



## Sensitivity in transdisciplinary projects: A case of reindeer management in Finland



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### ABSTRACT

Knowledge integration in transdisciplinary projects can help to achieve a more comprehensive, balanced and relevant understanding of real-world problems and their potential solutions. In this paper, a project on reindeer management in northern Finland, RENMAN, is used to identify and examine some challenges that transdisciplinary projects face regarding knowledge integration and the roles taken by scientists to overcome the challenges as well as to explain why integration has or has not been successful. We identify and examine four challenges to knowledge integration: (1) the need for integration during the design of study questions and settings, (2) the need to manage competitive deliberative settings, (3) the potential mismatch between providing “optimal” policy recommendations and outputs integrating facts and values, and (4) the need to harness the benefits of the process to contribute to managing the problem in the future. Scientist in the RENMAN project used four roles to cope with these challenges: reflective scientist, intermediary, facilitator or capacity builder. Our key argument is that the metaphor of sensitivity can often explain the successes and failures regarding integration pursued by using the above mentioned roles. Sensitivity in transdisciplinary research encompasses attention toward the needs and problem definitions of knowledge holders and knowledge users, respect toward various worldviews, divergent perspectives and forms of knowledge, and the understanding of biases, power relations and possible marginalizations embedded in and resulting from knowledge production. Finally, flexibility to act on the knowledge gained through sensitivity is needed to design evolving processes able to contribute to the resolution of complex real-world problems.

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### Introduction

Current environmental problems are often unpredictable, include multiple stakeholders, values and worldviews, and afford no simple solutions (Carley and Christie, 2000). A typical intractable environmental dilemma involves different formulations of the problem by the stakeholders and different scales of the effects and preferred solutions (Rein and Schön, 1994). The uncertainty inherent in complex problems limits the ability of the sciences to produce objective, valid and reliable knowledge (Funtowicz and Ravetz, 1993). How can scientific efforts contribute to solving such problems?

Scientific disciplines often have a preset variety of possible study questions as well as reliable and valid methods and concepts

considered appropriate for analytical purposes (Klein, 1990; Bruce et al., 2004). Lawrence and Després (2004) note that the shortcomings of traditional research are a logical outcome of the workings of experts who are narrow-sighted and address issues in separation from their societal contexts. It has been claimed that the understanding of real-world complexity requires more holistic approaches and the integration of results produced by various disciplines (Kinzig, 2001). Therefore, the effort to integrate different knowledges has expanded beyond the academic forums to the participation of a number of societal actors. The integration of knowledges aims at producing applicable and socially robust knowledge for environmental decision making in practice (see Gibbons et al., 1994; Nowotny et al., 2001). Transdisciplinarity is an approach emphasizing the integration of disciplines and knowledges of various stakeholders in order to address real-world problems (Klein, 2004b; Pohl, 2011; Glass et al., 2013).

The concept of transdisciplinarity emerged in the 1970s. Initially, a top-down approach was used and the coordination of knowledge integration was managed with no participation from outside of science (Hirsch Hadorn et al., 2008). However, particularly during the 1990s, developments regarding concepts such

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as sustainable development, action research (Whyte, 1991), post-normal science (Funtowicz and Ravetz, 1993), Mode 2 science (Gibbons et al., 1994; Nowotny et al., 2001) and science-policy interface (Van den Hove, 2007) contributed to the stronger inclusion of a variety of stakeholders into transdisciplinary projects. With the enlarging participatory agendas, transdisciplinary approaches evolved toward being a promising avenue for engaging with complex problems focusing on the practical needs regarding stakeholders' dilemmas by integrating diverse knowledges (Klein, 2004b; Höchtl et al., 2006; Hirsch Hadorn et al., 2008). Integration takes place via knowledge co-production processes (e.g., Jasanoff, 2004; Lemos and Morehouse, 2005; Lövbrand, 2011) involving various disciplines and societal actors (Pohl et al., 2010).

The objective of this article is to identify and examine some challenges that transdisciplinary projects face regarding knowledge integration and the roles taken by transdisciplinary scientists to overcome the challenges, and to explain why in some cases integration has been successful and why it has failed in others. The key aim of integration is to achieve a more comprehensive or balanced and relevant understanding of a real-world problem and its potential solutions. In general terms, integration means combining epistemological, conceptual and practical elements that were not related before, and it is one of the core challenges in the co-production of knowledge. Integration aims to produce shared understanding of the problem as well as its causes and solutions, but weaker integration may also take place via finding a common language or mutually understandable boundary objects through which the issue can be discussed (Pohl et al., 2010).

Our key argument is that the metaphor of sensitivity can, in many cases, explain the successes and failures regarding integration. The metaphor of sensitivity implies that somebody is vulnerable and easily hurt. Sensitivity can also mean that someone is sensitive about or has an aversion toward a certain issue. Finally, sensitivity implies being cautious and respectful toward something, e.g., local contexts (Oxford Dictionary, 2012).

We use the RENMAN project ("The challenges of modernity for reindeer management – integration and sustainable development in Europe's Subarctic and Boreal regions" (2001–2004 EU FP5 QLK5-CT-2000-00745)) as a case for examining knowledge integration in transdisciplinary projects. Here we want to emphasize that when we refer to the integration of disciplines in relation to the RENMAN project, we are dealing with disciplinary approaches that maintain the disciplines' identities, methodological and conceptual advancements and perspectives while producing primary knowledge. Thus, we are dealing with secondary integration of knowledges, not transdisciplinary knowledge integration in the strict sense of emphasizing interpenetrative methodologies that transform disciplines toward the hypothetical ideal of a single science. However, the disciplinary study settings and results were complemented by each other. Furthermore, as the RENMAN project placed a strong emphasis on integrating science with reindeer herders' knowledge, we can refer to transdisciplinarity.

We start by outlining our material and methods in second section, and in third section, we proceed to examine some literature on the co-production of knowledge regarding the identified challenges for integration, and introduce the potential roles which scientists can assume in order to overcome these challenges. Section "Background" provides some background on reindeer herding and its management in Finland as well as introducing the RENMAN project. In fifth section, we examine negative and positive issues regarding how scientists used various roles during the RENMAN project to manage the challenges for knowledge integration during co-production processes. In section "Discussions and conclusions", we reflect on what kind of sensitivity the different roles of scientists should have in the co-production of knowledge and in which

phase of the project in order to gain a better possibility of coping with the challenges for integration.

## Materials and methods

The RENMAN project was selected as a case study because it is well-documented (Forbes et al., 2006), one of the authors worked as a researcher in the project consortium, and because enough time has passed since the project in order that it is possible to discuss such issues as its relevance for environmental management in practice. Follow-up of the project is based on extensive following of discussion related to reindeer herding over the past decade, and on some discussions with reindeer herders during other projects in which reference was made to the RENMAN project. The project has been widely documented and thus many of the empirical findings of this paper regarding the integration of stakeholders (especially reindeer herders) were made by Hukkinen et al. (2006) and are attributed to that paper in our analysis part. The theoretical argument of Hukkinen et al. (2006) is mainly connected to developing cognitive potential by creating emergent institutions among a variety of stakeholders. The added value of this paper is that we discuss empirical insights in terms of the literature on the co-production of knowledge to draw conclusions on how the RENMAN project succeeded and failed in integrating knowledge, what roles were played by the scientists in different phases of the project, and how these successes and failures can be explained by the notion of sensitivity. Furthermore, the direct experiences of one of the authors from the project were critically combined with the other papers in RENMAN project book. By "critical" we mean analysing also the shortcomings of the RENMAN project, which were apparent during the project but remain mostly implicit in the collection of papers (Forbes et al., 2006). Furthermore, the project book's epilogue, written by a reindeer herder, provides critical views on how the project was conducted (Magga, 2006).

We analyzed our materials (project publications, experiences about the project, our experience and discussions with the reindeer herders during other projects, public discussion on reindeer management) using the principles of content analysis (Hsieh and Shannon, 2005), trying to answer the following questions: What challenges does the co-production of knowledge face in a transdisciplinary setting regarding knowledge integration, and what roles did the scientists play to overcome the challenges in order to contribute to solving a real-world problem? Our analysis was performed by continuous interaction between empirical findings and insights from the literature on the co-production of knowledge (Davies, 1999).

We started our analysis by identifying the points in time during and after the project when the different actors and knowledges came together. We continued by paying attention to successes and failures regarding integration. Failure means that shared understanding of the problem or its solution did not emerge or even that a common language was not found. Successes encompass the creation of a mutually understandable language to communicate about the real-world problem, or shared understanding. We also paid attention to in which phase of the project these successes and failures occurred. As a result of analysing the materials we identified the following challenges for integration in the RENMAN project as being relevant also to other transdisciplinary projects: (1) the need for integration during the design of study questions and settings (prior to knowledge production), (2) the need to manage competitive deliberative settings (throughout the co-production of knowledge with practitioners and stakeholders, and after primary disciplinary knowledge production), (3) the potential mismatch between providing "optimal" policy recommendations and outputs integrating facts and values (when thinking what kinds of

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