problem-related societal impacts refer to traits of individuals that can be framed in terms of human capital. In contrast, societal impacts on the inter-personal level have implications on the social relationships within a community, resulting in opportunities of action. The interplay of these two complementary levels eventually facilitates both individual and joint activities for local problem-solving.

Societal impacts emerge continuously in the course of the research process

In contrast to scientific impacts that typically appear in the aftermath of a research project when the results have been made accessible to the broader scientific community by publications, societal impacts appear over the whole course of transdisciplinary collaboration. This thesis is based on the empirical findings from the analysis of the ETH-UNS case study. Non-academic stakeholders participated in the ETH-UNS case study in varying degrees of involvement (information, consultation, equal collaboration) and periods of time (from singular contacts up to four years of continuous interactions). The analysis of the societal impacts of the ETH-UNS case study revealed that the intensity of collaboration, resulting from the degree and period of involvement, positively influenced the social impacts of the research process. This finding suggests that these impacts successively develop in the course of the process of continuous integration of knowledge, values and experiences and of continuous dissemination of new knowledge and orientations for decision making (figure 1). The finding substantiates earlier assumptions on the recursive, continuous effectiveness of transdisciplinary research (Pohl and Hirsch-Hadorn, 2007).

Concluding remarks

The theses emanate from experiences with a major transdisciplinary research project in the field of sustainable rural development. Albeit farmers have been involved as non-academic stakeholders in the ETH-UNS case study, they only represent one among other local perspectives that had been represented in the project. To what extent do the four theses on the societal impacts of transdisciplinary research that have been put up for discussion in this paper contribute to development processes in the context of organic farming?

Transdisciplinary research approaches in the field of agriculture can be expected to have an added value both for science and the non-academic world if research problems are tackled that are (i) complex and multi-faceted and therefore require scientific, inter-disciplinary ways of knowledge generation and that, in turn, require the involvement of (ii) local, societal context knowledge, normative frameworks and development objectives.

The challenges of farms in coping with climate change, by the way of a current example, belong to this type of transdisciplinary research problem. Despite of the existing knowledge on the human triggers and impacts of climate change, the complexity of the involved processes challenges the scientific understanding of local, shorter-term human-climate interactions that are relevant to business planning on the farm-level. The complexity, furthermore, is an obstacle for non-academic decision makers to understand the inter-relation of their decisions and actions with climate change and its impacts.

From a scientific perspective, transdisciplinary research can increase the understanding of local business planning in the context of climate change and provide insights on the types of scientific knowledge, required by farmers to adjust their business planning to the challenges of climate change. From a non-academic perspective, transdisciplinary projects can trigger societal impacts on participating farmers, both on a problem-related and an inter-personal level, that contribute to farmers' capacities to mitigate their impacts on climate change and to adapt to the inevitable local consequences of climate change. If the four theses prove correct, the active participation of farmers in studying business planning in the context of climate change could increase their understanding of the problem as well as potential response options. Their participation, in addition, could result in increasing their local social capital to enable them to implement potential adaptive or mitigating responses. The latter particularly can be expected to be true for small farm sizes that individually do not have access to sufficient resources to carry out major shifts in their business strategies.

Research of the societal benefits of transdisciplinary research is still in its beginnings. However, the above discussion of the theses, related to these benefits, along one particular, current agricultural challenge already provides promising ideas how collaborative research projects could lead to both contextualized scientific knowledge and local capacity building of farmers. Future assessments of ongoing transdisciplinary research in the agricultural field are necessary to increase the understanding of the potential, as well as the limits of this mode of research. The four theses that have been discussed in this paper are thought of as starting points to inspire further explorations of the impacts of transdisciplinary research on non-academic participants and their direct environments.

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