A multi-level perspective on learning about climate change adaptation through international cooperation

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ABSTRACT

International cooperation and learning may accelerate climate change adaptation and help countries and regions to adapt more effectively and efficiently. Recognizing the importance and opportunities for mutual learning and knowledge transfer, international and supranational organizations, such as the European Commission, have put programmes for international cooperation in place. This paper presents and tests a framework for assessing multi-level learning outcomes of such international cooperation processes and the conditions that produce these outcomes. The framework distinguishes between: (1) group learning by individual process participants; (2) organizational learning by organizations represented in the process; and (3) network and societal learning by actors external to the process. We verify the analytical potential of the framework by comparing learning by six partners in an adaptation-oriented European cooperation project. The project scores rather high on group learning with participants learning from and – to a lesser extent – also with each other. Learning by partner organizations varied and was generally less whereas learning by external actors was very limited. The case study confirms our expectation that learning outcomes are produced by combinations of partner-specific, process-specific and process-external conditions. The presented framework and insights can be used to stimulate learning in and from international cooperation processes.

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1. Introduction

In previous decades, the primary response to climate change has been mitigation through the reduction of greenhouse gas emissions. With the increasing evidence of climate impacts occurring, adaptation has climbed political and policy agendas (Biesbroek et al., 2010; Porter et al., 2015). It is now widely recognized that even when mitigation efforts prove to be successful adaptation measures are needed (European Commission, 2013; Preston et al., 2011). Adaptation refers to the "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities" (Parry et al., 2007, p. 869). Adaptation actions are often taken in response to a combination of climate drivers (e.g. a projected increase of extreme weather events) and non-climate drivers (e.g. cost savings) (Moser and Ekstrom, 2010; Tompkins et al., 2010). To accelerate adaptation processes and to adapt more efficiently and effectively, countries and regions may engage in international

cooperation and learning processes. Such processes are heavily promoted and subsidized by international and supranational organizations, such as the United Nations, the World Bank and the European Commission. Also national policymakers recognize the potential to learn from other countries experiences with climate change adaptation (CCA). Yet, they expect that knowledge that has been successfully applied in another country does not need to be equally relevant to their own country (Hanger et al., 2013). This is understandable given that even European countries already differ considerably in terms of the expected impacts of climate change (EEA, 2015) as well as the scope of their adaptation strategies (Swart et al., 2009) and progress made in preparing, developing and implementing national strategies (EEA, 2014). Such differences pose challenges and opportunities to shared knowledge production, knowledge exchange and mutual learning.

Building upon diverse literature streams, this paper presents and validates a framework to conceptualize and assess learning about CCA. Inspired by configurational approaches and methods for Qualitative Comparative Analysis, the framework is organized around three levels of learning outcomes and ten conditions that potentially contribute to producing these outcomes. The framework is designed with an eye on comparing an intermediate number of cases. To validate its potential to conceptualize and

assess learning, the framework is used here to assess learning in a European cooperation project that focuses on adaptation in regional water management. In doing so, we aim to provide a solid basis for further comparative research on learning about CCA. This study particularly addresses the following knowledge gaps. First, while learning is a key subject in the literature on natural resources management, there has been limited attention for the multi-level nature of learning, i.e. the relationship between learning at the individual level and different levels of social organization (Diduck, 2010). Second, given the urgent need for developing response strategies to global change and the emphasis on learning processes, an improved understanding of learning through international cooperation is needed. As the European Commission has financially supported numerous adaptation projects to stimulate international knowledge transfer and learning, a unique dataset has been created that is worthwhile to capitalize on. While various academic studies examine learning and cooperation in CCA (cf. Baird et al., 2014; Hegger et al., 2012; Schmid et al., 2016 Hegger et al., 2012; Schmid et al., 2016), very few focus on international cooperation (Hickmann, 2016; Oberlack and Eisenack, 2014). European cooperation projects and the learning that occurs in these projects has received little attention (Colomb, 2007) with no studies focusing on learning related to CCA. Lastly, this study provides a basis for further comparative research in response to the call for comparative studies on environmental governance that embrace causal complexity and allow for the development of more general insights (Pahl-Wostl and Kranz, 2010; Young, 2013).

The remainder of this paper is structured as follows. Section 2 presents a framework to conceptualize and assess learning at multiple levels. Section 3 presents our case study and methods. The case study results are presented in section 4. The last section discusses our findings, the implications for future research and presents our main conclusions.

2. A multi-level perspective on learning

Over the past decades, numerous conceptions of learning have been developed and applied with attention for different "units of analysis" and learning contexts (Bennett and Howlett, 1992; Diduck, 2010; Rodela, 2011). In this section, we present a framework that synthesizes insights from various literature streams, including the literature on social and societal learning, organizational learning, project-based learning and transnational learning. Following an introduction of the conceptual framework, we elaborate learning outcomes and conditions for three levels of analysis. More information on the frameworks' theoretical background and the indicators used is provided in Table A1 in Supplementary material.

2.1. Introduction of a multi-level framework

For our understanding of learning, we depart from the literature on social learning. The concept of 'social learning' has been widely applied in the literature on natural resources management (cf. Cundill and Rodela, 2012; Rodela, 2011) and yet remains difficult to precisely define and conceptualize as the concept continues to incorporate a great diversity of meanings (Blackmore, 2007; Diduck, 2010; Muro and Jeffrey, 2008; Swartling et al., 2011). Following a definition by Reed et al. (2010), we assert that social learning occurs when social interactions and processes change the understanding of the individuals involved, which become situated within wider social units. We interpret 'wider social units' in a broad sense; they may refer to represented organizations as well as organizations, groups or networks that are not directly involved in the 'interaction process'.

For our assessment of learning, we assert that the learning that happens *inside* an interaction process as well as the learning that happens *outside* of the process are important when assessing social learning (Webler et al., 1995). This assertion is also central to an earlier study (Pahl-Wostl et al., 2007) that models social learning as a process consisting of the following interdependent levels: (1) the micro-level where individuals interact; (2) the meso-level consisting of organizations; and (3) the macro-level, which is formed by the governance and societal context. At each of these levels, learning involves different social units and has different meanings necessitating the development of distinct conceptions of learning (Bennett and Howlett, 1992; Diduck, 2010). Building upon previous studies that specifically focus on international cooperation and learning (cf. Böhme, 2005; Colomb, 2007; Hachmann, 2008, 2013; Valkering et al., 2013) we conceptualize relevant learning processes as follows (see Fig. 1). At the micro-level, 'group learning' occurs when participants who are directly and intensely involved learn, individually or as a group, through their social interactions (e.g. in a partnership or in sub-groups thereof) (Hachmann, 2008; INTERREG IVC, 2013). At the meso-level, 'organizational learning' occurs when knowledge that has been generated or acquired by participants in the interaction process is
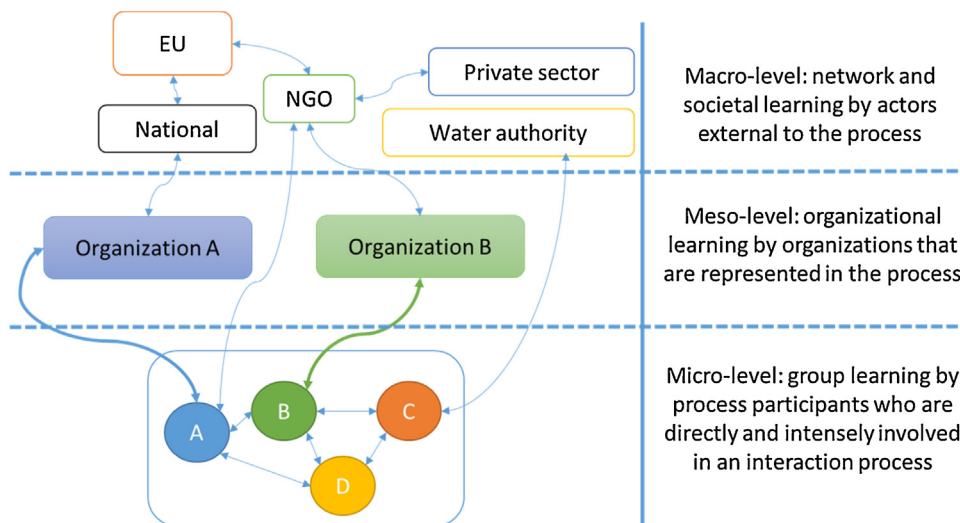
Fig. 1. Three-level representation of learning in an interaction process.