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The Adaptive Capacity Wheel: a method to assess the inherent characteristics of institutions to enable the adaptive capacity of society

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ABSTRACT

Climate change potentially brings continuous and unpredictable changes in weather patterns. Consequently, it calls for institutions that promote the adaptive capacity of society and allow society to modify its institutions at a rate commensurate with the rate of environmental change. Institutions, traditionally conservative and reactive, will now have to support social actors to proactively respond through planned processes and deliberate steps, but also through cherishing and encouraging spontaneous and autonomous change, as well as allowing for institutional redesign. This paper addresses the question: How can the inherent characteristics of institutions to stimulate the capacity of society to adapt to climate change from local through to national level be assessed? On the basis of a literature review and several brainstorm sessions, this paper presents six dimensions: Variety, learning capacity, room for autonomous change, leadership, availability of resources and fair governance. These dimensions and their 22 criteria form the Adaptive Capacity Wheel. This wheel can help academics and social actors to assess if institutions stimulate the adaptive capacity of society to respond to climate change; and to focus on whether and how institutions need to be redesigned. This paper also briefly demonstrates the application of this Adaptive Capacity Wheel to different institutions.

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1. Introduction

The global climatic system and human society are continuously changing systems. They sometimes evolve in response to impacts emerging from the other system and sometimes

they evolve autonomously (cf. Gilbert, 2006). Throughout human history, institutions (social patterns) have reacted incrementally and conservatively to deal with social problems as they are based on cultural practices, deep-rooted lifestyles and ideological premises (Gupta and Dellapenna, 2009; Pollit

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and Bouckaert, 2000). As such, institutions provide stability and predictability, without which every form of collective action of society would be impossible (Scharpf, 1997). Since the industrial revolution, human activities have led to a more rapid rate of environmental change. As the natural sciences are becoming better in predicting the potential future environmental impacts of anthropogenic activities, for example in the case of climate change, institutions will increasingly need to be able to rise to the challenge of incorporating new information and becoming more proactive and progressive in coping with the projected impacts of environmental change. From a social science perspective, it becomes critical to study the conditions under which institutions can stimulate the adaptive capacity of society to deal with the potentially serious and irreversible impacts of environmental change.

Against this background, this paper seeks to address the question: How can the inherent characteristics of institutions to stimulate the adaptive capacity of society from local through to national level be assessed? This question will be applied to the issue of climate change adaptation. This conceptual paper builds on the literature to identify dimensions and criteria and shows how these can be represented in an 'Adaptive Capacity Wheel', an analytical tool to assess the adaptive capacity of institutions (see Section 2). It presents a research protocol for applying the Adaptive Capacity Wheel (see Section 3), demonstrates some applications of the Wheel (see Section 4) and draws conclusions (see Section 5).

2. Towards a conceptual framework

2.1. An institutional approach to adaptive capacity

The study of adaptation to climate change is a rapidly evolving field. Society will have to be ready to anticipate and respond to changes that may occur. Consequently its institutions need to support social actors to proactively respond. Because climate change brings unpredictable changes, it calls for institutions that enhance the adaptive capacity of society. This paper develops a generic and flexible framework for assessing the extent to which different characteristics of institutions enable the *adaptive capacity* of societies.

This section highlights the literature on the subject, the gaps in knowledge, presents a definition of institutional adaptive capacity building on the existing literature, and introduces the Adaptive Capacity Wheel.

2.2. The literature and its gaps

There is an explosion in the literature on adaptation to climate change in the last 10 years. This has mostly dealt with the impacts of climate change, vulnerability to the impacts (e.g. Adger, 2006) and its criteria and indicators (e.g. Smit and Wandel, 2006; Brooks et al., 2005; Eriksen and Kelly, 2007; Moss et al., 2001), and adaptation to the impacts of climate change (e.g. IPCC, 2007; O'Brien et al., 2006; Eakin and Luers, 2006; Rasmussen et al., 2009; Polsky et al., 2007).

Vulnerability and adaptive capacity are closely linked concepts: adaptive capacity is one of the determinants of vulnerability, in addition to exposure and sensitivity. This

paper only focuses on adaptive capacity and not on the other two determinants. In the literature, some authors have discussed adaptive capacity specifically (Tol and Yohe, 2006; Eriksen and Lind, 2009; Pelling et al., 2008; Gallopín, 2006), others use the term resilience (Nelson et al., 2007; Folke et al., 2005; Milman and Short, 2008). While the articles focus on the adaptive capacity of households (Vincent, 2006; Paavola, 2008), of local communities (Smit and Wandel, 2006; Nelson et al., 2008; Pelling and High, 2005; Agrawal and Perrin, 2008; Bapna et al., 2009) and of nations (Haddad, 2005; Tol and Yohe, 2006); there is little research on assessing institutions on their ability to enhance the adaptive capacity of society (WRR, 2006). Furthermore, while much of this literature does mention institutions, they tend to use the word quite loosely (e.g. Yohe and Tol, 2002 imply organizations, and to a lesser extent, Agrawal & Perrin, 2008 do so as well). The website of the United Nations Framework Convention on Climate Change lists a number of tools on adaptation, but these do not include an exclusive tool to assess institutions, nor do they provide adequate information on institutions in relation to adaptive capacity in other tools. At the same time, there is a rich history of literature on institutions, governance and management. This paper attempts to bridge the existing literature on institutions, governance and management with the newer literature on adaptation and adaptive capacity to develop a conceptual and methodological framework to assess how institutions can promote the adaptive capacity of societies.

2.3. Definitions of key term – institutions

The Institutions Project of the International Human Dimensions Programme defines institutions as: "systems of rules, decision-making procedures, and programs that give rise to social practices, assign roles to the participants in these practices, and guide interactions among the occupants of the relevant roles" (IDGEC, 1999, p. 14). The rules and roles can be formal governmental policies and informal social patterns of engagement; they can be visible and latent (Arts, 2006). In ordinary speech, the word 'institutions' is seen as synonymous with 'organizations'. Although organizations can be seen as formalised patterns of rules and decision making, institutions are not equivalent to organizations, as institutions also refer to underlying ideological values and norms (Zijderveld, 2000; Young, 1989; IDGEC, 1999).

Institutions are inherently conservative. This is their strength and yet a weakness. Institutions are agreements following long debate, and if these hard-won institutions would not survive until the next day, there would be little point in creating them. Moreover, institutions carry the bias of previous interactions, views and power relations (Klijn and Koppenjan, 2006), a process called institutionalization (Garud et al., 2007; March and Olsen, 1989). Hence, all institutions embed a degree of robustness and resistance to change.

While institutions shape social practices, at the same time those social practices constitute and reproduce institutions (e.g. Giddens, 1984). The same agency that sustains the reproduction of structures also makes possible their transformation. Hence, institutions change and *can* be changed, but it is difficult to do so. It is critical to ask: Do institutions allow

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