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Balancing divergence and convergence in transdisciplinary research teams

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ABSTRACT

Climate adaptation projects often involve joint knowledge production, including different stakeholders and disciplines. One of the main challenges of transdisciplinary research projects is to balance the convergence and divergence of epistemic contributions. We explore to what extent organisational embedding of project teams, input in the project, and project governance influence project performance in climate adaptation projects. Our results indicate that aligning incentive systems and lower partner diversity lead to higher effectiveness and satisfaction. Project size enhances effectiveness, but decreases satisfaction. Satisfaction is enhanced by committed project members. Furthermore, dealing with diverse partner sets and large teams is not eased by careful management in the course of the project. Careful balancing of divergence and convergence should be taken into account during the design stage of these projects. In the context of knowledge co-production for environmental challenges, project management should proactively consider project structure, required level of partner diversity and project size.

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1. Introduction

For over a decade research on how to adapt to the consequences of climate change has steadily been gaining momentum (Biesbroek et al., 2010; Ford et al., 2011). Finding solutions to these kinds of complex or ‘wicked’ problems requires transdisciplinary or joint knowledge production, taking into account experiential and localised knowledge, integrating different disciplines, and involving a wide range of actors in the research process itself (Nowotny and Scott, 2001; Pohl, 2008). Including traditional knowledge users, like policymakers and companies, contribute to producing legitimised and effective knowledge

and to reconciling supply and demand for knowledge (Sarewitz and Pielke, 2007; McNie, 2007; Boon et al., 2011).

Climate adaptation projects are often positioned at the cross-section of science, policy and practice, which signals the need for including different stakeholders and disciplines in the production of knowledge. Examples of such projects are research on flooding in unembanked areas and health impacts of urban heat. In these projects academic researchers collaborate with people working at non-academic institutes, municipalities, district water boards, companies, etc. In various research systems, knowledge co-production projects concerning climate adaptation have become more prominent. These projects were often shaped in the context of large-scale,

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multi-actor research programmes. Examples include Knowledge for Climate (the Netherlands), KLIMZUG (Germany), and NOAA RISA (US). Despite this increase in prominence, questions remain about success and the management of these kinds of programmes, calling for research on the performance and governance of these kinds of projects. To study this, we looked at climate adaptation projects in the Dutch Knowledge for Climate programme.

Organising knowledge co-production is not straightforward. The management of transdisciplinary research is complex and non-linear due to differences in knowledge backgrounds, normative perspectives, time frames and reward structures (Edelenbos et al., 2011; Hegger et al., 2012a). Although transdisciplinary research projects need to nurture divergence, the project format dictates the intention to generate convergent end products. This article focuses on this balancing act of convergence and divergence of epistemic contributions. The central question is how project and contextual aspects influence team performance in transdisciplinary climate adaptation projects.

To explore this research question and learn more about this balancing act in relation to project governance we use insights from organisation and science studies. Ample research has been done on collaborations in science (cf. Parker et al., 2010) and in the context of projects inside organisations (Hobday, 2000). Studies on networks focus more on intra-organisational networks than on networks between organisations (Ibert, 2004; Provan and Fish, 2007). Most inter-organisational studies, though, focus on whole-network level (Provan and Fish, 2007), interuniversity collaborations (Chompalov et al., 2002) or on temporary organisations working on specific tasks (cf. Bakker, 2010), such as ship-building projects (Levering et al., 2013). Most of the studies do not focus on scientific projects pertaining to a diverse range of actors, disciplines and locations. Our paper adds to the current literature by studying inter-organisational, transdisciplinary projects that aim to govern knowledge diversity in climate adaptation projects. Another contribution of this paper lies in the fact that transdisciplinary projects have been studied conceptually, whereas empirical investigations are rare (Pohl et al., 2010; Hegger et al., 2012b).

To address these issues, we introduce the aspects we focus on first while drafting the theoretical framework (Section 2). The methodological set-up of the article is explained in Section 3, followed by the results (Section 4) and the discussion and conclusions (Section 5).

2. Theoretical framework

2.1. Performance of inter-organisational and transdisciplinary projects

This paper focuses on temporary transdisciplinary, inter-organisational teams consisting of knowledge users and producers coming from different organisations, disciplines and normative backgrounds. These teams work on a project in which the development of new knowledge transcends the boundaries of traditional knowledge producers and users. These transdisciplinary research projects are positioned

between different organisations. The set-up of such a project offers several advantages. First, temporal collaboration between actors with heterogeneous cognitive and normative backgrounds creates room for out-of-the-box learning (March, 1991). Second, from innovation management we know that innovative projects need to be set up separate from the business-as-usual operations. This enhances flexibility and creates a nursery that is not (yet) subject to the hard performance criteria (Jones and Lichtenstein, 2008).

At the same time, compartmentalising activities in an inter-organisational project might lead to challenges, such as alignment of project activities with activities in the participating organisations and communication between project members and their own organisations (Bercovitz and Feldman, 2011). These coordination costs are augmented through the need to combine different epistemic backgrounds.

Using concepts from organisation and science studies, we want to explore the performance of these transdisciplinary projects. Multiple dimensions are proposed to conceptualise project performance. First, De Wit (1988) and Cooke-Davies (2002) perceive effectiveness, i.e. the extent to which its objectives are attained, as the most appropriate criterion for project performance. Kenis and Provan (2009) also used effectiveness to measure project performance in inter-organisational networks. The above indicates the relevance of this dimension, which supports the application of this dimension in the context of transdisciplinary projects.

Second, satisfaction of project members has been regarded as a significant complementary dimension (Kenis and Provan, 2009; Provan and Milward, 2001). Whereas effectiveness signifies goal attainment, satisfaction adds the evaluation of the experience of the process that project participants went through. The differences in organisational backgrounds and the absence of predefined routines to cooperate make these processes potentially complex and cumbersome. By this, satisfaction complements effectiveness, which focuses on direct project outcomes, as a dimension for project performance.

2.2. Factors influencing performance of transdisciplinary teams

Transdisciplinary teams need to nurture heterogeneity and diversity in terms of knowledge, organisations, etc. but at the same time create a univocal product. This can be regarded as part of a balancing act between diversity (divergence) and alignment (convergence). For example, stakeholders and disciplines that participate are diverse but during the project their endeavours need to converge to an end product. In studying the driving forces behind project performance, we want to include variables that cover this balancing act.

In organisational sciences ample research is conducted about the way in which teams are arranged effectively. A wide range of factors is discerned that influence team effectiveness. Stokols et al. (2008) propose contextual factors, such as physical/environmental (spatial proximity), technological (data infrastructure) and socio-political ones. Institutional factors play a prominent role, e.g. in the form of incentive systems, as well as personal ones, e.g. regarding motivations (Brown and Eisenhardt, 1995; Cohen and Bailey, 1997). Team

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