CHALLENGING BARRIERS IN THE GOVERNANCE OF CLIMATE CHANGE ADAPTATION

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Challenging barriers in the governance of climate change adaptation

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Abstract

Adaptation is considered to be a necessary response to manage the unavoidable impacts of climate change. Even though societies have always adapted to socio-ecological changes, climate change is expected to require additional adaptation efforts. Examples from policy practice demonstrate that adaptation is not a straightforward, barrier-free process. Removing these barriers is considered a precondition to ensure successful societal adaptation. The burgeoning literature on climate change adaptation has been unable to move beyond itemizing the barriers to adaptation and has developed static and linear views on how to overcome them. This thesis seeks to open-up the black box of barriers in the governance of climate change adaptation by cycling between the empirical manifestation of barriers and the conceptual understanding of barriers so as to develop a meaningful way to analyse them. To this end, a combination of theories is used in a mixed method research design allowing for a robust and diverse exploration of the barriers to adaptation.

To assess what policy actors consider to be important barriers to adaptation, a systematic review method was used to identify what the existing literature describes as barriers to adaptation. Identification of these barriers provided the input for the design and implementation of an online survey to test whether there were similarities and differences in what policy actors considered as most important barriers to adaptation in the Netherlands and United Kingdom. Qualitative comparative analysis was used to formulate and test hypotheses about the role of institutional context in what actors consider as important barriers to adaptation. The results of the surveys show high agreement about the most important barriers, with the discordance between long term impacts and short term politics being the most important in both countries. The other barriers are not specific to adaptation but are considered important because of the conditions that the additionality dimension of adaptation creates.

To unravel the barriers to adaptation conceptually a number of steps was taken. The systematic review results showed that in the adaptation literature there is one dominant set of assumptions about the barriers, what we have called the problem solving lens. The influence of this dominant framing was explored by developing and adopting three alternative theory-driven and empirically-validated lenses to analyse the process of dismantling the Dutch inter-ministerial program 'Spatial adaptation to climate change'. The results demonstrate that different lenses result in both complementary and conflicting views about the barriers to adaptation and the influence barriers had on the process. We adopted the so-called realist perspective and conceptualised barriers to adaptation as simplified social constructs that are created by both academics and policy makers in order to better understand and evaluate the complexities in the governance of adaptation.

By adopting a realist-analytical view, this dissertation also argues that the concept of barriers is of limited value when aiming to explain outcome patterns arising from the implementation of adaptation policies. Recognizing the descriptive limits of existing frameworks on barriers to adaptation, this dissertation proposes a mechanismic framework - consisting of impasses, mechanisms, context, and interventions - that allows for plausible causal explanations about how impasses are reached in the governance of adaptation. To empirically test the framework, process tracing methodology was used in studying the implementation of Water Plazas in Rotterdam. The framework revealed three operative mechanisms that were necessary to explain the occurrence of the observed impasse; the risk-innovation paradox, conflict infection, and frame polarization.

The proposed framework is an important contribution as it offers researchers a way to move away from simply describing the challenges of governing adaptation to explaining those challenges. Additionally, by understanding the operative mechanisms, it open ups new possibilities for practitioners to make strategic interventions.

- I hope this makes you proud -

Acknowledgements

It would be too much of a cliché to begin a dissertation on barriers to adaptation by arguing that completing it has been a journey characterised by encountering and overcoming barriers. So I won't. Instead, I would like to take this opportunity to thank a number of persons who in tangible and intangible ways contributed to this dissertation. Of course, writing a dissertation is a highly individual process that is intended as first step in becoming an independent academic researcher, but it could not have been completed without the invaluable collegial friendships which created an intellectually inspiring environment to work in.

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CHAPTER 1

General Introduction

1.1. Background and problem outline

In the last decade policy debates about climate change shifted from seeing it as a greenhouse gas emission problem towards the acceptance that some climate change impacts are inevitable and require adaptation (Klein et al. 2007; Swart and Raes 2007; Biesbroek et al. 2009; Jordan et al. 2010; Moser 2011). Although one might argue that societies have adapted to environmental change throughout history, thereby making adaptation nothing new, the current "deliberate and self-conscious" focus on adaptation has created a new political and scientific discourse in responding to future climate change risks (Adger et al. 2009a, p336; Bassett and Fogelman 2013).

Many of the climate risks society faces today, such as extreme floods, droughts and erratic weather events, already demonstrate the recurrent failures in the way existing climate variability is governed (Burton 2004). Arguably, society is even worse prepared for the new risks as a consequence of anthropogenic contributions to climate change. Within the emerging discourse on adaptation, it is argued that "...formidable environmental, economic, informational, social, attitudinal and behavioural barriers to the implementation of adaptation" hamper progress towards the normatively defined goal of successful adaptation to climate change (IPCC 2007c, p19). Barriers are expected to obstruct societal adaptation to such an extent that many efforts might fail altogether. As the World Economic Forum's Global Risk 2013 report observes, global failure to adapt to climate change is the second most important environmental risk and has the highest disruptive societal impact (WEF 2013).

Barriers to climate change adaptation have already been reported from policy practice. For example, international policy debates on climate change have centered around the most vulnerable groups and regions that are unable to adapt to climate change impacts due to low-adaptive capacity (Oxfam 2011). In Europe, the recently launched adaptation strategy (CEC 2013) and background reports (SWD 2013) identify numerous sectoral barriers that might hamper the European Member States

to adapt (EEA 2013). National governments themselves have undertaken efforts to identify barriers to adaptation and have begun to seek ways to overcome them. The Australian Government, for example, issued the Productivity Commission "...to assess regulatory and policy barriers to effective adaptation" and "...to identify reforms that are likely to increase community wellbeing by addressing barriers to effective climate change adaptation." (Productivity Commission 2012, p33 and p36). Especially at local and regional levels where adaptations are developed and implemented in practice the discussions on barriers have gained prominence (ESPACE 2005, 2007). All over the world, governments, public sector agencies, businesses and individuals are starting to use multi-stakeholder platforms, workshops, and participatory methods to raise awareness and identify the barriers to adaptation (Barnett et al. 2013; Mukheibir et al. 2013).

In parallel to these policy responses, the discourse on adaptation has enthused scholars to study the many dimensions on adaptation to climate change, including the barriers to adaptation. However, emergent scholarship has thus far hardly been able to progress beyond describing barriers as isolated entities, or black boxes, in the process of developing and implementing climate change adaptation policies and measures. Important questions about what these barriers are or how barriers are conceptually linked to the decision making process, remain unanswered. Answers to these questions are vital to provide meaningful policy to overcome the barriers and progress in the adaptation process (Willows and Connell 2003; Clar et al. 2013) and will also support studying the policy dimensions of adaptation. Opening up the black box of barriers to adaptation is the objective of this dissertation. The remainder of this chapter presents the research strategy adopted in this dissertation, which cycles between empirical evidence on barriers to adaptation and existing theories on governance, public policy, and complex decision making. Section 1.2 discusses the key concepts used in this dissertation: the governance of adaptation, the current conceptualization of barriers to adaptation, and two types of frameworks that have been used to analyse barriers in governance processes. Section 1.3 expands on the objective of this dissertation and presents the research questions. Section 1.4 provides an overview of qualitative and quantitative methods that have been used to better understand the barriers to adaptation. This is followed by section 1.5 describing the structure of this dissertation.

1.2. Barriers in the governance of climate change adaptation: key concepts

Adaptation to climate change can be defined as 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" (McCarthy et al. 2001, p982). Adaptation includes physical measures and social change, may be purposefully planned or may evolve autonomously, can be localized or widespread, can focus on short term decisions or can have a long term scope (Smit et al. 1999). In the past, adaptation has predominantly been investigated as technical and natural scientific problem which is assessed through deterministic methods aiming to quantify climate change impacts and vulnerabilities (Pielke Jr 2005; Pielke Jr and Sarewitz 2005). It is

increasingly recognized that adaptation is as much a social process (Wolf 2012); people adapt in diverse and complex ways depending on their subjective, situated, and normative interpretations of climate change as problem, how they believe climate change threatens what they value, whether they are enabled or constrained by the situated context, if they believe to have the capacities and skills, and if they are willing to meaningfully engage in climate change adaptation (O'Brien and Wolf 2010; Adger et al. 2012). Significant differences in the perception of actors may exist which is, in turn, influenced by social networks and formal institutions. In understanding adaptation as social process there is an important role for governance (Dovers and Hezri 2010).

1.2.1. Conceptualizing the governance of adaptation

Governance can broadly be understood as ways of steering and management of parts of society in response to the emergence of societal problems (Pierre and Peters 2000; Rhodes 2007; Torfing et al. 2012). Governance has a long history and, over the years, the term has collected a wide variety of meanings. The term governance is often used as it has a positive connotation to which high expectations are easily attached. It is considered to be a modern concept that increases public legitimacy (Pollitt and Hupe 2011; Torfing et al. 2012).

Broadly speaking, two main understandings are present in the literature on governance: the mono-centric and polycentric types. Mono-centric governance refers to the process in which the state as a functional unit is dominant in hierarchically controlling and steering society, setting the societal and policy agenda, managing public goods through providing resources and legislation, and implementing top-down policies (Termeer et al. 2010; Aligica and Tarko 2012). This is sometimes called command and control governance (Kooiman 1993), or state governance (Considine and Lewis 2003). Mono-centric governance is frequently found in adaptation practices; Castán Broto and Bulkeley (2013, p100) found that 66 per cent of the 627 analysed urban climate change experiments were initiated by governments and more than half of these initiatives were undertaken by a government without other partners. Contrastingly, polycentric governance refers to situations where many different centers of decision making exist that, although independent from each other, are connected by shared institutional settings (Ostrom 2010). This view is central in the theories on policy networks (Börzel 1998), network governance (Torfing 2005), and multi-level governance (Hooghe and Marks 2003). Proponents argue that states nor markets are able to resolve the increasingly complex and multi-layered societal problems on their own and both become increasingly dependent on non-governmental actors (Pierre and Peters 2000). Governments still play an important role, for example by initiating, coordinating or facilitating the governance of adaptation (Lund et al. 2012). Governance studies have not produced a generally accepted model for studying policy processes but rather consists of a large body of literature divided into many schools and sub-schools (Torfing et al. 2012). This dissertation therefore refers to governance as the empirical observation of mono-centric or polycentric ways of steering and managing society towards adaptation.

Literature on governance explores the substantial challenges that emerge as a result of how governance is arranged. Mono-centric studies stress, amongst others, the challenges of authoritative decision making, technocracy and bureaucracy, and the inability of governments to innovate and change society (Pierre and Peters 2000). Polycentric studies stress, for example, the challenges caused by interdependency of decisions across levels of governance, or the unclear division of tasks and responsibilities between actors (Jessop 1998; Koppenjan and Klijn 2004).

The new scientific discourse on climate change adaptation considers the governance of adaptation to be particularly challenging. This is a consequence of the additionality dimension of climate change adaptation: those additional efforts that are intentionally made due to the projected impacts of the anthropogenic contributions of climate change (Dupuis and Biesbroek 2012). This suggests that, in addition to "ordinary" barriers in the governance process, specific barriers to adaptation might arise as consequence of the attributed uniqueness of climate change risks. Four characteristics of climate change adaptation are important to consider:

1. *Climate change adaptation is a way to respond to a scientifically constructed societal problem.* This is based on the understanding that only through model projections we are able to assess the scope, rate and direction of future long term climate change and to take into account the anthropogenic contributions to climate change (Demeritt 2001; Jasanoff 2010). This makes climate change adaptation ontologically complex and epistemologically distant (Carolan 2004; Esbjörn-Hargens 2010). Anticipative and planned adaptation is, therefore, dependent on the trustworthiness of knowledge; yet there remain inherent uncertainties in climate change projections that in many cases are perceived as a barrier to adaptation, but see Dessai et al. (2009). Such a knowledge driven topic can result in controversies about the legitimacy and credibility of the scientifically constructed knowledge (Hulme 2009; Weichselgartner and Kasperson 2010; Hoppe et al. 2013). Moreover, the understanding that there are limits to scientific projections implies that flexibility as well as robustness are important criteria to deal with unknowable unknowns (Pawson et al. 2011; Termeer and van den Brink 2013).

2. *Climate change has the characteristics of a 'wicked' societal problem.* Climate change risks cannot be solved through science or technology only, because of the contested nature of the problem. There are no agreed-upon framings of the problem as these are ingrained in, and the consequences of, dynamic, multi-layered social and cultural processes. For problems such as climate change, any action taken to address the problem inherently means changing the problem definition, thereby creating a continuous spiral of change (V. A. Brown et al. 2010). Because of the impact of each decision and the fast changing context, learning from past solutions through trial and error becomes nearly impossible. There cannot be a best or optimal solution, only hints of better or worse responses. These problem characteristics make decisions about adaptation notoriously difficult (Weber and Khademian 2008; Lazarus 2009; Levin et al. 2012; Termeer et al. 2013).

3. *Adaptation is a boundary spanning issue that is characterized by fragmentation and multifacetedness.* The impacts of climate change cross traditional boundaries, existing institutional structures, routines, policy arena's, networks, scales, and jurisdictions (Jochim and May 2010; Juhola and Westerhoff 2011). Governance of adaptation involves many different actors and becomes fragmented because of self-regulating tendencies of the existing institutional setting. This is strengthened by the advocated mainstreaming approach in existing, vulnerable policies and practices, where concerns are raised about fragmented responsibility and authority to engage in adaptation across sectors and scales (Yamin 2005; Kok and de Coninck 2007). These in turn incite new interdependencies between sectors and institutions and construct new partnerships, governance arrangements, and instruments to govern adaptation, therewith creating a complex institutional setting (Adger et al. 2009b).

4. *Adaptation is a continuous process of change without a clear goal or end state.* Adaptation is dependent on and adjusted through the properties emerging from the problem while the problem itself is displayed in an erratic and situated fashion. As such, there is no clear beginning or end nor a single pathway to achieve the normative goal of successful adaptation (Adger et al. 2005). Moreover, what terms like well-adapted, robustness or climate proofing mean is hardly explicit. Adaptation essentially means to bring about change, but most societal systems are renowned for their resistance to change, especially in situations where the reasons for change are not self-explanatory or even controversial (Duit and Galaz 2008). In the absence of goals the direction of change also becomes problematic. Consequentially, decision making on adaptation is suggested to focus on short term decisions that take into account the long term perspective (Underdal 2010), whilst simultaneously trying to prevent that the measures are maladaptive (Barnett and O'Neill 2010) and to prevent future lock-ins in decision making.

The characteristics of the governance of adaptation and the observations in policy practice that adaptation is no barrier free process has already induced several other studies into the barriers to adaptation.

1.2.2. Conceptualising barriers and limits to climate change adaptation

The literature on the governance of climate change adaptation is rather ambiguous in terminology; for example, many studies use the terms "limits" and "barriers" interchangeably although differences also exist in the literature. Limits can refer to either the biophysical limits that are insurmountable and inherent to the system (Dow et al. 2013), or to social limits that emerge from within the social system that are "mutable, subjective and socially constructed" (Adger et al. 2009a, p338). Social limits are "...the conditions or factors that render adaptation ineffective as a response to climate change' (Adger et al. 2007, p733; Hulme et al. 2007). They constitute the physical or social thresholds, or tipping point, beyond which intolerable losses are expected or experienced (Dow et al. 2013) and require more than incremental changes in the physical or social systems (Kates et al. 2012; Rickards, 2013). Barriers can be defined as the consequence of "...action in financial, cultural and policy realms that raise questions about the efficacy and legitimacy of adaptation as a response to

climate change" (Adger et al. 2007). What is considered to be a barrier ultimately depends on the goal of adaptation. Because each context will bring its own goals and contextual conditions, barriers are expected to differ from place to place, from sector to sector, and change over time (Barnett 2010). It is argued that barriers can be overcome if sufficient skills, creativity, resources are available or when sufficient efforts are made.

Chapter 17 of the IPCC-AR4-WGII provides several examples of barriers to adaptation. At the level of the individual, emphasis is on the cognitive, motivational, and behavioural constraints that persons encounter and that, in their opinion, hamper meaningful engagement in climate change adaptation (Grothmann and Patt 2005; Lorenzoni et al. 2007b; Swim et al. 2009). On the one hand, if people do not feel that climate change threatens what they value, there is no incentive to adapt. On the other hand, too much perceived climate change risks may also lead to fatalism and inaction (Weber 2010; Gifford et al. 2011; Stern 2011). At the governance level, various examples of barriers are identified as well; for example, existing institutional structures can constrain the efforts of those that are willing to adapt; considerable uncertainties and knowledge gaps exist in climate projections which hampers decision making; limited awareness of the public and policy makers exists about long term climate change risks; a lack of government involvement in coordination and support of adaptation can limit progress.

Thus far scholarship on barriers to adaptation has not been able to go beyond the shorthand descriptions of barriers presented above, which only scratch the surface of the complex and dynamic underlying social processes. Few studies exist that conceptualize barriers in the governance of adaptation in more detail or that try a thorough empirical analysis of barriers that goes beyond the situated and inductive.

1.2.3. Conceptualizing the policy process: stage models and processual models

At the start of this dissertation, in 2008, no frameworks to study barriers to adaptation existed. Frameworks are important instruments in the study of governance as they constitute a means for simplification of complex reality by capturing and connecting all aspects of inquiry in a unifying set of visible and invisible components (Ostrom 2005). Explicit frameworks are imperative because they capture the basic assumptions of a researcher about the governance process and provide structure and coherence in the analysis. Studies on the policy process have produced a wide arsenal of frameworks, theories and models to analyse decision making processes. To study barriers in the policy process, existing frameworks can generally be classified into stage models and processual models, but see Teisman and Van Buuren (2012) for combinations of both models.

The first comprehensive study to conceptualize and explicate barriers that actors encounter in the decision making process was the seminal study by Bachrach and Baratz (1970) on the anti-poverty program in Baltimore, US. Building on the stage model, the authors demonstrate how an actor can exercise power through regulation and resources, in order to control the policy agenda. In this model, barriers are