

Developing Adaptation Policy and Practice in Europe: Multi-level Governance of Climate Change

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Edited by

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This work largely began in 2006, at which time I was a visiting scholar at the Environmental Change Institute at Oxford University, and had the opportunity to join in some of the UK Climate Impacts Programme (UKCIP) consultations with regional climate change partnerships. What surprised me at that time was the advanced stage of adaptation at regional and in some cases even local levels – and the relatively broad awareness of adaptation needs in many of these cases. The experience led me to develop a research project application to study the differences in adaptation to climate change in European countries. The project was funded by the Swedish Research Council in 2007 under the title ‘Organising Adaptation to Climate Change in Europe’ (EUR-ADAPT). For David Ellison’s contribution ([Chapter 2](#)), we are also grateful for the support of the Future Forests research programme, funded under a call by the Mistra Foundation for Strategic Environmental Research. In addition to this volume, the projects outputs have also included several articles.

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Carina Keskitalo

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Abbreviations

ACACIA	Consortium for the Application of Climate Impact Assessments
ACC	Adapting to Climate Change (UK)
ACCC	Austrian Council on Climate Change
ADAGIO	Adaptation of Agriculture in European Regions at Environmental Risk under Climate Change
ADAM	Adaptation and Mitigation Strategies – Supporting European Climate Policy
ALFRA	Association of Finnish Local and Regional Authorities
ANPA	National Agency for Environmental Protection (Italy)
AMICA	Adaptation and Mitigation – an Integrated Climate Policy Approach
ARK	National Programme on Climate Adaptation and Spatial Planning (Netherlands)
ARPA	Regional Environmental Protection Agency (Italy)
BaltCICA	Climate Change: Impacts, Costs and Adaptation in the Baltic Sea Region
BC	British Columbia
BMLFUW	Federal Ministry of Agriculture, Forestry, Environment and Water Management (Germany)
BRANCH	Biodiversity Requires Adaptation in Northwest Europe under a Changing Climate
CAP	Common Agricultural Policy
CC	City Council
C-CIARN	Climate Change Impacts and Adaptation Research Network (Canada)
CCIRG	Climate Change Impacts Review Group (UK)
CCP	Cities for Climate Protection
CCPCC	Coordination Commission of Climate Change Policies (Spain)
CcSP	Climate changes Spatial Planning (Netherlands)
CFMP	Catchment Flood Management Plans (UK)

CICERO	Centre for International Climate and Environmental Research (Norway)
CIPE	Interministerial Committee for Economic Planning (Italy)
CIRCE	Climate Change and Impact Research: the Mediterranean
ClimChAlp	Climate Change, Impacts and Adaptation Strategies in the Alpine Space
CMCC	Euro-Mediterranean Centre for Climate Change
CO	Carbon dioxide
CSIRO	Commonwealth Scientific and Research Organisation (Australia)
DECC	Department for Energy and Climate Change (UK)
DEFRA	Department of Environment, Food and Rural Affairs (UK)
DETR	Department for Environment, Transport and the Regions (UK)
DG	Directorate General
DMP	Drought Management Plans (EU)
DPC	Italian Department for Civil Protection
DSB	Directorate for Civil Protection and Emergency Planning (Norway)
EAFRD	European Agricultural Fund for Rural Development
ECCE	Effects of Climate Change in Spain
ECCP WG II	Working Group II on Impacts and Adaptation (EU)
ECCP II	Second European Climate Change Programme
ECSC	Energy Centre for Sustainable Communities (Sweden)
EEDA	East of England Development Agency
EEA	European Environment Agency
ENEA	Italian National Agency for New Technologies, Energy and the Environment
EPA	Environmental Protection Agency
ESPACE	European Spatial Planning: Adapting to Climate Events
ESRC	Economic and Social Research Council
EU	European Union
EURISLES	European Islands System of Links and Exchanges
FIGARE	Finnish Global Change Research Programme
FINADAPT	Assessing the Adaptive Capacity of the Finnish Environment and Society under a Changing Climate
FINESSI	Integrated assessment modelling of global change impacts and adaptation
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GMES	Global Monitoring for Environment and Security
GO	Government Office
GOL	Government Offices London
GOSE	Government Office South East

GR	Gothenburg Region Association of Local Authorities
GRaBS	Green and Blue Space: adaptation for urban areas and eco towns
HMAC	Helsinki Metropolitan Area Council
ICID	International Commission on Irrigation and Drainage (Hungary)
IDeA	Improvement and Development Agency for Local Government (UK)
IESE	Improvement and Efficiency South East (UK)
IMC	Hydro-Meteorological and Climate Service (Italy)
IPCC	Intergovernmental Panel on Climate Change
ISPRA	Italian Institute for Environmental Protection and Research
ISTO	Climate Change Adaptation Research Programme (Finland)
JRC	Joint Research Centre
KLIMZUG-NORD	Strategic approaches to climate change adaptation in the Hamburg Metropolitan Region
LA21	Local Agenda 21
LAA	Local Area Agreement (UK)
LCLIP	Local Climate Impacts Profile (UK)
LGA	Local Government Association (Sweden)
LIP	Local Investment Programme (Sweden)
LRAP	Local and Regional Adaptation Partnership (UK)
LSP	Local Strategic Partnerships (UK)
MATTM	Italian Ministry of Environment and Territory
MCPFE	Ministerial Conference on the Protection of Forests in Europe
MNC	Multi-National Corporations
NARP	National Adaptation Research Plan (Australia)
NAS	National Adaptation Strategy
NCCS	National Climate Change Strategy (Hungary)
NCCARF	National Climate Change Adaptation Research Facility (Australia)
NGO	Non-Governmental Organisation
NI	National Indicator
NORKLIMA	Climate change and its impacts in Norway
NPACC	National Plan for Climate Change Adaptation (Spain)
NPM	New Public Management
OECC	Spanish Climate Change Office
OECD	Organisation for Economic Cooperation and Development
ONERC	French National Observatory of the Effects of Climate Warming
PCAN	Portsmouth Climate Change Action Network
PEER	Partnership for European Environmental Research
PESETA	Projection of Economic impacts of climate change in Sectors of the European Union based on bottom-up Analysis
PPG	Planning Policy Guidance (UK)

PPS	Planning Policy Statement (UK)
PSA	Public Service Agreements (UK)
PSAG	Portsmouth Sustainability Action Group
PUSH	Partnership for Urban South Hampshire
RA	Regional Assembly (UK)
RAC	Regional Adaptation Collaboratives (Canada)
RBMP	River Basin Management Plans
RCCP	Regional Climate Change Partnership (UK)
RDA	Regional Development Agency (UK)
REC	Regional Environment Centre (Finland)
REGKLAM	Integrated Regional Climate Adaptation Programme (IRCAP) for the Model Region of Dresden
RIEP	Regional Improvement and Efficiency Partnerships (UK)
SALAR	Swedish Association of Local Authorities and Regions
SEEDA	South East England Development Agency
SEERA	South East England Regional Assembly
SEK	Swedish kronor
SGU	Geological Survey of Sweden
SHI	Swedish Geotechnical Institute
SILMU	Finnish Research Programme on Climate Change
SMHI	Swedish Meteorological and Hydrological Institute
SSNC	Swedish Society for Nature Conservation
TÖOSZ	Hungarian National Association of Local Governments
UK	United Kingdom
UKCIP	United Kingdom Climate Impacts Programme
UKIRCCG	United Kingdom Interregional Climate Change Group
UN	United Nations
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
VAHAVA	Weather and Climate: Changes-Impacts-Answers (Hungary)
VROM	Ministry of Housing, Spatial Planning and Environment (Netherlands)
VTT	New Vásárhelyi Plan (Hungary)
WFD	Water Framework Directive
WWF	World Wildlife Fund

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Chapter 1

Introduction – Adaptation to Climate Change in Europe: Theoretical Framework and Study Design

E. Carina H. Keskitalo

Abstract As mitigation will not likely be sufficient to hinder climate change, adaptation to the consequences of climate change will be needed. The impacts of climate change will include such phenomena as increased flooding and sea level rise, which will in turn have significant effects on densely populated and infrastructurally-developed areas in advanced industrial states. Despite the potential for serious consequences, very little of the existing climate change adaptation literature has focused on adaptation in the EU or the industrialised world in general. This chapter and the volume at large address this gap. This chapter describes the governance system of public and private actors and bodies that set the context for adaptive capacity at local, regional, national and EU levels, and argues that adaptive capacity can largely be seen as related to the resource distribution and prioritisation processes within such systems. The chapter further outlines the comparative approach taken by the volume, including a common methodology for the presented multi-level studies.

Keywords Adaptation · Adaptive capacity · Climate change · Multi-level governance

1.1 Introduction

Climate change will pose major challenges for adaptation in Europe. Even if greenhouse gas emission outputs were to cease completely (an unlikely accomplishment), existing levels of greenhouse gases in the atmosphere indicate that mitigation alone would be insufficient in preventing the effects of climate change. As a result, adjustments and adaptations to cope with the effects of climate change will be required. Given this need, the assessment of vulnerability to climate change and the possibility for adaptation has been identified as a priority area for research (IPCC, 2007).

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Projected impacts of climate change for Europe include shorter winters, the earlier onset of spring with a corresponding increase in precipitation and flood risk, warmer and drier summers with an increase in risk of heat waves, and a later autumn, with large variations across countries and regions (IPCC, 2007; EEA, 2008). Adaptations to such changes may take the form of a number of responses at local, national and even international levels, including early warning systems, changes in planning systems and the development of adaptation strategies at different levels. In some cases, the need for adaptation may even prompt a greater awareness of the limitations of spatial planning based on the assumption of a steady state (i.e. one based on the existing situation), as climate change may come to change the distribution of species and patterns of flood and drought.

While knowledge of likely changes in climate is fairly well developed, less research has been conducted on how such changes can and will impact societies, or on the actual or perceived possibilities for and obstacles to further adaptation. So far, mainly localised, single-sector case studies have been conducted (cf. IPCC, 2001; Keskitalo, 2008), often either on a community scale (e.g., Ford & Smit, 2004) or as an overview of general national vulnerability (e.g., O'Brien et al. 2004). Very little has been done to evaluate the different ways in which institutions in different national contexts or at different organisational scales may adapt to climate change (Adger, Brown, & Tompkins, 2004a). So far, adaptation to climate change has also been viewed principally as a question for developing countries, while the treatment of adaptation in advanced industrial states has been limited (Gagnon-Lebrun & Agrawala, 2007). As a rule, adaptation in developed countries has been framed separately and developed into policy later than mitigation, indicating that a state can be both a leader on adaptation and a follower on mitigation (cf. Lorenzoni, O'Riordan, & Pidgeon, 2008).

In 2007, Gagnon-Lebrun and Agrawala (2008) noted that 'no developed country ha[d] yet formulated a comprehensive approach to implementing adaptation and the "mainstreaming" of such measures within sectoral policies and projects, although the UK might be coming close' (p. 401). Over the last couple of years, however, this has begun to change. A frontrunner to date, the United Kingdom (UK) began its climate impacts programme in 1997 and implemented a Climate Change Act in 2008, including requirements and economic incentives for adaptation at the municipal level as well as by national government. This leadership is particularly notable as the UK so far has not been a strong leader in environmental policy in the European Union (EU), but is now taking a leading role on adaptation (cf. Börzel, 2002).

Another relatively early mover among industrialised countries, both in adaptation and to some extent in environmental policy, is Finland. In 2007, Gagnon-Lebrun and Agrawala (2008) noted that Finland was 'moving towards implementing adaptation in many sectors' (p. 402), and in 2008 Finland developed a national adaptation strategy that mainstreams adaptation across governmental sectors. By contrast, Sweden – traditionally seen as a leader in environmental policy – has been more of a slow mover on adaptation and has instead focused principally on mitigation. While adaptation is included in Sweden's 2009 National Bill on climate and energy, adaptation has so far been relatively fragmented, with adaptation measures emerging

mainly in areas where particularly significant risks have been identified. The differences between these two countries are particularly interesting given the considerable similarities between Sweden and Finland with regard to their national political, administrative and planning systems. Finally, in countries that are traditional followers in environmental policy, such as Italy, adaptation has been developed in select local cases as a response to existing risks, but with limited future-oriented planning as a result of the absence of any structured national adaptation policy.

This volume describes the development of adaptation to climate change in the above-mentioned European Union (EU) countries at the national scale, as well as in select nested regional and local cases where development of adaptation policy has been relatively early. Case studies include countries with varying characteristics across a number of spectra: political and planning systems, environmental policy tradition, and extent of policy and practice on adaptation. The volume also includes a chapter on the role of the EU, including the impact of EU policy that is not explicitly linked to adaptation but that may impact the potential for adaptation in different countries. Examples of these include the EU common agricultural policy, EU projects that support climate research, and EU environmental policy (e.g., the Habitats and Water Framework Directives) that direct policy in sectors with the potential to be strongly impacted by climate change. The book further includes a comparison with industrialised countries beyond the four main cases, selected to exemplify broad groups of varying environmental policy and planning systems. This comparison is undertaken with the aim to discuss the potential impact of different political system characteristics on adaptation policy development. Countries included in the comparative chapter include both those with centralised and decentralised planning systems and federal and unitary states within Europe (Germany, Austria, France, Spain, Greece, Hungary, the Netherlands and Norway) as well as industrialised country cases outside the EU (Canada and Australia).

The aim of this volume is to further the understanding of the concept of adaptive capacity in a governance context through narrative description and analysis of the factors that have allowed for adaptation in each of these national to local cases. The study problematises the issue of governance and adaptation across levels and sectors with a basis in the following questions:

1. What is the governance context for climate change adaptation? In other words, what policies and action programmes exist on different levels and how well are these coordinated across levels and sectors? This question includes a focus on multi-level governance and the extent to which actions on local and regional levels are dependent on the national context, as well as the extent to which local actors are able to respond independently or even to 'jump scales' (Jones, 1998) by drawing on EU frameworks or funding.
2. To what extent have differences in political and planning systems and determinants of adaptive capacity, such as access to information, economic resources and institutional capacity, influenced the form of adaptation policy and adaptation measures that have developed in response to identified vulnerabilities? This question includes a focus on the extent to which different capacities can

compensate each other: for instance, whether there are examples where local political leadership has been able to develop local adaptation policy and measures, even in the face of limited economic resources or in cases where national level responses are less prominent.

3. To what extent can examples be found that are considered by actors in different countries to be transferable between contexts, and that may support policy transfer or ‘lesson drawing’ on adaptation? Given the ongoing development of adaptation policy, this question aims to respond to the need identified by many interviewees to access examples of processes and models elsewhere that may speak to local needs – an aim also expressed in the EU Green Paper on adaptation (2007).

Adaptation is thus inherently viewed as taking place within a political context on multiple levels, within which responses are formed by multiple interests, including those in the existing political and administrative systems. This chapter first outlines the theoretical background for the book in terms of multi-level governance, describing the factors that may impact adaptive capacity within a political context and on national, regional, local and EU levels, respectively, as well as in relation to policy transfer and lesson-drawing. The study thus explicitly aims to define adaptive capacity within a governance context and connect adaptive capacity literature to a broader political science literature. The chapter then describes the methodology for the studies and concludes with an outline of the volume’s contents.

1.2 Theoretical Background

1.2.1 Multi-Level Governance and the Capacity to Act on Adaptation

Multi-level governance is defined as decision-making that is steered not only by public but by private and other interests, and as a process that takes place across multiple geographic scale levels and sectors (Boland, 1999; Hooghe & Marks, 2003). While national governments have generally been seen as the principal actors in decision-making, discussions have emerged in recent years of the role of complementary or competing systems such as the EU, and of an increased devolution to the local level: ‘what has emerged . . . in recent years, is a complex set of overlapping and nested systems of governance involving European, national, regional, and local actors, groups and networks’ (Loughlin, 2001, p. 20).

Climate change is a problem that poses high requirements for governance by requiring the coordination of demands and needs across international, national, regional and local scales, as well as coordination between sectors (e.g., across departments that deal with environmental, energy and financial issues, or between private and public sector actors). In addition, the way in which climate change impacts and adaptation are treated by actors on different levels is to a large extent

dependent on differential adaptive capacities, including financial resources, access to information, decision-making structures and other institutional features (Smit & Wandel, 2006). The fact that there may be sufficient access to resources for adaptation at the national scale does not necessarily translate to a high adaptive capacity at local scales. Similarly, high resource access at the local scale (for example, in municipalities with significant economic resources) does not necessarily lead to the development of adaptation unless adaptations have been defined as urgent in the local context or the implementation of adaptation measures is required by national legislation (Næss, Thorsen Norland, Lafferty, & Aall, 2006).

An assessment of adaptive capacity in a governance context requires an assessment of the attribution of responsibility for adaptation to climate change. Vulnerability literature has often argued that adaptation to climate change needs to take place at the local level (cf. Næss, Bang, Eriksen, & Vevatne, 2005), where vulnerability to specific stresses (e.g., the flooding of specific areas) and adaptive capacity (the resources to deal with these threats) can be defined. For instance, an area with extensive economic resources may respond to climate change in very different ways than an area with fewer. Such differences could lead to responses as different as abandoning low-lying areas or defending them against floods, even where rise in sea level may be the same or the areas in question may be situated in close proximity along the coastline. However, this fact problematises in particular the responsibility attributed to different scales within the political system, both in terms of responsibility and the corresponding allocation of resources, as well as in terms of the potential for policy development and implementation specifically on adaptation. As McConnell (2003) notes on crisis and emergency management, adaptation may be considered ‘[a]t heart. . . a political activity’ (p. 409).

Relevant roles and the distribution of responsibilities in the context of existing institutional structures thus include, among others, the role of the regional level and local authorities in relation to the national level. The policy style concept (e.g., Richardson, 1982) has been used to demonstrate that ‘each nation’s regulatory style is a function of its unique political heritage’ (Andersen, 1999, p. 25), indicating that ‘policy actors in different governance systems do not necessarily propose the same course of action when faced with similar policy problems’ (Wurzel, 2002, p. 17). The policy style concept also indicates that an emerging issue such as adaptation will most likely come to be regulated in ways similar to those applied to existing issues.¹ Different countries and institutions can thus be seen as exhibiting a certain degree of path dependence, which is often seen as an indication that ‘initial social outcomes concerning institutional, organisational, or policy design – even suboptimal ones – can become self-reinforcing over time’ (Pierson, 2002, p. 372). Historical

¹Similar mechanisms are also present in theories of governmentality, which note that specific mentalities may govern the selection of programmes and instruments to regulate particular fields (cf. Rose, 1996; Keskitalo, Juhola, & Westerhoff, in prep). In relation to policy style literature, Wurzel (2002) adds that sectoral and sub-sectoral differences will also influence the regulation of environmental issues (e.g., within different branches of government).

choices thus contribute to form the options available today and the institutions that are available to handle these. However, some leeway in terms of paths chosen does exist, particularly as new issues come onto the political agenda. For example, Andersen (1999) notes that while the distribution of competences and resources may be seen as a constant struggle between actors and administrative levels, the potential for changes in standard operating procedures may be greatest when a new issue emerges.

Liefferink and Andersen (1997) note that ‘the most obvious opportunity to initiate innovations in a certain policy field is probably the process of agenda-setting . . . innovations may entail either the introduction of wholly new issues onto the agenda, or the definition and re-definition of problems and potential solutions’ (p. 11). The agenda-setting literature has emphasised that the rise of an issue on the agenda (e.g., to become institutionalised in policy and legislation) depends on the simultaneous existence of several factors, including policy entrepreneurs who push a given issue; indicators and events (e.g., storms or floods) that serve to problematise an issue to policy-makers, the media and the public; and existing politics and policy development that provide an entryway to the issue (cf. Kingdon, 1995; Baumgartner & Jones, 1993). Together, these factors support the development of a ‘policy window’ for the issue where adaptation or other forms of policy have the chance to develop until the window is closed (e.g., by new crises or events in unrelated areas) and other issues are moved onto the agenda (cf. Keskkitalo, Westerhoff, & Juhola, in prep.).

Other authors have noted a number of additional factors relevant to the agenda-setting literature, particularly in relation to environmental policy development and crisis response. Wurzel (2002) describes a number of explanatory variables for domestic environmental policy action, including ecological vulnerability or the state of the environment; economic capacity to deal with problems; the political salience of issues (including public environmental awareness and media attention to environmental issues); and environmental regulatory style, including modes of policy-making. Drawing upon examples from the UK, McConnell (2003) notes that the nature of crisis response depends on whether crises are sudden, creeping or chronic (prompting responses that range from improvised to business-as-usual); the perceived seriousness of the threat (where serious threats result in more centralised responses); the need for immediate action vs. longer-term consultation; and the political structure of the government and its individual departments. Other factors affecting agenda-setting include dominant political ideas, personalities, the media and public opinion, interest representation and the international and EU context (McConnell, 2003).

In much of the agenda-setting and crisis response literature, ‘focusing events’ have been particularly emphasised as powerful catalysts of policy development. However, focusing events also emphasise the degree of randomness in policy-making as potential long-term important actions may to some extent need to rely on events to push them and there is no guarantee that actions following an event will sufficiently take long-term planning into account. Johnston, Tunstall, and Penning-Rowsell (2005) note:

It is arguably the case that it takes a severe and damaging flood to place flooding on the political agenda, at a time when the public and media response is such that a failure to act is politically unacceptable. There is, however, no guarantee that the nature of the policy issues raised by a major flood disaster will offer anything more than post-event response and recovery. (p. 561)

Other literature additionally notes that responses to crises may include ‘passing the buck’ or non-action, often as a result of infighting between interests (McConnell, 2003). Policy implementation may fail as a result of diverse actors and perspectives, which makes for difficulties in reaching an agreement or result in the separation of policy design from implementation (Schuck, 2001).

These factors all describe the importance of attention being drawn to an issue and the need to be able to draw upon different types of resources (similar to those constituting adaptive capacity) in institutionalising or acting upon an issue such as climate change. In addition, agenda-setting, policy development or implementation of adaptation measures will often require action on different levels. For example, McConnell (2003) notes that elements of decentralisation are necessary in crisis response: ‘[m]ost crises or emergencies require those individuals close to the impact of the crises to take “local” decisions’ (p. 401). Given the requirement of different responses in different localities, adaptation may be considered an even more compelling example of the need for such decentralisation as well as coordination. Adaptation may thus be seen as an issue characterised by the need for multi-level responses, which are realised to different extents in different cases depending on whether the issue is able to rise on the agenda and the form in which this takes place in different countries, regions and localities.

1.2.2 Adaptive Capacity

Any assessment of vulnerability to change must be grounded in the sensitivity of a system to a certain exposure to change, as well as the capacity of the system to adapt to change without limiting important functions (Smit & Wandel, 2006). Exposure to climate change indicates the extent and type of climate change effects relevant for in the area in question, while sensitivity indicates the sensitivity of, for instance, ecosystems to such exposure. The term adaptive capacity is used to capture the ability of any geographical or organisational entity (e.g., county, region, community or individual) to cope with, adjust to, or recover from external stresses. Within adaptive capacity, particular adaptations are undertaken, often as uncoordinated responses among numerous actors spanning the individual, community, enterprise, state and international levels (IPCC, 2007; Smit & Wandel, 2006).

In many cases, impacts will be felt at levels other than those at which decisions on adaptation are taken, which raises the possibility of discrepancies between perceived needs for adaptation and the resultant decisions (Keskitalo, 2008). For instance, local level administrators or entrepreneurs may perceive problems but may not have the decision-making or policy-making capacity to act on them (e.g., if taxes

and therefore funding are controlled by the state, or if the national policy framework does not allow for independent definition of local actions). Adaptive capacity is therefore defined here to include the present ability to cope (Adger, Brooks, Bentham, Agnew, & Eriksen, 2004b), as well as the capacity for extending such actions into the future using novel adaptation approaches that may be specifically tailored to a given stress (Smit & Wandel, 2006). Adaptive capacity is considered to be dependent on the underlying resources that make up the capacity to adapt to any change (a perspective in accordance with social vulnerability literature, e.g. Adger, 2000; Adger et al., 2004b), and to include coping capacities as well as the ways in which existing resources can be marshalled to deal with new stresses (for a typology, see e.g., Smit, Burton, Klein, & Wandel, 2000). Such a definition is used here as it is often difficult to draw precise distinctions between coping and more novel adaptation measures, particularly as coping may develop into adaptation as a result of innovation in existing practices (Brooks, 2003).

Thus, both measures taken within existing frameworks and emerging practices that may be re-framed as adaptation in light of an emerging adaptation problematique could be defined as adaptations. The crucial delineation would be whether these measures respond to events and occurrences likely to increase with climate change. Novel strategies and reactive or planned measures in response to potentially climate change-related events would similarly also be defined as adaptations. Adaptive capacity is thereby reflected in a unit's management of current and past stresses, its ability to anticipate and plan for future change, and its resilience to perturbations (Smit & Wandel, 2006). Improved adaptive capacity – increased by, for instance, adaptive planning, the allocation of resources in response to projected threats, and/or the identification of possible ameliorative actions – can improve an area's resilience or robustness to external stress.²

Adaptive capacity therefore requires a comprehensive understanding of the system, including its capacities in terms of decision-making and regulative (governance) frameworks on multiple levels. The adaptive capacity of different actors is generally the result of their established priorities, resources (financial, knowledge and other) and readiness for learning in response to change (IPCC, 2001). This capacity may also be increased or decreased by responses to simultaneous stresses, indicating that adaptive capacity should be viewed in relation not only to climate change, but to other stresses that impact stakeholders' adaptation decisions (such as globalising market pressures or economic transition) (Keskitalo, 2008; Smit & Wandel, 2006).

Adaptive capacity is thus a very broad concept, highlighting factors that are of importance also to determine mitigative capacity, i.e. the ability to limit emissions at the source (e.g., Kane & Shogren, 2000). A number of broad but similar frameworks try to distinguish the different determinants of adaptive capacity (e.g., Eakin

²Resilience can broadly be defined as the possibility for a system to be able to absorb disturbances while still retaining its basic functions (cf. Walker & Salt, 2006). Resilience is thereby related to adaptive capacity.

& Lemos, 2006; Smit & Pilifosova, 2001; Tol & Yohe, 2007; Leary et al., 2007). Determinants are here broadly understood as the underlying factors or components that contribute to adaptive capacity. For instance, Smit and Pilifosova (2001) define the determinants of adaptive capacity under the headings of economic resources, technology, information and skills, infrastructure, institutions, and equity. Drawing upon Smit and Pilifosova (2001) and Yohe and Tol (2001), Eakin and Lemos (2006) instead link determinants of adaptive capacity to different types of capital, such as human, organisational and social, political, and wealth and financial capital, together with factors such as information and technology, material resources and infrastructure, and institutions and entitlements.

In all of these frameworks, an important component of adaptive capacity is economic or financial resources. In a governance context, such resources may be interpreted also in relation to their impact on staffing, and thus on the ability of an administration to develop and maintain knowledge and skills on a particular issue. Financial resources may also increase or decrease in response to phenomena such as the increasing ‘hollowing out’ of the financial ability of the state in response to globalisation (cf. Rhodes, 2000). Other important resources in a governance context are leadership and political resources (e.g., Smit & Pilifosova, 2001; Eakin & Lemos, 2006) and political mobilisation, which are necessarily developed in an institutional context (i.e. within institutionalised decision-making systems that determine the distribution of resources).³ As such, the resources that exist within a decision-making body or at a particular scale may be determined through political priorities at various levels, and potentially include elements of public and media influence on these priorities (such as those described in agenda-setting literature, cf. Baumgartner & Jones, 1999). Leadership at the international level may also support actions at lower levels by influencing agendas and political priorities. The importance of such resources is highlighted more generally in political science conceptions – for example, through the truism that ‘organisation is the mobilisation of bias’ (Schattschneider, 1960, p. 71).

Closely related to such political mobilisation and political resources are issues of information and technology brokerage, or the cross-sectoral/actor capacities that serve to make processes, technologies or knowledge accessible. This highlights the fact that the existence of information and technologies cannot be assumed to imply utilisation (although they are often treated with such an implication, cf. Smit & Pilifosova, 2001); rather, information and technologies need to be made available or accessible to actors for utilisation, a requirement briefly discussed by Eakin and Lemos (2006) in terms of technology transfer and innovation capacity. With regard to the multi-level governance context, information and technology-related capacities may be associated with the successful development of ‘epistemic communities’, or policy-science communities (Haas, 1990), or with the concept of ‘knowledge

³Institutions are also seen as an independent factor in some descriptions of adaptive capacity (e.g., Smit & Pilifosova, 2001), but are discussed here within a multi-level governance and political context. Resources related to knowledge and skills or human resources (Smit & Pilifosova, 2001, Eakin & Lemos, 2006) can be seen as integrated both in this category and in other categories.

brokers' as intermediaries between science and policy (Litfin, 1994). In an institutionalised context, the broker or community may be constituted by a formal organisation, reflecting the need for 'boundary organisations' (cf. Schneider, 2009) that serve to translate scientific findings for specific target groups and associated organisations.

In addition, physical infrastructure, including access to building infrastructure, transport, water, and the extent to which these may be used to support local development and industry, is also a parameter that is used to define vulnerability and adaptive capacity. This concept relates to the idea that the protection of material resources may be a crucial issue for adaptation in developed countries (cf. Gagnon-Lebrun & Agrawala, 2008), and that access to infrastructure may serve to support and make specific types of adaptation accessible for specific groups or areas. For instance, a well-funded area with dense infrastructure and high population pressure may choose to construct tunnels or pumping systems as part of flood protection, while areas with more limited infrastructure and possibilities for development may select less costly measures or even abandon certain areas unless significant value is ascribed to them.

On the whole, decisions taken within a system will impact what has often been seen as a dimension of equity of adaptation on several levels (Smit & Pilifosova, 2001; Eakin & Lemos, 2006). For instance, in the context of measures taken to protect areas from flooding, issues of equity and fairness that potentially affect the transfer of vulnerability between actors may come into play, particularly with regard to the selection of areas to be abandoned and where measures should be focused. It should also be noted that the different types of resources interact with each other; for instance, an increase in demand and funding for an area or sector could result in an increase in the political prioritisation of that area, and vice versa. Thus, political resources may be drawn upon to marshal an extension of economic resources in the face of identified risks, while the use of economic resources will largely depend on existing priorities and policy; an array of responses, from business-as-usual to more long-term and demanding strategic adaptation responses, are then possible.

Determinants of adaptive capacity thereby touch upon a broad scope of resources, several of which may only be identified contextually and will play out differently depending on case-specific parameters.

From a political science viewpoint, the concept of capacity (and specifically policy capacity) has sometimes been defined in a way that makes it possible to draw parallels to adaptive capacity in the context of policy development. Painter and Pierre (2005) note that capacity draws 'attention to the structural characteristics and resource stocks of a governing system' (p. 3), within which policy capacity has been defined as 'the ability to marshal the necessary resources to make intelligent collective choices about and set strategic directions for the allocation of scarce resources to public ends' (p. 2). Policy capacity is thus built on features such as 'funding, managerial skills, human resource development and professionalisation in government' (p. 10), a definition that may be related to the broader definition of the political factors that affect adaptive capacity.

The concept of policy capacity is further related to the effectiveness of political and administrative structures, where more generic institutional arrangements may influence the chances of policy success in a particular field. The concept of policy capacity is therefore related to administrative capacity – the capacity to effectively manage resources for delivering governmental output – as well as to state capacity, defined as the state’s ability to mobilise resources for the achievement of public aims (Painter & Pierre, 2005). In addition, policy capacity is related not only to governmental or administrative functioning, but also to the nature of state-society exchange and the extent to which existing institutions are able to implement policy among differing constituencies and interest groups (Painter & Pierre, 2005). Jahyasuriya (2005) notes that capacity is largely the result of the ‘development of the strategic capacity of agents’ (p. 32), where new domains for governance need to be facilitated by the development of capable agents or agencies.

Capacity – both adaptive capacity and policy capacity – is thus largely related to the interaction of and prioritisation within different processes. It has been noted that policy capacity of the state could be strengthened by participation and other more inclusive forms of governance, including multiple levels of the state, to ‘enhance the capacity of a system to mobilise resources and to leverage action’ (Peters & Pierre, 2005, p. 49). However, the complexity and number of actors in multi-level governance also result in greater demands than those required of traditional hierarchical steering, which may decrease the overall capacity to govern across the diversity of levels.

1.2.3 Governance and Adaptive Capacity on Different Levels

1.2.3.1 The Role of the National Level

The mechanisms that influence governance and adaptive capacity at different levels are influenced by relevant system, level and actor characteristics. Adaptive capacity and the development of adaptation policy and measures in effect depend upon the abilities accorded to different levels within existing decision-making and market structures, which may also more broadly impact access to economic or other resources. The ability of different levels and actors to act is impacted by their positions relative to each other and by the mechanisms that govern these relations within the multi-level framework.

The role of the national level has been problematised in governance literature in particular. The state is often viewed as having become more ‘hollowed-out’ (Rhodes, 2000), often as a result of the increasingly transnational or globalised economy and the mobility of capital as well as the transfer of policy competence to other levels such as the EU. This indicates that the state must increasingly rely on steering specific actions together with other actors, for instance in partnerships with the private sector, as governments may no longer be able to ensure compliance with regulations or sufficient funding for specific measures on their own. While this may be seen as increasing participation and legitimacy by increasing the number

of participating actors, thereby potentially contributing to ‘good governance’, the other side of the coin presents a decrease in accountability, where important political, economic and social decisions may be made by others than those elected in representative democracy.

Rhodes (2000) discusses several ways of defining governance that relate to aspects of this phenomenon. One is the linkage of governance with New Public Management (NPM), defined as the increasing importance of private sector management methods such as performance measures in conjunction with the increased marketisation or contracting out of services (Rhodes, 2000).⁴ However, NPM doctrines are being implemented differently in different countries, resulting in a complex mix of their modification, supplement and strengthening according to context (Pollitt, 2006). Rhodes also defines governance through public and private networks as an emerging form of governance. This form of governance has emerged from the state’s rendering of ‘interorganisational linkages [into] a functional set of service delivery’ (Rhodes, 2000, p. 60). Governance through networks highlights that ‘government cannot impose its policy but must rather negotiate both policy and implementation with partners in public, private and voluntary sectors’ (Stoker, 2000, p. 98).

Neither NPM nor governance through networks exist in their ideal forms in reality, but rather are parts of an increasingly complex context that influences the way governance is conducted across actors and levels. The formation of governance and the operationalisation of performance measurement and networks, or the increased marketisation and devolution of power from the national level depend on differences in the national context, including the existing organisational setting, culture, and power distribution, as well as on the ways the state manages processes of change. As such, state government is not supplanted, but rather modified by the addition and influence of other mechanisms: ‘[t]he purpose for comparative analysis appears, therefore, to investigate the capacity of the centre to govern, rather than to define it away’ (Peters, 2000, p. 42). Peters (2000) further notes that variance in governance may be,

by country, with the state in some countries (Singapore, Iraq, but also the United Kingdom) having a great deal of capacity to achieve compliance from society. The variance may also be by policy arena, with governments generally being better placed to achieve compliance in areas such as defence and immigration than in policy areas with stronger domestic interest organisations. (p. 42)

Societal traditions may also differ; for instance, Scandinavia has a strong tradition of corporatism, dense networks of interest groups established especially in the labour area, and a history of working towards consensus (Peters, 2000). Similarly,

⁴New public management is generally defined by the integration of a number of neo-liberal measures, including, according to Torres and Pina (2004): ‘downsizing, privatisation, accountability for performance, replacement of input control by output control, accrual accounting, performance measurement, decentralisation, corporatisation, contracting-out, competition, management devolution’ as well as empowerment of citizens and employees and the separation of politics and administration (p. 450).