



Waters with Borders

- The Horizontal Collaboration on
Climate Change Adaptation in
Danish Municipalities

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Abstract

Climate change is inevitable and stresses countries to adapt to the changing climate through physical and institutional changes. As waters have no borders, the thesis argues that horizontal collaboration between municipalities is needed and focuses on the institutional adaptation to climate change in a Danish context. Based on theories concerning the shift from governance to government, network steering and institutions, it is examined what creates networks and how organisations are constrained by regulative, normative and cultural-cognitive institutional mechanisms.

This thesis wishes to examine the current status of horizontal collaboration and the institutional barriers and motivational forces for creating it. This is examined through a multiple case study, where interviews have been conducted with representatives of municipalities and sewer utility companies within The North Denmark Region as well as a representative of the regional authority.

The research shows that the municipalities are not collaborating horizontally at the present time, but that collaboration has been established between municipalities and sewer utility companies, mainly based on regulative and cultural motivations. In terms of institutional barriers and motivational forces, the analysis shows that both regulative, normative and cultural-cognitive barriers and motivational forces exist. These are listed in Table 15.

Based on the findings of the analysis, the discussion argues that imposing horizontal collaboration upon the municipalities through regulations is in contrast with the idea of the Danish planning system and that there is a need for normative and cultural changes within the municipalities. The normative changes should primarily happen at the political level, where attention needs to be given to the complex issue of climate change adaptation. The cultural changes should primarily happen at the administrative level, as the officials adapt climate change adaptation planning to their current culture, rather than adapting their current culture to climate change adaptation. Furthermore, it is recommended that a platform is created, possibly at the regional level, to ensure horizontal collaboration.

Preface

This thesis has been written in connection with the 4th and final semester within the Urban Planning & Management Master programme, Department of Development and Planning, Aalborg University. The research and writing of the thesis was conducted from the 1st of February until the 6th of June 2013.

The American Psychological Association 5th Edition method has been used to present the references in the report, for example (Scott, 2001). If references have the same name and year, a letter has been added subsequent to the year in the reference, for example (Scott, 2001a). The alphabetical list of references can be found in the end of the thesis.

The thesis is divided in five overall parts. Each part contains *chapters* (e.g. 4. Methodology), which contain *sections* (e.g. 4.1 Case Studies) and *sub-sections* (e.g. 4.1.1 Case Study Design).

The thesis concerns horizontal collaboration between Danish municipalities in relation to climate change adaptation. The idea behind the thesis came after we both, through previous university projects and practical work, experienced the struggles municipalities currently have to undertake climate adaptation planning, because this is a recently added subject in the formal Danish planning system. Initially, the thesis was named *Waters without Borders*, but through the research we learned that this normative perception of how climate adaptation should be seen was not the reality in which municipalities undertake their climate change adaptation planning. We therefore renamed the title of the thesis to *Waters with Borders*, as this title seemed to catch the essence of the thesis and the reality in which the Danish Municipalities work with climate change adaptation.

Acknowledgements

During the project period we were fortunate to interview representatives from six municipalities and three sewer utility companies located within the NDR, as well as a representative from the regional authority itself. As the interviewees are anonymous, we shall not mention them by name here, but would like to thank each of them for taking their time to talk with us.

Furthermore, we would like to express our sincere gratitude to our supervisor, Anja Wejs, for her support and constructive input throughout the entire process. We would also like to thank Niall Patrick Hanrahan and Karen Frederiksen for their corrections and inputs.

Finally, since this is our final thesis, we believe a few personal acknowledgements are in order to express our sincere gratitude to the people supporting us throughout our time as university students.

I would like to thank family, friends and Kevin, for their endless love and support. (Mette)

I would like to thank family and friends, however, a special thanks goes to my father, mother and Niall for their endless love and support. (Bissan)

Table of Contents

PART ONE: INTRODUCTION	1
1 Introduction.....	2
2 State of the Art: Climate Change Adaptation and Action Planning.....	5
2.1 Spatial Planning and Climate Change Adaptation.....	6
PART TWO: RESEARCH DESIGN.....	9
3 Theories of Science.....	10
3.1 Ontological and Epistemological Differences of Critical Realism and Social Constructivism	10
4 Methodology.....	13
4.1 Case Studies	13
4.2 Methods of Data Collection.....	15
4.3 Limitations of the Study	20
PART THREE: CONTEXT AND THEORY	23
5 Context of the Danish Planning System and Climate Change Adaptation.....	24
5.1 The North Denmark Region	24
5.2 The Danish Planning Act and Climate Change Adaptation	25
6 From Governing as Government to Governing as Governance: A Historical Review .	32
6.1 Governance.....	34
6.2 Institutions	38
6.3 Climate Change Adaptation Governance in a Danish Planning Perspective.....	41
6.4 Summary of the Theoretical Chapters.....	43
PART FOUR: ANALYSIS	45
7 Analytical Framework.....	46
8 Part I of the Analysis: Status.....	48
8.1 Status of Climate Change Adaptation Planning.....	48
8.2 Summary of Part I of the Analysis	53
9 Part II of the Analysis: Institutional Mechanisms.....	54
9.1 Regulative mechanisms	54
9.2 Normative Mechanisms	60
9.3 Cultural-Cognitive Mechanisms	65
PART FIVE: IN CONCLUSION.....	72
10 Discussion	73
11 Conclusion.....	81
Bibliography.....	84

List of Appendices

Appendix A: Municipality A interview transcript

Appendix B: Municipality B interview transcript

Appendix C: Municipality C interview transcript

Appendix D: Municipality D interview transcript

Appendix E: Municipality E interview transcript

Appendix F: Municipality F interview transcript

Appendix G: Utility A interview transcript

Appendix H: Utility B interview transcript

Appendix I: The North Denmark Region interview transcript

List of Acronyms

CC: Climate change

CCA: Climate change adaptation

CCAP: Climate change adaptation planning

CDR: Central Denmark Region

IPCC: Intergovernmental Panel on Climate Change

LGDK: Local Government Denmark

MCEB: Ministry of Climate-, Energy-, and Buildings

MoE: Ministry of Environment

MSP: Municipal spatial plan

NDR: North Denmark Region

PART ONE

INTRODUCTION

This first part of the thesis works as an introductory part to the thesis. It contains: Chapter 1: *Introduction* and Chapter 2: *State of the Art: Climate Change Adaptation and Action Planning*. The purpose of this part is to introduce the scope of the thesis and provide an understanding of climate change adaptation focusing on the link between climate change and spatial planning and on horizontal collaboration between local authorities.

1 Introduction

The changing climate stresses Danish municipalities to adapt their environment in order to cope with impacts caused by climate change (CC). Internationally, climate change adaptation (CCA) is recognised to both be adapting the natural and societal systems. In order for adaptation to be fully integrated into the planning system CCA calls for physical, institutional and policy changes (Füssel, 2007). These changes in the climate calls for recognising barriers and opportunities not only vertically in sectors but also horizontally across and between sectors, municipalities, authorities, institutions and actors (Lund, Sehested, Hellesen, & Nellemann, 2012; Næss, Bang, Eriksen, & Vevatne, 2005). Horizontal collaboration thus stretches across the public and the private boundaries, while vertical collaboration happens when networks stretch over different levels in public decision making (Sehested, 2009). This horizontal collaboration and the need to adapt institutions and policies are the overall theme of the thesis, focusing on the Danish context.

In 2008 CCA became a policy concern in Denmark and was governed by the Ministry of Climate, Energy and Buildings (MCEB) resulting in a national adaptation strategy advocating sectors to react in a timely manner (MCEB, 2008). After the national elections in November 2011 a new government took office and CCA was repositioned to the Ministry of Environment (MoE). A report by the MoE in 2012 called *Mapping Climate Change – barriers and opportunities for actions*, confirms that the Danish climate will gradually change. In the years up to 2050, and on a longer term, these changes will present many challenges and opportunities: The average temperature by 2050 will increase by 1.2 degrees Celsius along with a 7% increase in precipitation, especially during winter. Additionally, the sea levels will rise and have warmer and less salty waters. On the basis of this knowledge, the new government taking office in 2011 therefore launched CCA planning (CCAP) initiatives (Task Force on Climate Change Adaptation, 2012). One of these initiatives requires municipalities to prepare their own individual CCA action plans and strategies by the end 2013 (Task Force Climate change adaptation, n.d.).

The thesis takes its point of departure in municipal CCAP in Denmark. Overall, the thesis questions the sense in focusing on creating only individual municipal CCA plans, when rivers and streams run across administrative borders. If one municipality, for example, choose to use a river to receive the rising amount of water away from fields or urban areas, this could have consequences for another municipality's area further downstream in terms of increased flooding. To overcome issues similar to this, existing literature and the thesis argue that municipalities have to coordinate their efforts when adapting streams to cope with the impacts from the changing climate (Lund et al., 2012; Næss et al., 2005). Furthermore, it argues that some of the results of coordinating efforts across municipalities would result in avoiding obstructionist and conflicting efforts as well as conflicts between local authorities, and rather find synergies in efforts and investments as well as sharing knowledge and information about best practices when undertaking CCAP.

More specifically, the first aim of the thesis is to identify if there is a need among the local authorities to collaborate about CCAP. In addition to this, the thesis aims to identify the institutional mechanisms which can act as barriers as well as motivating forces for a horizontal collaboration between municipalities. These are identified to gain knowledge about what (if anything) is necessary to happen before the

municipalities can collaborate about their CCA actions. Giddens (2009) argues that CC already has been brought onto the political agenda and that it is now time to embed CC in our institutions (Giddens, 2009 in Wejs, 2013). However, integrating CC in institutions does not seem as an easy task (Bulkeley, 2010; Kern & Alber, 2009; Urwin & Jordan, 2008; Wejs, 2013). The thesis therefore examines if it is necessary to regulate municipal collaboration and how; through legislation or facilitation, or if it should be up to the local authorities to decide whether to collaborate with neighbouring municipalities in order to resolve common issues. This examination will conclude by providing recommendations for institutional changes which can enhance horizontal collaboration concerning CCA.

The thesis is built around multiple case studies with local authorities and sewer utility companies located in Northern Jutland, as well as the regional authority of The North Denmark Region (NDR). Through interviews with these different actors, it is examined what the current status on CCA is in terms of process and horizontal collaboration. Furthermore, the actors have contributed with their knowledge about what they believe could be regulative, cultural-cognitive and regulative barriers and motivating forces for an enhanced horizontal collaboration.

The overall research question of the study is thereby:

How could climate change adaptation planning in relation to flooding from streams and inlets be co-ordinated through horizontal collaboration between municipalities?

In order to answer the overall research question, the following sub-research questions are put forward to guide the research:

1. What is the state of the art of the horizontal collaboration on climate adaptation planning globally and in particular in Denmark?
2. What characterises governance in relation to Danish climate change adaptation planning, and how is it constrained by institutions?
3. What is the status of climate change adaptation planning in the interviewed local authorities, which networks have been established in relation to municipal climate change adaptation and which institutional mechanisms motivated the horizontal collaboration in the networks?
4. Which regulative, normative and cultural-cognitive constraints and motivating forces are present in relation to horizontal collaboration between municipalities?

The sub-research questions will be answered throughout the thesis. The thesis is divided in four overall parts. The first works as an introductory part to the thesis, presenting the scope of the research through the introduction and problem formulation including the research question. By integrating the newest knowledge on CCA, the first part also presents a state of the art review on CCA and climate adaptation planning, focusing in particular on the link between CC and spatial planning and on horizontal collaboration between local authorities.

Part Two contains the research design of the thesis. This part focuses on: the theories of science behind the research, the use of case studies and the methodologies used to undertake research in relation to the thesis.

Part Three begins with a short presentation of the Danish planning system and the role of CCA within this system to clarify what the national, regional and local government's tasks are in relation to CCA, and will hereby present the issue in a Danish context. Following this, the theory concerning the subject of the thesis will be presented. The section focuses on the shift from government to governance, networks and finally how institutions can constrain the latitude of organisations and networks. Part Three will thus contain the theories and concepts needed to answer the second sub-research question and create an analytical framework which constitutes the final section of this part of the thesis and which will be applied in Part Three.

Part Four constitutes the main part of the thesis. The purpose of this part is to answer sub-research questions three and four based on an analysis of the collected empirical data. The analysis will be presented in two different chapters (8 and 9). The first will focus on the status of CCA in the interviewed local authorities in terms of process and current horizontal collaboration. The second chapter will focus on the barriers and motivating forces, which can limit and enhance a higher degree of horizontal collaboration, respectively.

Part Five will act as the final and conclusive part of the thesis. The purpose of this part is to summarise, synthesise, discuss and reflect upon the findings of the prior parts of the thesis in order to answer the overall research question.

2 State of the Art: Climate Change Adaptation and Action Planning

Worldwide, CC has become recognised to be inevitable. This has led to concern about the impacts on the natural and societal systems due to growing scientific confirmation on how industrialised countries have contributed to greenhouse gas (GHG) emissions in the past 150 years (IPCC, 2007). To prevent both future and present impacts the Intergovernmental Panel on Climate Change (IPCC) differentiates between mitigation and adaptation efforts: mitigation measures are actions that aim at limiting further global climate changes by reducing greenhouse gas emissions or ensuring their sinks e.g. by changing transportation behaviour and switching from fossil fuels to sustainable energy sources and therefore aim at reducing anthropogenic (human-induced) emissions (IPCC, 2001). Adaptation measures aim at adjusting the vulnerable natural or societal systems in response to the actual and expected impacts from CC and furthermore to recognise opportunities linked to CC (IPCC, Pachauri, & Reisinger, 2007). Significantly, the capacity to do both mitigation and adaptation depends on the country's socio-economic and environmental circumstances and the availability of information and technology. (Füssel, 2007; Parry, Canziani, Palutikof, Linden, & Hanson, 2007; Zamzam, Tommerup, Okunda, Mann, & Sucha, 2011).

The result of CC efforts should be to protect existing, near future and future natural and societal generations from CC impacts. Hence both mitigation and adaptation efforts should be undertaken. At the national and international levels, while strong conflicts remain, there is a general agreement about what steps need to be taken to reduce greenhouse gas emissions. Even at the local level, with the widespread acceptance of Local Agenda 21 and the influence of the International Council for Local Environmental Initiatives (ICLEI) in encouraging municipalities to first inventory and then plan to reduce their greenhouse gases, some consensus on appropriate actions is clear, although certainly there is not enough actual action locally, nationally, or internationally to meet the target reductions in emissions (Hamin & Gurran, 2009).

What has become increasingly apparent in the last two or three years is that because we have not acted fast enough to reduce emissions, the accumulation of greenhouse gases in the atmosphere to date means that significant changes in the global climate are already unavoidable. Mitigation and adaptation must be treated as twin issues, as noted by the Intergovernmental Panel on Climate Change (IPCC) in their Fourth Assessment Report (Hamin & Gurran, 2009; IPCC et al., 2007). However, knowledge within mitigation compared to adaptation is better established in terms of, for example, cost and effectiveness (G. R. Biesbroek, Swart, & van, 2009; Grothmann & Patt, 2005; IPCC et al., 2007). This is due to the fact that the scientific and political attention has mainly been on mitigation and that adaptation has only recently entered the scientific and political arenas (G. R. Biesbroek et al., 2009; Wejs, 2013). Countries have mainly focused on mitigation since the release of IPCC's first assessment report in 1990 until the fourth assessment report in 2007 {{336 Biesbroek,G.R.; 2474 Wejs,Anja 2013}}. The countries have been focused on fulfilling the commitments set by the United Nations Framework Convention on Climate Change (UNFCCC) through the Kyoto Protocol¹ (G. R. Biesbroek, 2010; G. R. Biesbroek et al., 2009). Furthermore, other authors such as Füssel (2007) argue that it is much easier to do mitigation than adaption. Mitigation efforts also address issues concerning sustainable development

¹ The Kyoto Protocol expired in 2012.

mainly focused on transitioning from fossil fuels to e.g. wind power to reduce GHG emissions (Füssel, 2007; Zamzam et al., 2011).

However, in the past years researchers and practitioners have steered their attention to CCA recognising that the present and predicted extreme weathers require attention (Task Force on Climate Change Adaptation, 2012). These extreme present weathers, such as heat islands, increased frequencies of precipitation and stronger winds not only calls for physical adaptation but also institutional adaptation to create space for governmental and non-governmental organisations to interact, collaborate and coordinate efforts within and across organisations in networks. Adaptation can be undertaken through adapting physical systems from the bottom-up or top-down depending on the governing system.

Furthermore, it is also argued that with the publication of the European Commission's green paper in 2007 and the white paper in 2009, both dealing with adaptation to CC and options to adapt, the European Union acknowledged the need to undertake adaptation strategies in the member countries (G. R. Biesbroek et al., 2009). This has led to national responses firstly by adopting and implementing national adaptation strategies acknowledging that even with successful mitigation efforts, present and near future CC, i.e. 50-100 years' time, has to be dealt with now (W. N. Adger & Barnett, 2009; G. R. Biesbroek et al., 2010; Füssel, 2007; IPCC et al., 2007; IPCC, 2011; Juhola & Westerhoff, 2011).

Adaption to CC is thus dealt with on a national, municipal and local level. It has also led to researchers and practitioners sharing experience and knowledge through various networks on trans-national levels such as the first European Climate Change Adaptation (ECCA) conference in Hamburg.

Seen from a national planning perspective, adapting to CC first of all means to implement CCA strategies on a national level, with an aim to inform the affected sectors. Secondly, it means to advocate, legislate and regulate actions on a municipal level on how to deal with CCA measures on a local level, which is what is happening in Denmark currently, with the present preparation of municipal CCA strategies and action plans (see section 5.2). However, since CCA actions are new to the Danish planning system, CCA in this context does not only mean physical changes, it also and foremost means institutional changes as it is advocated by (Füssel, 2007). He argues that CCA is also to be considered as an adaptation of the institution and policies, a view which is supported by the IPCC (IPCC et al., 2007). In addition to this, the following section seeks to gain an understanding of how CCA is integrated into spatial planning.

2.1 Spatial Planning and Climate Change Adaptation

CCA in Denmark is generally placed within spatial planning (Lund et al., 2012). According to Pløger (2001), spatial planning is by tradition organised in government systems that operate with a firm hierarchical order that divides tasks and competences between different governmental levels and has a clear boundary between public and private actors (Lund et al., 2012; Pløger, 2001). However, there are many aspects as to what spatial planning is. Healey (2006) presents spatial planning as sometimes promoting and accommodating economic activity, whilst at other times spatial planning regulates the economic activity in order to safeguard other values such as the environment or securing social justice (Healey, 2006).

CCAP on a local level is argued by many researchers to be a common issue. According to Lund et al. (2012), CCAP is narrowly defined in municipalities. Firstly, they are reduced to be only about water-management systems. Secondly, initiatives and implementation are taking place in the technical departments. Lund et al. (2012) therefore call for cross-sector collaboration and to aid the municipalities in their efforts (Lund et al., 2012). Bulkeley (2010) adds to this discussion that local authorities have a very important role to play when it comes to CCAP. In this context, Bulkeley (2010) is referring to the important role to co-ordinate and facilitate CCAP (Bulkeley, 2010). However, experiences from Sweden and Norway show that governance of CCA on a local level is challenged mainly by: 1) the lack of knowledge of what to adapt; 2) land-use conflicts; 3) the lack of taking responsibility to adapt; and 4) rarely recognising the potential of integrative planning (Lund et al., 2012; Næss et al., 2005). Lund et al. (2012) argue that the municipalities are lacking guidance from the state level in terms of what role the municipalities play in CCAP (Amundsen, Berglund, & Westskog; Lund et al., 2012).

By including other professionals in other sectors, researchers, citizens and companies, there will be an opportunity to contain resources that have not yet been fully involved. This involvement will then stimulate inter-municipal and cross-sectorial collaboration and result in production of adaptation measures with added value. In practice and in relation to CCAP, added value arises when measures in one sector contribute to measures in other sectors. This can be sought through collaboration to learn how other members from different policy sectors establish a common frame of reference to influence their problem-solving activities (Lund et al., 2012; Storbjork, 2010). In other words collaboration in the form of co-operating through networks can help the municipalities in solving common issues, for example, in managing cross-municipal border streams.

PART TWO

RESEARCH DESIGN

The second part of the thesis presents the research design of the thesis. It contains: Chapter 3: Theories of Science and Chapter 4: Methodology. The purpose of this part is to introduce the thoughts behind the research and research design. Through theories of science, the thesis' stands on ontology and epistemology are presented applying critical realism and social constructivism. The Methodology chapter presents the use of a multiple case study and the qualitative methods applied to undertake the research of the thesis.

3 Theories of Science

To gain knowledge and to work with scientific issues can be done in many different ways. The following chapter will present the theories of science that lie behind the preparation of this thesis, as “*theory of science gives us a tool to reflect on our own practise*” (Hansen & Simonsen, 2007). Though partially termed *science*, theories of science are not concerned with gaining knowledge, but are rather a reflection on how knowledge is gained and which preconditions are present when undertaking science (Buch-Hansen & Nielsen, 2005; Hansen & Simonsen, 2007).

The thesis is prepared using two somewhat similar but differing theories of science; critical realism and social constructivism. In relation to their connection, Buch-Hansen & Nielsen (2008) argue that critical realism can be seen as a moderate form of constructivism, however having a more including perception of what exists in the world and how it exists (Buch-Hansen & Nielsen, 2005). The difference between critical realism and moderate forms of social constructivism lies within the two strands’ perceptions of ontology and epistemology, and also in regard to conflation. In the following section these differences will be presented in short before placing the thesis within the two strands.

3.1 Ontological and Epistemological Differences of Critical Realism and Social Constructivism

Ontology can be referred to as *the theory of being*; what exists in the world and how it exists. It is thus concerned with how we perceive and look at the world. Epistemology is the *theory of knowledge*; what can we know about the world and how? Epistemology is thus more concerned with how knowledge of the world is gathered (Buch-Hansen & Nielsen, 2005; Hansen & Simonsen, 2007).

This thesis deals mainly with the social world concerning the concepts of structure and agency, however, the problem area of the thesis takes its point of departure in natural events caused by CC. For this reason the most radical stance within social constructivism advocating that the social and physical worlds are socially constructed is abandoned. As acknowledged by critical realists, the thesis will consider merely the social world and our knowledge about it as socially constructed. This is the essence of this view on social constructivism; that the social institutions and facts only exist because we believe they do. Hereby, the social world is constructed through definition processes in collective social interactions. In relation to critical realism, Hansen & Simonsen (2007) point out that:

“It is actually possible to unite critical realism and social constructivism, when the latter is shaped by a thesis about, that our access to existing (physical and social) surroundings is affected by social circumstances in the research society and in society as a whole as well as the accessible theories and concepts” (Hansen & Simonsen, 2007)

Connecting this quote to this thesis, the theoretical and empirical parts are influenced to a high degree by the discourses, theories and concepts created within the research society concerning CCA and governing structures present in the Danish society today. Society as a whole is furthermore affecting how the issues are approached, for example in terms of how CC and CCA is becoming a growing socially constructed subject of concern in the public administration and to a degree also in the public in general. The

inclusion of social constructivism and critical realism approaches to research, allows the researcher to reflect on the socially constructed world concerning, for example, governing structures in Danish climate adaptation planning to identify the mechanisms behind the actors' perceptions of the issue and why they act the way they do.

The ontology of critical realism includes what is referred to as the *three domains of reality*; the empirical, the actual and the real, illustrated in Table 1.

Table 1: The three domains of reality (Buch-Hansen & Nielsen, 2005) and ((Leca & Naccache, 2006) in (Wejs, 2013))

	The empirical domain	The actual domain	The real domain
Observations			
Events and phenomena			
Structure, mechanisms and causal powers			

The empirical domain consists of experiences and observations and is data that comes from the researcher's interpretation of actual events. In this thesis, this domain is examined through literature studies of policy documents as well as through interviews with relevant actors in relation to CCAP to, for example, examine how the local authorities perceive their role in the task of undertaking CCAP. *The actual domain* encompasses the content of the empirical domain, but adds on all existing events and phenomena, no matter if they are experienced/observed or not. The actual domain "refers to what happens when [...] powers [of objects, ed.] are activated, to what they do and what eventuates when they do" (Sayer, 2000). In relation to this thesis, the examination of the actual domain is undertaken when asking actors in interviews why they are beginning to undertake CCAP, by asking, for example, which motivational forces have been in play for them to start undertaking CCAP. Finally, the third domain of reality (*the real domain*), in addition to the previous contents, also contains structures, mechanisms, causal potentials and dispositions, which together may create the events, phenomena, experiences and observations from the previous two domains. The real domain is what distinguishes critical realism from other theories of science (including social constructivism) by arguing that the two previous domains do not explain how things are connected in the world. There is a need to look at which (combinations of) mechanisms and, ultimately, structures act as causal powers to create events and how they create them. In relation to the real domain, the thesis, for example, examines which structures and mechanisms could prevent or encourage the local authorities to work together on CCA. For example, it is examined in the analysis which institutional settings the actors are a part of and how these settings influence their observed behaviour and perception of their role.

In relation to the ontology of critical realism including three domains of reality from the empirical to the actual to the real, social constructivists focus on the empirical domain.

In the analysis of this thesis it is the aim to reach the actual and the real domain with a focus on events and structures. Social constructivists also work with structures, but contrary to critical realists they argue that structures and agency co-exist due to their focus on ontology. Where critical realists believe that the structures pre-exist the actors and have different causal powers, because structures exist over long periods of time and are a result of past actions, social constructivists believe that structure and agency share the characteristics of one another, and cannot be seen as two different entities. This is referred to as *conflation*. In regards to epistemology, critical realists perceive gained knowledge as something temporary and context dependent. The mechanisms of the real domain which influence the events are context-dependent; all mechanisms may not always be activated in different situations. In addition to this, a critical realist does not believe that the causal power will always have the same effect in different contexts (Buch-Hansen & Nielsen, 2005; Wejs, 2013). Rather *“causal regularities [can] merely be understood as tendencies, and tendencies work at the real domain – no matter if they get actualised or experienced”* (Buch-Hansen & Nielsen, 2005). There is no final truth from a critical realist perspective; rather the knowledge gained through research can change character when further research is undertaken.

In the context of this thesis, the knowledge gained can thus be characterised as a snapshot of the current situation concerning CCAP in a Northern Jutland context, however if research was undertaken in a different context, further or other results could appear.

In the thesis, structures and actors are seen to co-exist at the given time of the interviews, taking the social constructivist approach to structure and agency. The answers given in the interviews undertaken in relation to the thesis are therefore used to provide an image of the structure in which the interviewee works, rather than as an image of the interviewees' personal opinions. However, the ontology of critical realism is still relevant in the thesis, as it aims to understand how the phenomena, events and structures of the actual and real domains can influence the behaviour of actors, i.e. which structures act as barriers and motivating forces to horizontal collaboration. This is seen in the interview guide, where some questions are related to the actual and real domain from critical realism, for example questions such as “Is there culture to collaborate with other municipalities in your planning in general?” and “What can enhance a horizontal collaboration between municipalities?”. The aim with these questions is to gain an understanding of why the municipalities work in the way they do, i.e. to understand the current characteristics of the structure in which the local authorities work. In terms of epistemology, the thesis only uses a qualitative method, which is in line with both critical realism and social constructivism. Critical realists, however, approve of all methods and mixed method approaches, which can be criticised for affecting the transparency of the methods applied and hereby the validity of the research negatively. The reason for choosing only one qualitative method will be elaborated in the following chapter, concerning the methodologies applied in the research behind the thesis.

4 Methodology

The following chapter will focus on the methods used in the preparation of this thesis. This is done by presenting the ways in which theoretical and empirical knowledge is gathered as well as analysed and linked together throughout the thesis. Firstly, the thesis' use of a case study will be presented in order to understand the characteristics and discuss the use and the generalisability of case studies. In order to assess the quality of the case study research design, Yin (2009) argues that the researcher can examine validity and reliability of the research. This examination will be carried out in this chapter to discuss and highlight the methodological and epistemic considerations of the case study (Yin, 2009). Finally, *Methods of Data Collection* will present and reflect upon the methods used to conduct the research behind the thesis.

4.1 Case Studies

The key element in the empirical research undertaken, in relation to the thesis, centres around a case study. This approach is chosen as it allows a detailed and intense analysis of a complex issue affected by multiple variables (Bryman, 2008). Yin (2009) recommends using a case study as a method of research when the studied issue focuses on contemporary as opposed to historical events over which the researcher has little or no control and when the research question is addressed with *how* or *why* questions (Yin, 2009). The strength of the case study as a method of research lies in its ability to deal with various forms of qualitative and quantitative data in a single frame. The qualitative data could, for example, be documents, interviews, and observations while the quantitative could be surveys and experiments (Yin, 2009). As stated in the theories of science chapter, the epistemological approach to the research of the thesis is to use qualitative data.

4.1.1 Case Study Design

In this thesis a multiple case study method is used applying a holistic case study design. Figure 1 illustrates the principle of the embedded case study design and how it is applied in the thesis.

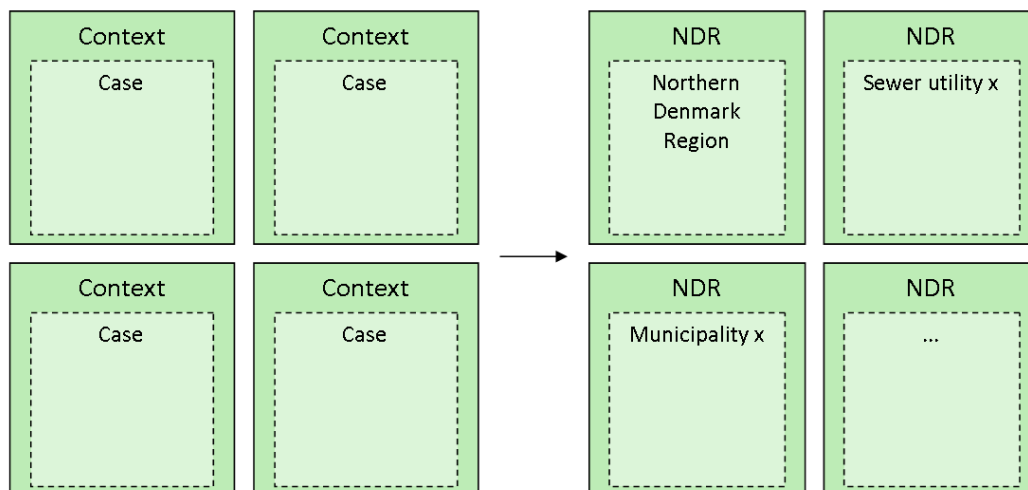


Figure 1: The holistic multiple case study design (Yin, 2009)

As Figure 1 illustrates, the local authorities and sewer utility companies interviewed in relation to the thesis are viewed as individual cases within the context of the NDR, forming a multiple case study design. The multiple case study approach is chosen due

to the subject of the research. As the thesis is concerned with collaboration between multiple actors from different organisations, basing the thesis on a multiple case study is a natural choice in order to get several perspectives on the subject from the different parties potentially involved.

4.1.2 Generalisation

In case study literature, the results emerging from a multiple case study design are often considered to be more compelling than the results arising from a single case study (Yin, 2009). This leads to a discussion of the generalisability of the results from the thesis. The cases chosen for this thesis are considered to be somewhat representative of Danish municipalities, sewer utilities and regional authorities in general. As illustrated in section 5.1 the municipalities have different characteristics, ranging from being outer (*yder*) municipalities to being rural and urban municipalities, however with the vast majority being either outer or rural. Through undertaking the case studies, it has become clear that the issues concerning CC facing the rural and outer municipalities are of a different character than the issues facing the urban municipalities. Because there are a high number of the outer and rural municipalities in this study, the generalisability of the case study can therefore be questioned, if one wanted to use the results in an area characterised by urban municipalities. However, the thesis is more concerned with institutions, planning processes and structures rather than issues related to a specific geographical area. On the basis of this, the results of the thesis could be generalised, as the organisational layout of the Danish municipalities is similar all over Denmark and they operate in similar regulative and cultural structures. In terms of this however, it is important to note that the results are found at a time where CCA is new in Denmark. The findings may therefore differ if a similar study is made in the future when CCA potentially has become a more well-known subject within the municipalities and society in general.

4.1.3 Validity and Reliability

Bryman (2008) defines validity to be referring to *“the issue of whether an indicator (or a set of indicators) that is devised to gauge a concept really measures that concept”* (Bryman, 2008). Yin (2009) distinguishes between three kinds of validity: *construct validity, internal validity and external validity*. Each kind contains tactics or tests which can be used during the research process, in order to secure validity. The three kinds of validity, as well as reliability, will be presented below and related to the composition of the thesis.

The construct validity focuses on identifying and using the suitable measures for the studied concepts and takes place during the data collection and composition phases of the research. The internal validity focuses on seeking a causal relationship between events, where certain conditions lead to other conditions, while the external validity focuses on defining the degree to which the results of the research could be generalised.

Reliability *“refers to the consistency of a measure of a concept”* (Bryman, 2008). Reliability focuses on that the researcher should demonstrate that the different operations of the study (for example the data collection procedure) are able to be repeated, resulting in the same outcome (Yin, 2009). Table 2 illustrates the different tactics or tests which have been undertaken in relation to securing validity and reliability in this thesis, as well as the approaches used in the thesis.

Table 2: Focus points in construct validity and the approach used in the thesis (Yin, 2009)

Focus points applicable to this research	Approach used in thesis
<i>Construct validity</i>	
Use multiple sources of evidence	It has been sought to interview as many relevant local authorities as possible, as well as the regional authority and a sufficient number of sewer utility companies
Have key informants review draft of case study report	The used interviewee quotes are e-mailed to the participants for approval
<i>Internal validity</i>	
Do explanation building	The case wishes to explain the need, barriers and opportunities for a higher degree of horizontal collaboration between local authorities through causal links between governance and institutions
<i>External validity</i>	
Use theory in single-case studies	The case study is built upon broad theories on governance, networks and institutions
<i>Reliability</i>	
Use case study protocol	The thesis constitutes the case study protocol, including a description and reflection of the research methods applied
Develop case study database	The interviews are recorded and transcribed

The table illustrates that it has been sought to create validity and reliability during the preparation of the thesis through different methods.

4.2 Methods of Data Collection

This section will provide an overview of the methods used during the project period in preparation of the thesis. Literature studies, including document studies and a literature review as well as interviews undertaken in connection with the chosen case studies constitute the methods applied in the preparation of the thesis. These methods will be elaborated in the following sub-sections. The first sub-section focuses on the collection of theoretical data, i.e. literature studies, while the second sub-section focuses on the collection of empirical data through semi-structured interviews.

4.2.1 Theoretical Data Collection

The theoretical part of the thesis and the state of the art in Part One of the thesis, have been based on literature studies. The literature studies have been performed throughout the project period as different focuses have emerged in researching the subject and

carrying out the empirical work. The state-of-the-art literature review focuses on CCAP in an international context and focuses on the governance of CCA, rather than on the practical and technical sides of the issue. The theoretical part of the thesis includes the context of the Danish planning system and is carried out as a document study based on planning and policy documents, and relevant information from government websites. This chapter and the theory chapter broaden the scope in that they are looking at society as a whole before examining CCA's role. In Theory, the focus is on the shift from government to governance in society in general and how this can be interpreted in a CCA context. Furthermore, a main focus in the theoretical part is on institutions and how they constrain governance.

For the literature studies, data has been collected using: peer-reviewed articles, books, policy documents from national, regional and local levels as well as governmental homepages. These different types of literature have contributed to the understanding of CCA, governance, network steering and institutions.

4.2.2 Empirical Data Collection

The empirical part of the thesis is based on semi-structured interviews undertaken in relation to the chosen case studies. In addition to this, the authors have participated in the European CCA Conference (ECCA) in Hamburg in March 2013, and in a meeting between Hjørring Municipality and the government's task force Travel Team. During these two events, empirical data have also been gathered. The following paragraphs will introduce how knowledge was gained during these two events and will first and foremost discuss the semi-structured interview method. The section will therefore be divided in four steps. The first step deals with the data gathered from the ECCA and the travel team events. The second step presents the pre-interview thoughts through the choice of interview approach, the preparation of the interview guides and the choice of interviewees. The third step will present the approaches used during the interview itself, while the fourth and last step will deal with the handling and analysis of the gathered data subsequent to the interviews.

Participation in the ECCA-conference and the Climate Adaptation Travel Team Meeting

The ECCA conference was held in Hamburg in March 2013 and, through participating in the conference, the authors obtained knowledge about the most up-to-date international knowledge on climate adaptation. The conference focused on the interaction between researchers and practitioners through seminars, workshops and panel discussions. The authors participated in both research and practitioner seminars as well as the panel debates. The knowledge gained here, contributes to the state of the art review on CCA and provided the authors with an overview of the different focuses and complexities in dealing with CCA, both in research and practice.

The authors participated in the meeting between Hjørring Municipality and the government's Climate Adaptation Travel Team in relation to the interview with Hjørring Municipality in March 2013. The task of the Travel Team is to guide municipalities in the initial phase of the CCA process by introducing different tools, providing advice and answering concrete questions. The observations made here are not directly used in the thesis, however, the meeting was a good opportunity for the authors to gain an insight into how the government is trying to guide the municipalities, what their focus is and which issues the municipalities are dealing with at the moment

when undertaking CCAP. Participating in the meeting thereby provided the authors with a broader understanding of the studied issue.

Pre-interview: The Choice of Interview Type, Preparation of Interview Guides and Choice of Participants

The following deals with three different subjects: the choice of interview type, the preparation of interview guides and the choice of interview participants.

Interviews can be categorised into different types in relation to the degree of structuring in the preparation of the interview, from being a structured interview, to a semi-structured and unstructured/open ended interview (Bryman, 2008; Kvale, 2007). In this thesis, the semi-structured interview is the chosen approach. This approach is chosen because of its characteristics:

“It [the semi-structured interview] has a sequence of themes to be covered, as well as some prepared questions. Yet at the same time, there is openness to changes of sequence and question forms in order to follow up the answers given and the stories told by the interviewees” (Kvale, 2007)

In the preparation of the thesis, it was prioritised that certain themes and questions were asked to secure a comparability and synthesis of the answers given, while allowing follow up questions and the interviewees to emphasise what they believed was relevant knowledge about the issue. To secure that the essential themes and questions were covered through the interviews, interview guides were drawn up in the preparation of the interviews. Two different interview guides were prepared; one for the local authorities and sewer utility companies and one for the regional authority. As seen in Appendix A-H, the two interview guides are very similar. This is a natural outcome as the overall themes of the interview guides are the same to secure comparability and help to strengthen the internal validity.

Interviews can also be categorised as narrative interviews, factual interviews, focus group interviews or confrontational interviews (Kvale, 2007). In the preparation of the thesis, each interview undertaken is a mix of a factual, narrative and confrontational interviews, as can be seen in the interview guide. This mix of interview types results in a more holistic and deeper understanding of the studied issues and gave the interviewees an opportunity to reflect upon their knowledge, adding more nuances to their responses.

The authors wished to gain *factual* knowledge about the position of the interviewee and his/hers role in climate adaptation planning, the status of the CCAP process, which scenarios the different local authorities are using in the process, and who they are currently collaborating with on CCA. These questions were asked at the beginning of the interview in order to start off the interview with some soft introductory questions. This was designed to create a relaxed atmosphere and get the participants talking about concrete subjects, in which they have confidence and immediate knowledge. The *narrative* approach to the interviews can be seen in the remaining parts of the interview guide. Here, the aim was to encourage the interviewees to reflect upon the need, motivating forces and barriers for future horizontal collaboration between local authorities by asking for examples and reflections about the subject. Finally, the *confrontational* approach to interviews cannot be tracked directly in the interview guide, but were used as sometimes provocative follow-up questions throughout the interview,

questioning the answers of the interviewees. This approach created further narrative examples and reflections from the interviewees and encouraged them to sometimes reconsider their previous answers. For example, if an interviewee from a local authority stated that they did not have any reason to collaborate with others, because they are not affected by the actions of other local authorities, it was asked if they did not feel a responsibility for the local authorities they could potentially affect.

In relation to the choice of interviewees, interviews have been conducted with relevant professionals from six local authorities, the NDR and three sewer utility companies.

The interviewees are listed in Table 3. Interviewees from municipalities are coded with an M and interviewees from sewer utility companies are coded with a U. The subsequent letters (M:A-F and U:A-C) are the same coding used in the analysis.

Table 3: Conducted interviews

Interviewee	Position	Role in preparing the climate adaptation plan	Interview	Remarks
MA	Head of Environmental Department	Responsible	Face to face	
MB	Employee in the Wastewater Department	Responsible	Face to face	
MC	Head of Planning Department	Employees prepare the climate adaptation plan	Face to face	Interview conducted together with UC
MD	Employee in Water and Soil Department	Responsible	Face to face	
ME	Head of Nature and Environmental Department	Responsible	Telephone interview	
MF	Employee in Planning Department	Responsible	Face to face	
UA	Department Engineer	Involved in climate adaptation mapping	Face to face	
UB	Interviewee 1: Director Interviewee 2: Engineer	Involved in climate adaptation mapping	Face to face	Two interviewees
UC	Part time employee	Involved in climate adaptation mapping	Face to face	Interview conducted together with MC
NDR	Employee in Regional Development	Contact person for the municipalities	Face to face	

The table shows that nine interviews were conducted in relation to the study with representatives all involved or responsible for CCAP within their given organisation. Seven out of the nine interviews were made with a single person, while one interview (MC and UC) included both a representative of a local authority and a representative of the sewer utility, and one interview (UC) includes two representatives from the same

sewer utility company. Eight out of nine interviews were conducted face to face, while one interview was conducted over the telephone.

The interviewees were chosen on the basis of their role in CCAP. It has been sought to conduct interviews with representatives working directly with the subject either as project managers or as the person in charge of the subject, as they have the biggest knowledge within the different organisations.

Figure 2 illustrates which local authorities and sewer utility companies have participated in the research through interviews.

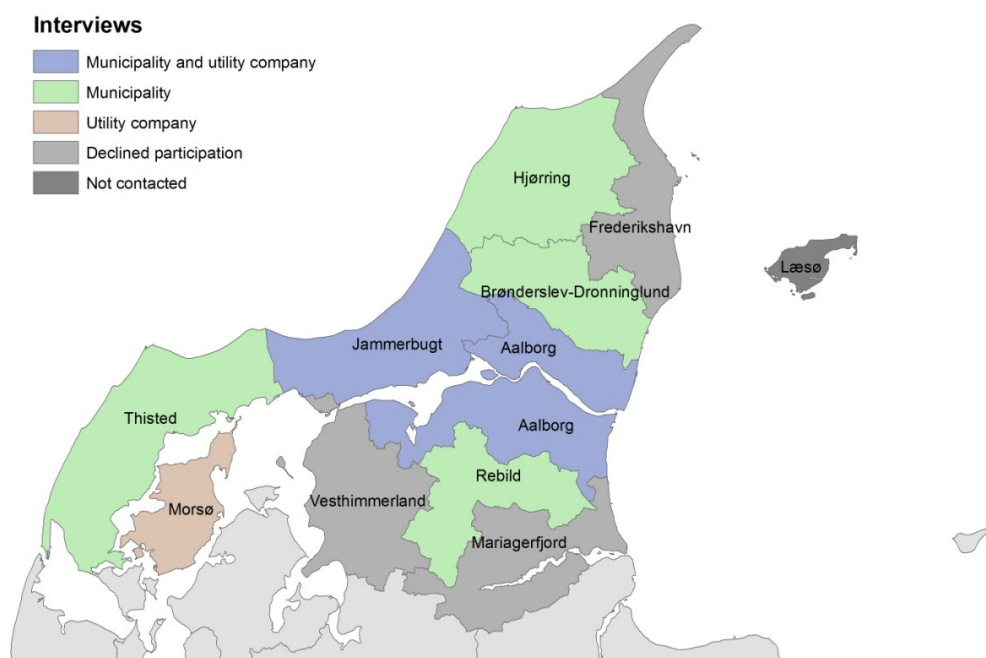


Figure 2: Interviewed local authorities and sewer utility companies (own figure).

The map shows that three local authorities in the NDR declined participation though contacted by the authors. Two of these did not reply to emails or phone calls, while one did not find it relevant to participate in the research. The last local authority of the NDR (Læsø) was not contacted, as this local authority has no direct interest in collaborating with other local authorities about CCA due to its location. This claim was supported by several of the interviewees during the interviews.

The interviewees were invited to participate by emails describing the focus of the thesis, and what the interviewees could contribute, in order to give them a pre-understanding of the issue and potential time to reflect about the subject before the interview was carried out. Furthermore, the email underlined the importance of their knowledge to the research, giving them an incentive to participate in the study. Some interviewees did not reply to the email and were therefore contacted by telephone, which led to a higher number of participants.

Conducting the Interviews

The interviews themselves were carried out between the 11/3 and the 17/4 2013. The interviews were conducted in Danish, as this created a more natural interview situation

and allowed the interviewees to speak freely and add more nuances without worrying about language barriers.

Eight out of the nine interviews were undertaken face-to-face in the location of the different local authorities and sewer utility companies. At the face-to-face interviews, both authors were present. One of the authors was appointed to make sure that the questions of the interview guide were asked during the interview, while the other interviewee asked the main part of the follow-up questions and took the role of asking the main part of the confrontational questions. The last interview was conducted over the telephone due to a need to save time and was carried out by one of the authors in order to prevent confusion for the interviewee.

It was prioritised to carry out the interviews face-to-face as this allowed the use and interpretation of body language (Bryman, 2008). Furthermore, it allowed the authors to gain a more personal contact with the interviewee than if they were carried out over the phone. Finally, a couple of the interviewees brought relevant material to the interviews which illustrated their current work on CCA.

The interviews took between 30 min and 1.5 hours and were all recorded, with the consent of the interviewees, in order to be able to transcribe them later on. The sound files are not available to the reader as some of the representatives asked not to be quoted on certain statements during the interviews.

Post-interview: Transcribing and Anonymity

As mentioned, the interviews have all been transcribed after they were carried out in order to be able to gain an overview of the achieved information and to use direct quotes from the interviewees in the thesis. Following this, quotes of the transcripts have been coded using web-based software (Dedoose) to divide them into different subjects according to the interview guide and the analytical framework. This gave a good overview of relevant quotes relating to the studied themes.

It has been decided and agreed with the interviewees that they should remain anonymous. This choice was made as the interviewees are able to speak more freely when they are not held to account for their statements. In addition to this reason, it has not been the purpose of the study to expose one or more local authorities but rather to create a general image of the current situation and attitudes toward horizontal collaboration of CCA amongst the local authorities.

4.3 Limitations of the Study

The following section will reflect upon some of the choices made in the research process, which could potentially limit the study. It will thus argue for the choices made and how the potential issues relating to these choices have been sought to be overcome.

Relating to the theoretical literature review, it has been sought to use a sufficient amount of different relevant and recognised sources. Due to time constraints and the wish to create a precise and concrete literature review, it has not been possible to include all relevant sources in the literature review. Furthermore, the literature review concerning institutions is mainly based on one source, Scott's book *Institutions and Organisations*. The use of just one source can limit the study. However, the book provides an outline general image of institutions primarily within social research and, in

particular, what makes and sustains institutions, which is very much relevant in the context of the thesis. Thus, the theory by Scott presented in the literature review plays a major role in setting up the analytical framework of the thesis. It has however been sought not to limit the analysis to only consider the parameters (i.e. the three pillars of institutions) which Scott sets out in his book, when the findings of the analysis are incompatible with the theory.

Another potential limit in the study lies in only choosing the local authorities in the NDR. One can claim that the choice of interviewees goes against the very point of the thesis: that waters run across administrative borders. It can thus be argued that other local authorities located in connection with, for example, the Limfjord, should have been invited to participate in the research instead of being ruled out by the fact that they are located within another regional authority (i.e. The Central Denmark Region). In addition to this, a higher number of interviews could have strengthened the study. However, this approach was chosen because the initial idea behind the project was to examine if the regional authorities could play a bigger role in co-ordinating or preparing a regional climate adaptation strategy concerning issues affecting multiple local authorities. This could, for example, have been streams running through multiple authorities or the Limfjord. Due to time constraints, it was therefore chosen to only focus on one regional authority.

PART THREE

CONTEXT AND THEORY

The third part of the thesis presents the context in which the thesis operates as well as a theoretical review. It contains: Chapter 5: *Context of the Danish Planning System and Climate Change Adaptation* and Chapter 6:

From Governing as Government to Governing as Governance: A Historical Review The purpose of this part is firstly to introduce the Danish planning system focusing on the integration of climate change adaptation. Secondly, the aim is to provide a historical review on the change from *government* to *governance*, focusing on network steering and on how institutions can constrain the actions of actors

5 Context of the Danish Planning System and Climate Change Adaptation

Scandinavian planning authorities function through a formal system guided by Planning and Building Acts (PBA) formed on procedural treatments of the public interest. Furthermore, the PBA prescribes institutional hierarchies of decisional power i.e. plan processes, legitimacy of plans, and participator rights and thus regulates the societal form and collaborative practice of planning (Ploger, 2001). Hence, Scandinavian public planning unfolds within the institutionalised system, its rules of practice and its ways of thinking and practicing i.e. planning regimes. Therefore, it is important to give a general description of the Danish spatial planning, CCA in spatial planning and collaboration in spatial planning. This is briefly summarised in the following sections.

This chapter presents the chosen case of the North Denmark Region (NDR) and the affiliated municipalities. It provides a context of the demographics of the area as well as the concepts that characterises the municipalities in the region. Furthermore, it provides the reader with the context of the Danish planning act and how CCA is integrated into it.

5.1 The North Denmark Region

The NDR is geographically located in the most northern part of Denmark i.e. the northern part of the Jutland peninsula. The region consists of 11 municipalities: Hjørring, Frederikshavn, Brønderslev-Dronninglund, Thisted, Jammerbugt, Aalborg, Morsø, Vesthimmerland and Mariagerfjord, shown in Figure 3.



Figure 3: The location of NDR and the municipalities of NDR (own figure).

The municipalities are characterised differently in regard to whether the municipality is an urban, rural or outskirts municipality (MFAFoD, 2011). Figure 4 illustrates that the NDR has one urban municipality, six rural municipalities and four outskirts municipalities. These categorisations will be used throughout the analysis to differentiate between the municipalities in the region.

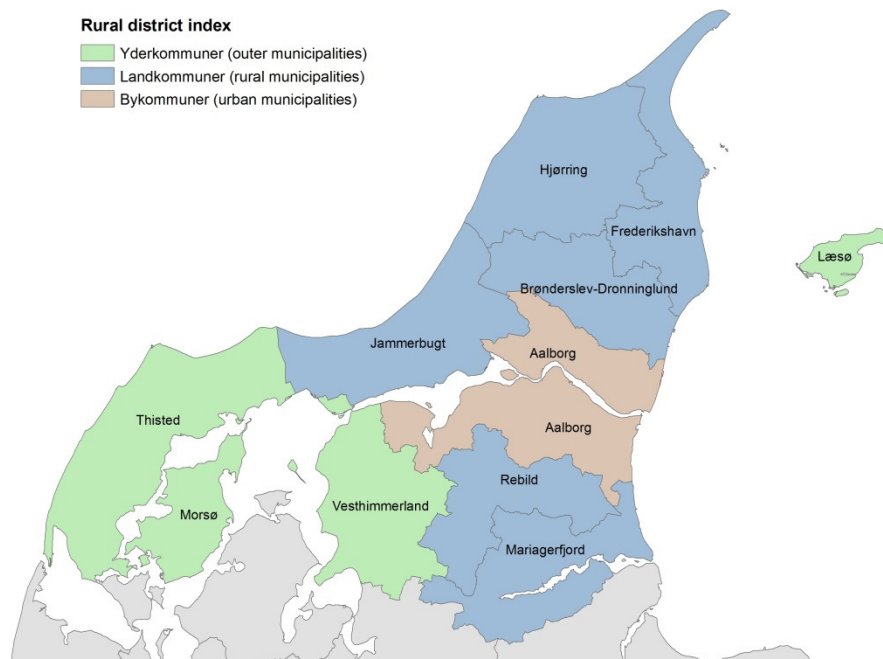


Figure 4: Rural district index (own figure based on (MFAFoD, 2011)).

5.2 The Danish Planning Act and Climate Change Adaptation

The Danish Planning Act is aimed to ensure that comprehensive planning on a national, regional and local level unites the societal interest in spatial planning and contributes to protect the national nature and environment. Hence, the societal development should be sustainable and in respect to human needs and the natural environment (COMMIN).

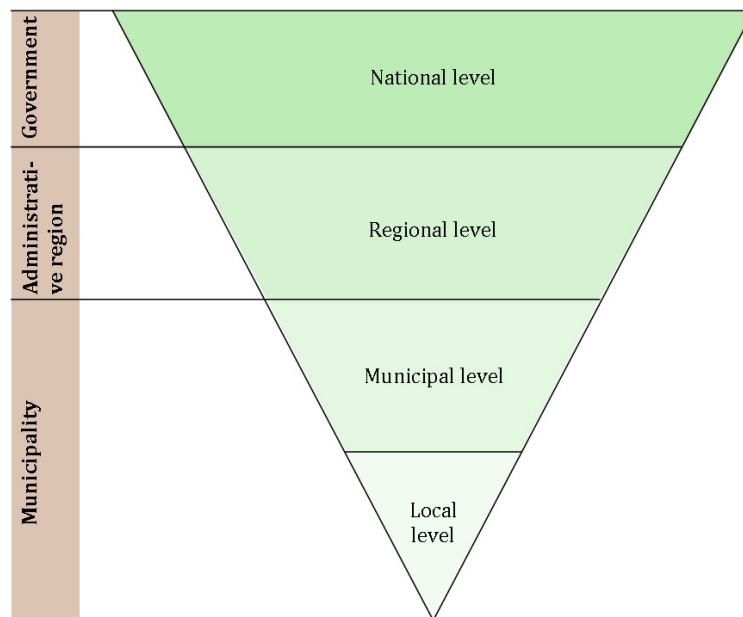


Figure 5: The Danish hierarchical planning system (own figure based on (COMMIN).)

In 2007 reform of the local government structure came into effect and 271 municipalities were transformed into 98 larger municipalities. This occurred alongside a replacement of the counties with regions. The reform meant national government responsibilities became decentralised. The responsibilities for comprehensive municipal planning are now divided between the central government and local government, leaving the regional government with summing up the regional development plans. Hence, the Planning Act set up a hierarchical, top-down system which means that the regional development plans have to comply with the national interest of the central government. Subsequently, the comprehensive MSP has to comply and be approved by the region and state (Sehested, 2009).

The following sub-sections will identify CCA responsibilities and tasks in the three levels presented in Figure 5 (COMMIN).

5.2.1 Central Government

The Ministry of Environment (MoE) is responsible for comprehensive spatial planning. The general responsibility of the MoE is to establish a comprehensive development framework for regional and municipal planning. This is done through national planning reports and directives based on governmental interests as well as dialogues. Regional and municipal planning has to comply with the MoE goals and interests. This also means that the MoE has veto rights and power to influence regional and municipal planning (COMMIN).

Climate Change Adaptation Planning and Commitments

CCA is integrated into the MoE, whereas, CC mitigation is both integrated into and institutionalised by the MCEB. This shows that CC from a national political perspective is institutionally considered to be two different tasks.

CCA became a national interest in 2008 as a result of, amongst other factors, the IPCC 4th Assessment Report (MCEB, 2008). The MCEB formulated a national adaptation strategy advocating sectors to react in a timely manner to impacts from the changing

climate. The strategy identifies potential vulnerable sectors and describes which responses could be attainable. These responses are expected to be scientifically, technically and socio-economically appropriate for implementation within the next 10 years (COMMIN; MCEB, 2008). The former government committed to initiate and undertake:

- www.KFT.au.dk: KFT is a co-ordination unit for research within CCA. Its main goal is to research how best to adapt within different sectors and to secure a coordination of existing and new knowledge between different research environments within CCA. Furthermore, it has to enhance and contribute to interdisciplinary knowledge exchange in national and European research programmes. Lastly, the unit has to contribute the research environments with data, scenarios, guidelines and workshops, and update MoE's website klimatilpasning.dk with the most recent knowledge available; and
- www.klimatilpasning.dk: a website about CCA which main goal is to provide information to the public, private businesses and local authorities. (MCEB, 2008)

The new government took office in 2011, and with the government programme they committed to bring more focus to CCA. In relation to this, the MoE has committed to the following developments:

- To establish a task force assisting municipalities to undertake planning, strategies and action plans to cope with CC along with ensuring implementation of EU Floods Directive;
- To prepare CCA action plans within two years;
- To review legislation regarding water courses and water supply; and
- To examine whether water utilities have adequate opportunities to finance CCA initiatives within sewers and sustainable urban drainage systems (SUDS). The point is to examine how to divide the responsibilities among water utilities, municipalities and other authorities. (Task Force on Climate Change Adaptation, 2012)

As a result of the government's commitments, the Climate Change Adaptation Task Force have to visit various municipalities on an informal basis and maintain websites. Furthermore, the government also regulated sewer utility companies to undertake flood maps in order for the municipalities to undertake their action plans (Task Force for [klimatilpasning](http://klimatilpasning.n.d.), n.d.). (MoE, 2012)(MoE, 2012)

Furthermore, the government has published a national action plan for CCA: "*How We Handle Cloudburst and Rainwater; Action Plan for Climate Protection of Denmark*". The action plan is a political document, listing initiatives already taken by the government as well as planned future actions. In terms of collaboration across sectors and local authorities, the report states that:

"Efficient climate change adaptation demands a coherent climate change adaptation effort. Therefore the government encourages collaboration and knowledge sharing. Open communication and appropriate examples play an important role. The government will lead the way with a series of

collaborative projects and encourage other parties to participate.” (Danish Government, 2012)

The initiatives already launched, as well as the planned initiatives, all concern collaboration across sectors such as the business community, building associations and local authorities. Collaboration between local authorities is, however, absent in the document. This may be grounded in the fact that the document is merely about what the government wishes to do. Furthermore, the government has published guidance aimed at the local authorities on how to undertake the CCAP, where it would be more relevant to consider horizontal collaboration (Danish Government, 2012).

5.2.2 Regional Government

The regions' main task is to steer the Danish health system and social development. In regards to spatial planning, the regions are responsible for planning strategies with respect to the national interest. The aim of the regional development strategy is to capture the overall development. Additionally, the regions also have the administrative task to prevent soil pollution and to secure the raw materials in the region (COMMIN; Danish Regions, n.d.).

Climate Change Adaptation Initiatives on a Regional Level

Since the region has little to do with actual spatial planning, the government have not set any tasks for them to complete. However, the region can assist the regional municipalities if needed. The NDR has taken a stance to CCA in their regional development strategy.

However, in the NDR Regional Development Plan, published in 2012, CCA is an included topic. Also, collaboration between local authorities is mentioned in the document, saying that the regional authority wishes to:

“Take initiative to collaboration about climate strategies. The challenges facing Northern Jutland concerning climate change adaptation, is solved best jointly, and there is therefore a need for a broad collaboration about climate strategies, including identification and mapping of areas of risk” (NDR, 2012 own translation)

In the regional development plan, there is an emphasis on horizontal collaboration between local authorities in relation to the examined subject initiated by the regional governmental.

However, in the Central Denmark Region (CDR) more initiatives have been taken. The NDR has, through partnerships with national and international partners, initiated workshops and conferences about how to do Climate in Practice where CCA is a subject to be handled. The aim of the Climate in Practice is, among others, to create a template for the municipalities to undertake CCAP. The template is available to all the Danish municipalities. In addition, the CDR is also a part of a European Union project, CLIWAT, which is a transnational project in the North Sea Region about groundwater (CDR, n.d.).

5.2.3 Municipalities

The municipalities have a great responsibility in spatial planning concerning town and countryside. During the first half of the local election period, each council has to adopt

a political strategy for municipal development, known as the municipal spatial plan (MSP). The adopted strategy then forms the framework for how to prepare local plans and process cases relevant to the municipality or cases related to other legislation. Local plans are prepared when needed and have to be approved by the municipal council before they become effective (COMMIN).

Municipal Climate Change Adaptation Planning and Actions

The government and the Local Government Denmark (LGDK)² negotiated the finances for 2013 for the municipalities, and as a result the municipalities have to undertake CCA action plans and strategies by 2013. These plans cover a mapping of the risks of flooding and intend to create an overview in order to prioritise actions (Task Force for klimatilpasning, n.d.).

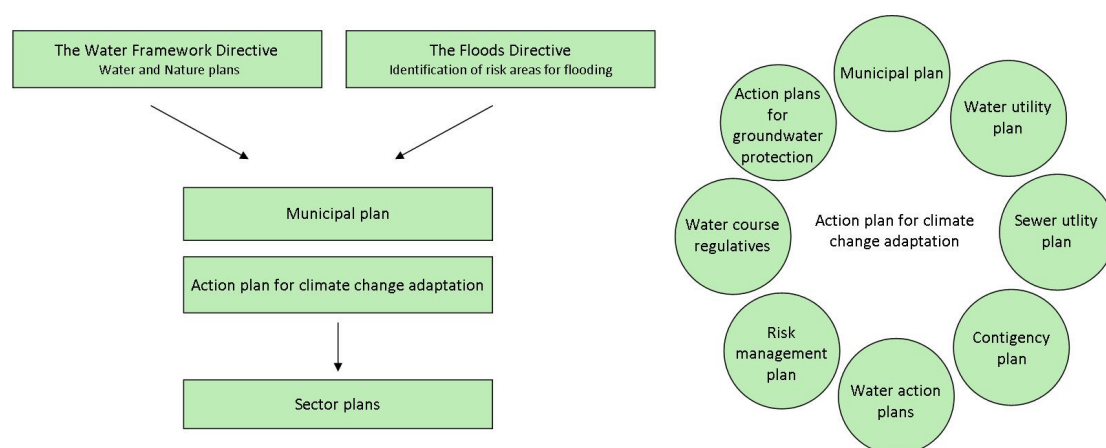


Figure 6: left: hierarchical structure of the action plan for CCA (klimatilpasning.dk 2013); right: the sectors that the action plan for CCA influences (klimatilpasning.dk, 2013)

The action plan for CCA is integrated into the comprehensive municipal planning and has to comply with The EU Water Framework Directive and The Floods Directive (Task Force for klimatilpasning, n.d.). The two directives are implemented into Danish legislation and are put into practice on a municipal level as River Basin Action Plans and contingency plans. In regards to the River basin action plans, CCA has not yet been integrated. Hence, the comprehensive municipal planning and the action plan for CCA influence the sector-plans for which the municipality are responsible (see Figure 6 left). Sectors influenced by the action plan for CCA are demonstrated in Figure 6:

In terms of the content of the CCA strategies and action plans, the government published a guide in early 2013 called *Climate Change Adaptation Plans and Climate Local Plans* to help the local authorities in their planning process. In the guidance, the different steps of the process and the local authorities' tasks are described. The process of plan making on a municipal level lies within the frames of the Planning Act regarding the debate and hearing process of authorities. As an inspiration, the Task Force for Climate Change Adaptation suggest the following process:

² LGDK is the interest group and member authority of Danish municipalities and it is voluntary to be a member of. Nevertheless, all 98 municipalities are members (LGDK, n.d.).

- Start-up: the initial phase consists of the first political and managerial discussion of expectations for the content, process, resources etc. ;
- Mapping: mapping consists of flood prone areas with consequences for the landowners and citizens;
- First public debate: could consist of parts of the plan strategy ahead of a comprehensive municipal development plan, or as an appendix to the comprehensive municipal development plan with a pre-debate;
- MSP proposition: the planning begins with a politically theme meeting where the work guidelines are agreed upon and the political content in the CCA plans are highlighted;
- Second public debate: a proposal for a CCA plan is put forward for debate as an appendix with an environmental assessment; and
- Final MSP: the politicians will evaluate the result of the debates and put forward the working guidelines with the final plan which will be adopted and made available to the public (Task Force for klimatilpasning, n.d.).

As such, the suggested process from the MoE of how to undertake the CCAP will set the analytical framework for analysis I, see chapter 7.

Furthermore, there is a suggestion to a possible organisation of the work, which is illustrated in Figure 7.

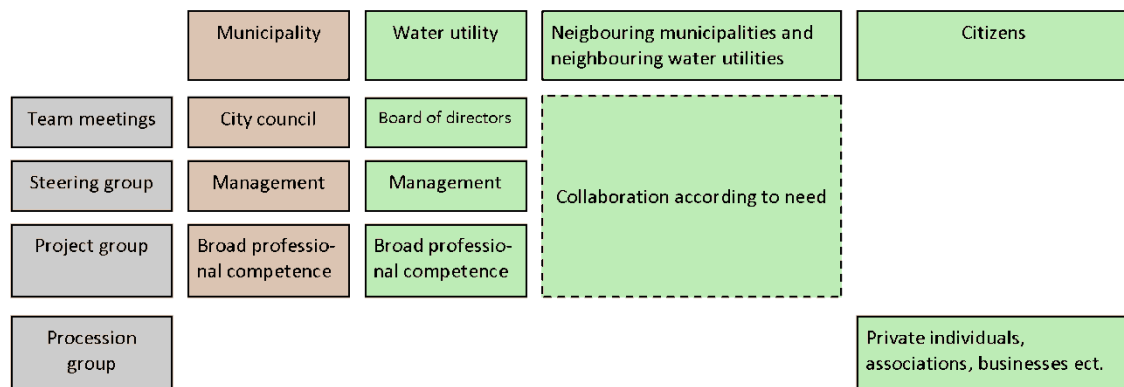


Figure 7: Possible organisation of the CCA plan process (Danish Government, 2013, p. 10)

The figure illustrates that there can be a lot of actors involved in the preparation of the plan, together within the local authorities; the water companies; and the neighbouring local authorities and water companies, as well as citizens. The advantage of having “*a broad political ownership*” (MoE & Danish Nature Agency, 2013) is emphasised in the guide, including the different actors along the process. Horizontal collaboration is also illustrated in Figure 7, and mentioned in the text, where the government states that there is a need for the local authorities to: “*assess the need for collaborating with neighbouring municipalities, if the municipalities for example share water catchment areas*” (MoE & Danish Nature Agency, 2013). Though collaboration is a focus point of the central government, the recommendation leaves it up to the individual local authorities to assess their need to collaborate with other local authorities concerning CCA.

5.2.4 Summary

Since 2008, CCA has been a subject of concern in Danish policies which has resulted in actions of identification of different affiliated sectors in Danish spatial planning. The way it has been executed is by creating an overall CCA strategy advocating that the impacts from the changing climate have to be dealt with. However, the government is still integrating CCA into physical planning, as it can be seen from the provided reviewed materials in this chapter. The government suggests horizontal collaboration in the *Climate Change Planning and Climate Local Plans* and so does the NDR's "*Regional Development Strategy*" which means that a horizontal municipal collaboration, to recognise common CCA barriers and opportunities when dealing with streams, is voluntary.

6 From Governing as Government to Governing as Governance: A Historical Review

This chapter will look at ways of governing in the public sector as CCA responses depend on, and are influenced by, governing systems at different levels. This will be done by taking a point of departure in Kooimans (2003) definitions of what governing means. However, before doing so, it is important to open up a discussion of what government and governance means and to what extent, it in reality, differs in a modern governing context. This will be done by looking at the historical development of governing systems in general and in relation to Danish planning.

Starting with the planning and governing traditions in Denmark, Sehested (2001) argues that the structure and organisation of the public sector in Denmark during the 60s and 70s match the idea of government. Government is a way of governing where a few people, positioned highest in the hierarchy of the public management system, are making the decisions. In relation to government, the knowledge on which decisions are made, are generated within the public organisation itself without including a wide range of actors. Furthermore, the public administration in a government structure is characterised by being a hierarchical organisation with *“hierarchical relations between superiors and lower-level staff and units, a clear work division and responsibility between different actors and offices, specialized work functions, work based on expert knowledge and formalized work processes and information preparation”*(Sehested, 2001). A hierarchical government can be identified throughout the public governing organ, both on the political and administrative levels. At the political level, the national government has sovereignty, providing the overall direction to all levels of the government structure. This means that there is not much room for external actor involvement in the decision-making process.

According to Sehested (2009), planning in Western European countries has, since the 1980's, abandoned the hierarchical and ruled-based planning systems to new forms of planning where there is faith in the planner's capacity to steer and to regulate the municipal developments. Furthermore, Healey (2006) argues that regulation, control and comprehensive plans have blocked the capacity of the city for dynamic urban development in many cases (Healey, 2006). Throughout the 1980's, and particularly in the 1990's, this view is argued to have led to the evolvement of a more flexible form of project planning, namely ad hoc projects. These projects evolve from the bottom and from outside of the planning bureaucracy. It involves citizens, interest groups, interest organisations and private interests paving a new way of working together i.e. public and private actors collectively find solutions to local problems (Sehested, 2009).

Involvement of actors in decision-making processes has led to the change of government structures from governing as government to what is popularly termed governance. Governance is, according to Rhodes, referred to as *“a new process of governing; or a changed condition of ordered rule; or a new method by which society is governed”* (Rhodes, 1996). As society has become more fragmented and differentiated, this has lead to greater complexity when making decisions and forming policies. Politicians have become more aware of the society's complexities. The political awareness has led to a need to gain a broader understanding of issues or developments from other actors outside of the public administration (Sørensen & Torfing, 2005). The political need comes from the complexity in society which has made it impossible to govern issues from the top of the hierarchy. Sørensen & Torfing (2005) also argue that there has been

a shift in the level to which citizens, civic associations and interest organisations are able to organise themselves. This shift is grounded in a general higher level of education in Western Europe than earlier. These actor and structural based changes in society have thus fostered the governing method of governance (Sørensen & Torfing, 2005).

Kooiman (2003) argues that governing issues generally are not just public or private but frequently shared. Governing activities between levels, i.e. local and state, are becoming diffused over various societal actors whose relationships with each other are constantly changing. The result of changing relationships has influenced traditional public governing activities and the role of government to become more of a facilitator and a co-operating partner (Kooiman, 2003). Therefore, he argues that it is more appropriate to speak about a shifting rather than a shrinking role of the state. A shifting role of the government does, however, not mean that the traditional government is rendering. On the contrary, it means the traditional government is reorganising tasks and attaining a greater awareness of the need to interact with other societal actors. The state is merely showing a growing awareness of the limitations of traditional governance on its own (Kooiman, 2003).

Using Kooiman's (2003) definition of governing and governance fosters a new discussion on which mechanisms in Danish governing organisation influences CCAP and governance on a municipal level. The definition of governing is in Kooiman's (2003) own words: *"the totality of interactions, in which public as well as private actors participate, aimed at solving societal problems or creating social opportunities; attending to the institutions as contexts for these governing interactions; and establishing a normative foundation for all those activities"* (Kooiman, 2003) and governance can then be considered as *"the totality of theoretical conceptions on governing"* (Kooiman, 2003).

According to Kooiman's (2003) definition, governance is defined by the totality of the theoretical conceptions on governing. This means that governance is the totality of the interactions. The interactions are to be considered as the arena in which public and private actors participate in to solve common societal problems or to create opportunities. The interactions are happening within an institutional context and are establishing a normative foundation for activities (Kooiman, 2003). To sum up, governance is dependent on the context of the governing system and the elements which institutionalise it.

It is important to look at the transmission of the "governing system" from government to governance, because organisations are built upon institutions. As Giddens (1984), in Scott (2001), argues, institutions are by definition the enduring features of social life giving solidity to social systems across time and space (Scott, 2001). To this Jepperson (1991) argues that *"Institutions exhibit distinctive properties: They are relatively resistant to change"* ((Jepperson, 1991) in (Scott, 2001)). Lastly, Zucker (1977) argues that institutions *"...(t)end to be transmitted across generations to be maintained and reproduced"* ((Zucker, 1977) in (Scott, 2001)). Scott (2001) explains that these properties of institutions are reasoned in the elements constituting institutions. The elements are the regulative, normative and cultural-cognitive pillars. They function as the building blocks of institutional structures, functioning as the elastic fibres resisting change (Scott, 2001) (see 6.2.1 for a further elaboration on the three institutional pillars).

Keeping in mind Kooiman's (2003) and Scott's (2001) research in governing and institutions and the planning related subject of the thesis, it is important to look at which kind of planning theories can be identified in governing systems. More specifically, it is important to understand what influences the decisions on the municipal level when CCA is being integrated as governance is the totality of the theoretical conceptions on governing. The following section will thus examine what conceptualises governance on a more analytical level, how decisions are being made and how it can affect CCAP on a local level.

6.1 Governance

This section deals with the concept of governance by firstly giving a broad definition of what governance is considered to be. This is done by a review of Rhodes' (1996) article *The New Governance: Governing without Government*. Secondly, by giving a more case specific definition of what governance is on a municipal government level. This is done in order to understand the mechanisms in networks and what networks are triggered by. Lastly, a summary will be given and the concepts found will be put in relation to the Danish planning context and research concerned with Scandinavian CCA governance.

The term governance is widely used in theoretical discussions to describe new ways of steering, but has distinctive meanings (Rhodes, 1996; K. Sehested, 2002). To gain an overview of the nature of governance, Rhodes' (1996) article *The New Governance: Governing without Governance* will be applied in the following section, as it gives a broad understanding of governance by identifying six separate uses of governance. These are, as Table 4 suggests, the minimal state, corporate governance, the new public management, "good governance", socio-cybernetic system and the self-organising networks.

Table 4: Different governance types (Rhodes, 1996)

Governance type	Characteristics of governance
Minimal State	Governance by: - privatisation (public intervention through regulating rather than ownership) - cuts in civil service
Corporative Governance	Inspired by private sector management: - overall direction of organisation - Builds on openness, integrity and accountability on actions
New Public Management	Governance by introducing new institutional economy through: - introducing incentive structures such as market competition into public service provision - disaggregating bureaucracies - contracting-out Policy decisions rather than service delivery
Good Governance	Governance through: - distribution of internal and external political and economic power - the state has legitimacy and authority achieved through democracy - efficient, accountable and open public service designing and implementing appropriate policies
Socio-Cybernetic System	Governance through the involvement of multiple actors, characterised by: - blurry boundaries between sectors - an interdependence among the actors - shared goals among the actors - interactive social-political governing through negotiation in networks
Self-Organising Networks	Governance through networks created of organisations with a need to exchange resources. The network needs: - reputation, trust, reciprocity and mutual interdependence The networks resist government steering, develop own policies and form their environments

The table shows that in the *minimal state* governance is considered to be through privatisation and it prefers to regulate instead of having ownership. *Corporative governance* also argues for less government and more governance with accountability for actions. It directs rather than to run the business; it oversees and controls management actions by introducing accountability. Corporative governance builds on openness, integrity and accountability. Accountability is featured in private sector management where accountability for actions is central. *New public management* also argues for less government, as in less service delivery, but more governance, as in policy decisions. New public management sees steering and governance as being synonyms. It introduces incentive structures as market competition into public service provision. Accountability is also central in this governance type. 'Good governance' is mainly introduced in 3rd world countries and the central idea of governance is that 'good governance' marries the new public management to the advocacy of liberal democracy. *Socio-cybernetic system* circles around the idea of governance being the result of interactive social-political forms of governing. Decisions are made in networks with multiple interdependent actors, with blurry boundaries and shared goals. The networks are self-regulating and co-regulating. This form of governance differentiates the political system resulting in that the central government is no longer supreme. Order in socio-cybernetic system governance is present in the form of negotiations. In *self-organising networks*, governance is about managing networks. It highlights reputation, trust, reciprocity and mutual interdependency. Networks are an alternative to and not a hybrid of markets and hierarchies; they span the boundaries of the public, private and voluntary sectors. This form of governance suggests that networks are self-organising.

In this context, self-organising means that the network is autonomous and self-governing (Rhodes, 1996; Rhodes, 1997).

Looking at these views of governance, one could argue that governance has many meanings and therefore it becomes complicated to use. Rhodes (1996) suggests that by stipulating one meaning governance can be rescued. Governance refers to self-organising, inter-organisational networks. He looks at governance as a combination of the minimal state, as a socio-cybernetic system and as a self-organising network. Rhodes (1996) characterises governance to be:

- 1) *Interdependency between organisations. Governance is broader than government, covering non state-actors. Changing the boundaries of the state meant the boundaries between public, private and voluntary sectors became shifting and opaque.*
- 2) *Continuing interactions between networks members, caused by the need to exchange resources and negotiate shared purposes.*
- 3) *Game-like interactions, rooted in trust and regulated by rules of the game negotiated and agreed by network participants.*
- 4) *A significant degree of autonomy from state. Networks are not accountable to the state; they are self-organising. Although the state does not occupy a privileged, sovereign position, it can indirectly and imperfectly steer networks.* (Rhodes, 1996)

While Kooiman (2003) gives a more broad definition of governance, Rhodes (1996) gives a more conceptualised definition of the term. He argues governance depends on networks to be independent, to some extent self-governing and not accountable to the state. Actors in a network share the idea of negotiating shared purposes and exchange of resources. The network is built on trust and regulated by rules agreed on by the participants. In order to establish a more detailed definition of governance in relation to network, the next sub-sections will look at network governance in relation to network steering.

6.1.1 Network Governance

According to Sehested (2009) and Rhodes (1997), project planning is described to be a part of a certain regulatory situation in public administration, generally referred to as network governance. The central principals of governance in network governance are interdependency, negotiation and trust, which are the same as what (Rhodes, 1996; Rhodes, 1997) defines governance to be. The scale of policy networks is by Rhodes (1996;1997) explained to range from open and integrating networks with a plurality of participants, to closed and elitist governance networks with few participants. In relation to urban planning, this subject seems to become increasingly situated where interactive forms of governance forms supplement or at times undermine traditional government institutions and representative democracy. The traditional top-down comprehensive urban planning, based on subordination, control and detailed regulation is becoming increasingly difficult to achieve (K. Sehested, 2009).

6.1.2 Network Steering

In previous section, a description of government and governance was given because it very much relates to Western European countries and, in particular, Denmark. To sum up, the Danish governing style is mainly characterised as a government system relying on expert knowledge and not leaving much room for involvement from outside the public organisations in urban development. To gain an understanding of how CCA is

being undertaken in Danish municipalities, the following will provide an understanding of the different forms of network steering.

On one hand, network steering is a certain form of steering and, on the other hand, a certain form of network. First of all, the term refers to establishing networks and involving participants. Secondly, many forms of network that has nothing to do with steering exist. Network steering can be defined as:

1. *A relatively stable horizontal connection of interdependent, however, operationally autonomous actors;*
 2. *Actors interacting and trying to influence each other through negotiations;*
 3. *Places within an institutionalised community;*
 4. *Self-regulating within the given framework usually formalised by political authorities; and;*
 5. *In a wide range contributing to public steering*
- (Sørensen & Torfing, 2005)

Firstly, steering networks are formed through coalitions of relevant and effected partners who, on the one hand, are unilateral dependent of each other's knowledge, authority and resources to cope with a given steering assignment. On the other hand, these partners act independent of each other, meaning that they are not committed to fulfil instructions but only on trust and mutual commitment.

A steering network offers all partners something they can use even if there is an inequality in allocation and authority. The partners can be asymmetric, meaning that some of the participants are more influential than others. Conclusively, the centre core in steering network is that there is no chain of command and thus, no possibility to steer by commanding. Participating in a steering network is voluntarily, which means that it is up to the participants to leave if unsatisfied with the network's form of function (Sørensen & Torfing, 2005).

Secondly, the participants interact and influence each other through negotiations. This could be both negotiations based on interest, where all partners give and take, or it could be consensus seeking discussions to construct a common ground and common goals through negotiations. These negotiations are exercised by either direct or indirect power use and rarely lead to agreements between the participating actors. Most commonly, agreements are reached through what is known as a rough consensus, leading to frustration which is not commonly considered as acceptable (Sørensen & Torfing, 2005).

Thirdly, the negotiations more or less take place within a framework of institutionalised communities. Sørensen & Torfing (2005) explain that the steering network is the sum of the individual parts, but does not mean that it is a homogenous and complete integrated unit. The institutional framework for the network interaction has regulatory, normative and cognitive and imaginary aspects.

- Regulatory aspects seeks to establish more or less firm rules, roles and procedures
- Normative aspects seeks to establish norms, values and normalised standards
- Cognitive aspects seeks to develop different forms of codes, concepts and knowledge

- Imaginary aspects seeks to create certain identifications points, visions and stories

The normative and regulatory aspects help to establish the interactional rules for negotiations in networks, while the cognitive and imaginary helps to connect the actors in networks and to give them a common identity (Sørensen & Torfing, 2005).

Fourthly, the institutionalised network interaction is self-regulating. This means that decisions and interactional rules are subject to on-going negotiations between the actors in the network. Thus, the steering network is not subject to hierarchical order of command structure and is not steered by economical market powers. This means that if the steering network is submitted to hierarchical order of command or steered by economical competition, principals will undermine steering networks. Forcing the network to do so will ruin the unilateral trust. Furthermore, self-regulation is not indefinite because steering networks operate in political and economic surroundings that both facilitates and limits the ability of the network to self-regulate (Sørensen & Torfing, 2005).

Fifthly, it is crucial for steering networks to involve themselves in productions of public steering in a wide range. This means that the networks help in developing and interpreting: issues; challenges; values; visions; institutions; and concrete initiatives recognised as being public and not meant narrowly as in a question of formulating and implementing laws and regulations. Hence, networks that do not, in this relation, contribute to the public steering cannot be considered as steering networks (Sørensen & Torfing, 2005).

Through the section concerning governance and networks, it has become clear that institutions play a major role in the actors' and organisations' ability to act. The following section will therefore look into institutions.

6.2 Institutions

Kooiman (2003) argues that governing is embedded in institutional settings. Therefore, this section will look at how institutional settings enable or constrain governing. In relation to this thesis, this is an interesting question, as the governing of CCA is equally embedded in institutions of the local authorities as well as the involved private sectors. If CCA were to be co-ordinated between the municipalities, the institutional settings can determine the possibilities and limitations for this. To examine this issue, the following section will examine institutions, what the characteristics are and what form and support institutions.

Scott (2001) lists several ideas constituting a "*dense conception*" (Scott, 2001) of institutions, which will be presented and elaborated in the following paragraphs to provide an understanding of characteristics of institutions.

Two of these ideas contributing to the constituting dense conception, concern stability and institutions being rigid to change: as institutions are social structures created and developed over a long period of time, they have a high degree of resilience to change. In relation to the thesis, this is an important issue, as it examines which parameters in the institution created around CCA should change in order to enhance horizontal collaboration. Though rigid to change, this does not mean that institutions do not

change, as they are dependent on human behaviour: change in rules, norms, and meaning amongst actors or organisations. The changes can thus both appear incremental and discontinuous (Scott, 2001).

Furthermore, institutions “*are transmitted by various types of carriers, including symbolic systems, relational systems, routines and artefacts.*” (Scott, 2001). The symbolic systems can be used to pass on information concerning e.g. rules or which values to aim for within an organisation, while the relational system is concerned with how individual actors or organisations interact, for example, through government systems or individual identities. Furthermore, routines can carry institutions by individuals obeying their duties or following a protocol or script. Finally, artefacts helping individual or organisations to perform their tasks can help borne an institution. (Scott, 2001)

6.2.1 The Three Pillars of Institutions

Scott (2001) introduces the idea that institutions are created or supported by three elements. He argues that “*Regulative systems, normative systems, cultural-cognitive systems – each of these elements has been identified by one or another social theorist as a vital ingredient of institutions*” (Scott, 2001). These three elements constitute what he refers to as *The Three Pillars of Institutions*, and are the building blocks of institutional structures. Scott argues that these create stability and rigidity to change and thereby maintain or change institutions.

The characteristics of the three pillars are illustrated in Table 5 and will be elaborated in the following paragraphs.

Table 5: The three pillars of institutions (Scott, 2001)

	Regulative	Normative	Cultural-Cognitive
Basis of compliance	Expedience	Social obligation	Taken-for-grantedness, shared understanding
Basis of order	Regulative rules	Binding expectations	Constitutive schema
Mechanisms	Coercive	Normative	Mimetic
Logic	Instrumentality	Appropriateness	Orthodoxy
Indicators	Rules, laws, sanctions	Certification, accreditation	Common beliefs, shared logics of action
Basis of legitimacy	Legally sanctioned	Morally governed	Comprehensible, recognisable, culturally supported

The Regulative Pillar

The regulative pillar concerns laws and rules: what must we do? The rules force the actors to act in certain ways or go through certain procedures, enabling or limiting types of behaviour or actions. These rules can be both formal laws and informal. The characteristics that will occur if the rules are not followed are legal sanctions or shame for the actors involved.

In creating the regulative pillar, coercive mechanisms to support the institution are thus used. These are often set up by the use of authority “*in which coercive power is legitimated by a normative framework that both supports and constrains the exercise of power*” (Scott, 2001). In the case of CCA in the public sector, this could be a national authority creating rules and guidelines for the local authorities, as the public sector are divided in a hierarchy,

based on a normative framework. Here, the state takes the role of the “*rule maker, referee and enforcer*” (Scott, 2001, p. 54). Furthermore, powerful actors can also use direct sanctions on others, and hereby impose their will. Finally, a third method, the use of inducements in the shape of e.g. subsidies or funding, can be used, making it attractive for the actors to comply with the rules. In the analysis of the interviews undertaken in relation to the thesis, answers (about, for example, barriers to horizontal collaboration or answers about the local authorities’ motivation to undertake CCAP) including a law, legislation and/ or regulation are therefore considered to be coherent to the regulative pillar.

The Normative Pillar

In addition to the regulative pillar, Scott (2001) argues that institutions are also supported by a normative pillar: what should we do? The pillar includes both values and norms, concerned with what is desirable and how this should be achieved in the “right way”, respectively. Therefore, “*normative systems define goals or objectives (e.g. winning the game, making a profit) but also designate appropriate ways to pursue them (e.g. rules specifying how the game is to be played, conceptions of fair business practices).*” (Scott, 2001) In terms of the public sector examined in this thesis, the normative pillar will then influence an issue depending on the actors’ values and norms: what they consider to be an appropriate goal and how it ought to be reached. The norms and values one should follow can however be dependent of the role of an actor, while some norms and values will apply to all involved actors. The roles of an actor can be developed formally (e.g. a defined role in an organisation) or evolve informally over time (e.g. where differentiated expectations to different actors develop to guide their different behaviours). The normative pillar thus rests on what is appropriate for an actor to do in a given situation, because of binding expectations from the actor’s surrounding environment. In regards to the normative pillar, an answer in the interviews undertaken stating that priorities have been made differently resulting in deprioritising CCAP, is considered to be a normative barrier to horizontal collaboration between sectors and other municipalities. Normative motivations will, in this case, be if they consider that there is a need to collaborate or a need to create common standards.

The Cultural-Cognitive Pillar

The cultural-cognitive pillar concerns routines: what are we usually doing? Indicating institutions are shaped and maintained by a taken-for-grantedness among the actors involved. Over time, actors develop a shared understanding by interacting with each other in what to aim for and which processes to undertake through the routines they usually go through. A sub-culture can thus develop internally in a given organisation. However, a culture can also develop outside the organisation in “*wider institutional frameworks that provide prefabricated organising models and scripts*” (Scott, 2001). These frameworks can either be adopted by the organisations or the individual actors within the organisation, or simply be imposed on them. Using the example of the public sector, individual municipalities may have different work cultures or processes concerning an issue, until guidance are given from the central government on how to perceive and work with the specific issue. Thereby, the work processes may change in the municipalities, adopting the culture of the central government. In regards to the cultural-cognitive pillar, answers given in interviews which include indications of not understanding CCA will, in this case, be considered as being a cultural barrier because it indicates that a culture has not yet been established.

After this review on governance, networks and institutions, the following section will elaborate the theoretical basis by putting it within a Danish context.

6.3 Climate Change Adaptation Governance in a Danish Planning Perspective

The political and administrative decentralisation of state and region has, in a Danish context, meant that tasks have been transferred to municipalities and to their local institutions and boards (K. Sehested, 2009). By decentralising tasks and competences from central and regional governments, planning in municipalities has seen lesser restrictions from the region and the state. The decentralising of tasks has also fostered a variety of actors and networks in the municipal governance to become mobilised. Wejs (2013) however argues that coordination across sectors prove to be more difficult than it is within the sectors. This can be referred to as *professional sector silos*. The sector silos exist, because different institutional (i.e. norms, cultures and procedures) rules emerge within the different departments. These institutional rules can complicate the collaboration across sectors (Wejs, 2013).

Before the municipal reform in 2007, tasks were divided between the state, region and municipality and were very much in a strong hierarchical order. Meaning, the municipalities' plans became more of a routine, and most urban development projects were a result of various other reasons than the aim of the Planning Act. Initiations of urban development projects were mainly due to investors and developers and other state programmes concerned with urban development such as urban renewal or environmental concerns (K. Sehested, 2009). In the end it meant that the projects changed the plans and not vice versa, this resulted in deregulation, self-regulation and market principals becoming central in Danish municipal planning.

The Danish parliament is characterised as a representative democracy. The politicians are guided by the work of officials in different departments (Healey, 2006). In rational planning, politicians are guided by expert knowledge and in collaborative and communicative planning by consensus or agreements of knowledge. These definitions of how knowledge is gained in rational planning and collaborative planning are very broad but none-the-less important in a Danish planning context.

In rational planning theory, planning can be characterised as "*the rational mastery of the irrational*" (Healey, 2006) as planning is undertaken on the basis of rational assessments of different consequences. While goals set from the top of the hierarchy may be irrational as they are based on the values and aims at the political level. This emphasises expert knowledge and requires a clear division of tasks and responsibilities managed from a central authority from state level. The best result, according to rational planning, is achieved when the decision maker selects which alternative is more valuable, according all possible alternatives and consequences of a new initiative. In relation to the government approach to steering, this illustrates the clear division between the politicians and the public administration, as it is solely up to the decision makers to set out the goals and make the final decisions based on information provided by the municipal administration.

The rational approach towards planning has some advantages and disadvantages respectively in terms of professionalism and inclusion of scientific knowledge. The inclusion of scientific knowledge is good for the long-term because "*a key source of the*

planner's power to exert such influence is the control of information" (Forester, 1989). Forester (1989) argues that information is a source of power in the planning process and it makes the plans more reliable. The disadvantages come from that sector specialisation tends to make interdisciplinary collaboration difficult because each sector will develop a unique 'language' and culture that many times will be difficult to escape from. In terms of the clear work division in the administration, Weber (1968) in DiMaggio & Powell (1983) explains how the different departments in an organisational government are captured by the *iron cage*, as each department contains foremost the same professions within the governmental organisation (DiMaggio & Powell, 1983). Lund et al. (2012) explain that the iron cage logic, which is a part of the professional bureaucracy, in many cases may explain the way in which Danish municipalities approach CCA and cause barriers to improve CC plans and strategies. Lund et al. (2012) argue that the lack of collaboration in the creation of plans dealing with complex issues of society, such as CC, can make the plans insufficient to deal with these issues. However, Lund et al. (2012) find it striking that limited integration of CCA occurs in agricultural, traffic and health plans. This lack of integration is to be viewed in relation to the impacts of CC and will have consequences for all sectors (Lund et al., 2012). Adger et al. (2005), Urwin and Jordan, (2008) and Biesbroek (2010) also argue that adapting to a changing climate is a major challenge at all relevant administrative, temporal and spatial scales. Bottom-up approaches are likely to be more appropriately reasoned in the multitude of variables, context dependencies and cultural settings (N. W. Adger, Arnell, & Tompkins, 2005; G. R. Biesbroek, 2010; Urwin & Jordan, 2008). Due to this cross-sector complexity of CCA, there is a demand for involvement of a variety of public and private actors in the problem-solving debate (G. R. Biesbroek, 2010). Adger et al. (2005) explain that individual adaptation action does not happen on its own, because actions are constrained by the institutional processes, such as regulatory structures, property rights and social norms, associated. One reason related to the institutional constraints of CCA is due to the scale of international agreements. UNFCCC, for example, encourages nations to adapt, though most adaptation is associated to lower elements of jurisdiction since the impacts of CC occurs locally. Adger et al. (2005) classifies these jurisdictions as the municipalities, cities, firms and markets, which are to adapt within the available technologies, regulatory systems, knowledge of future climate risks and institutions (N. W. Adger et al., 2005; Wejs, 2013).

Sehested (2009) argues that Denmark have had a long tradition of interaction between public and private actors in government matters as well as a long history in democratising public institutions and planning. Furthermore, she also argues that the Danish Planning Act, since the 1970's, regulated participation as a mandatory part of the process of making comprehensive municipal spatial plans. The participation is conducted as an eight week hearing process where the public authority invite the public to give a statement if they in any way are affected by the new plans, through newspapers or other media. This means that the formalised plans by professionals are almost done, leaving little room for amendments. On one hand, it could be argued that plans based on expert knowledge still side with the interest of professionals and thereby give the professionals influence over the plans. This also emphasises what Pløger (2001) argues, other actors than the professional can have difficulties getting access and influence. On the other hand, one could argue that the inclusion of a broad range of stakeholders is vastly promoted in policy responses to CC. However, many authors have looked at this uncritically. Few et al. (2007) explain that there has been an

increasing recognition that participatory processes are inherently problematic in relation to environmental policies (FEW, BROWN, & TOMPKINS, 2007). Sehested (2009) adds to this discussion that in the Danish political decision making system, major interest organisations have gained special access by becoming directly integrated into the process, while other actors have had great difficulty to gain access (K. Sehested, 2009). Furthermore, she adds to this discussion, that institutionalising participation into the Danish corporative political system has given professional actors a major influence on planning and sustained elitist network governance. Finally, in regards to the Danish Planning Act today, it has developed to encourage municipalities to pursue a broad and pluralistic involvement though it is still not mandatory (Sehested, 2009).

6.4 Summary of the Theoretical Chapters

The theoretical chapter captures the relevant characterisations of a governmental organisation: how it is governed depending on the organisational settings; how these organisational settings are constrained by institutional mechanisms; and how network steering can be used to create interactions between sectors in order to make horizontal collaboration possible between municipal sectors and between municipalities.

Through the theoretical chapter, a historical review of the change from governing as government to governing as governance was put forward to provide an understanding of how governing has developed since the 1960s. Here it was found, that there has been a change in governing from being based on expert knowledge to being based on the inputs of several actors, included in the governing process. In relation to the thesis, the state of the art review on CCA showed that CCA governance literature calls for horizontal collaboration across sectors and municipalities. Therefore, a characterisation of governance, network governance and thus network steering was given mainly based on Sehested (2009) and Rhodes (1996 and 1997).

These parts showed that networks play a great part in governance and share some of the same characteristics. When comparing Rhodes (1996) and Sørensen & Tofting's (2005) definitions of governance and network steering, there are many similarities: interdependence and interaction between actors, self-regulating, but working within an institutional frame.

It is exactly the connection between the institutional frame and network steering which will be the main focus of the subsequent analysis in the thesis. In the theory chapter institutions were defined as the enduring features of social life giving solidity to social systems across time and space. Organisations are in addition to this constrained to a certain behaviour that derives from the institutional settings of an organisation (Giddens (1984) in Scott (2001)). The aim of the characterisation was to understand which institutional mechanisms could constrain or drive network steering as a tool to undertake CCAP in a governmental setting influenced by rational and collaborative rationales. In relation to this, Sager, in his article *"Planners' Role: Torn between Dialogical Ideals and Neo-liberal realities"* from 2009, argues that Nordic planners are inclined to be in favour of public involvement and open processes and opposed to manipulation and lenient control of developers (Sager, 2009). Additionally, the attitudes of typical Nordic planners, in particular, are much closer to communicative and collaborative planning theory than to *new public management*. This enhances the potential for horizontal collaboration with other local authorities in terms of CCA. However, the planners representing a sector are captured by the bureaucracy's iron cage to fulfil tasks set by

the organisations' political visions and strategies. These organisations are driven by bureaucracy and constrained by the institutions i.e. the regulative, normative and cultural-cognitive pillars/mechanisms identified in the theory chapter. The regulative pillar is concerned with what the organisations need to do, the cultural-cognitive is about what the organisations usually do, and finally the normative is concerned with what the organisations ought to do. The preferred collaborative approach to planning among Scandinavian planners thus show that they have a normative idea of collaboration being something to strive for in planning, but are however constrained by the cultural-cognitive and regulative pillar in their work lives.

The theoretical chapter, as well as the state of the art review on climate adaptation, will act as the foundation for the analysis in the next part of the thesis. The way they are applied will be elaborated through an analytical framework in the beginning of the analysis.

PART FOUR

ANALYSIS

This fourth part of the thesis presents the analysis of the chosen case studies. Part Four contains: Chapter 7: *Analytical Framework*; Chapter 8: *Part I of the Analysis: Status*; and Chapter 9: *Part II of the Analysis: Institutional Mechanisms*. The purpose of this part is to analyse the findings of the empirical data gathered through case study interviews. In order to do this, the part starts by setting up an analytical framework based on the Part Three and the state of the art review from Part One. The analysis itself will be divided in two parts: one concerning the current status of horizontal collaboration and one identifying the institutional barriers to horizontal collaboration.

7 Analytical Framework

According to Friedmann & Hudson (1974) Planning in practice does not look like planning in theory and therefore the analytical framework put forward is a tool that seeks to interpret and to understand the collected empirical data (Friedmann & Hudson, 2007). Thus, the analytical framework seeks to answer the following questions:

1. Which networks have been established in relation to municipal CCAP and how far are they in the CCA process?
2. Which institutional mechanisms are constraining and driving municipalities' attempts to undertake CCAP?

The first part of the analysis seeks to answer question 1 and thereby to uncover how far the interviewed municipalities respectively A, B, C, D, E and F are in the process to undertake CCAP. This will be done by using the process of CCAP as seen in chapter 5.2. Additionally, the first part of the analysis also seeks to understand if the interviewed municipalities are collaborating with other municipal sectors i.e. sewer water utilities and other municipalities to undertake CCAP. This is significant as horizontal collaboration to undertake CCAP on a municipal level by the Danish government is optional, however still recommended in CCA literature.

Question 1 will be answered by reviewing the responses of each municipality. The responses will be categorised in accordance to the Climate Change Adaptation Task Force Team's process of integrating CCA into the MSP. In Table 6 examples of categorisation are given according to the process of integration of CCA into municipal planning.

Table 6: Examples of answers from the interviewees categorised according to the Climate Change Adaptation Task Force Team's process schedule

Phase	Quote
Start up:	<i>"... and so I have made an agenda item for political deliberation and it means that in April, we will take it [Climate Change Adaptation Planning] for political deliberation, and then we will have it written down in our deliberation about how we want to approach it" (Municipality F, 2013; own translation)</i>
Mapping phase:	<i>"...So the project, we are in the [middle] of. It is aimed at identifying the mapping that the sewer utility companies have to do for the municipalities. We have given them [sewer utility company] the task and that is where we are now" (Municipality E, 2013, own Translation)</i>
Final MSP:	<i>"We are in the implementation phase" (Municipality A, 2013, own Translation)</i>

Question 1 also calls for a status of the existing collaboration that the different municipalities are engaging in. Table 7 shows the different interviewed municipalities in the left column. The top row indicates the possible actors that are advocated in CCA theory. The sewer utility company is part of the municipal organisation; however in

2007 as a part of the reform it became privatised and operates under different legal frames to the municipality. Within the 'Other Sectors' category are sectors within the municipal organisation. Lastly, the 'Other Municipalities' category contains the interviewed municipalities and/or other municipalities within the NDR or the neighbouring CDR. If the municipalities are in a form of collaboration with the sewer utility companies, other sectors and other municipalities it will be indicated with a yes, and if not, with a no. Public participation is not featured in this case as it is an integral part the Danish planning process.

Table 7: Internal and external collaboration partners

Municipality	Sewer Utility Companies	Other Sectors	Other Municipalities
A			
B			
C			
D			
E			
F			

Thereby the first part of the analysis serves as introductory to the analysis' second part by providing a status quo of the NDR's municipalities' process and collaboration related to CCA.

The second part of the analysis seeks to answer the second question. The second question calls for an understanding of the institutional mechanisms that constrain or drive horizontal sector collaboration and horizontal municipal collaboration. In regards to the regulative pillar, an answer including a law, legislation or regulation is considered to be a regulative barrier and if the motivational answer includes a law, legislation or regulation as a reason for initiating CCA it is considered to be a regulative motivation. In regards to the normative pillar, an answer of prioritising differently and allocating efforts to other topics, projects or tasks, resulting in down prioritising CCAP, will in this context be considered a normative barrier to horizontal collaboration between sectors and other municipalities. Normative motivations will in this case be if they consider that there, first of all, is a need to collaborate or a need to create common standards. In regards to the cultural-cognitive pillar answers including indications of not understanding CCA, this will be considered as a cultural barrier.

8 Part I of the Analysis: Status

Firstly, as an introductory analysis, this chapter will provide a status of how far the municipalities are in undertaking CCAP. Secondly, this part of the analysis examines if the responsible sector of the municipalities are collaborating with other municipal sectors and other municipalities when planning for CCA responses.

8.1 Status of Climate Change Adaptation Planning

The process of undertaking CCAP is divided into six phases: start-up; mapping; first public debate; MSP proposition; second public debate; and final MSP (as seen in the context chapter 5.2).

Table 8: Status quo of CCAP own table)

Municipality	A	B	C	D	E	F
Start-up						X
Mapping		X	X	X	X	
First public debate						
MSP proposition						
Second public debate						
Final MSP	X					

Table 8 indicates that one out of six municipalities is still in the start-up phase of planning for CCA. Four out of six municipalities are at the mapping phase and one out of six municipalities is at the implementation phase. In relation to this, it is important to notice, that Municipality A's CCA plan was prepared in 2008, i.e. before the regulations imposing municipalities to include CCA in the MSP was passed. This means that the plan prepared by Municipality A is not yet a part of the MSP. However, in relation to the thesis, the X is placed in the final phase of the process, as Municipality A is considered to be in the implementation phase of the planning process in their version of the CCA plan, regardless of it is integrated in the MSP or not.

What is significant about these findings is that the municipalities can be divided into two categories. The first group consists of municipalities: B, C, D, E and F who initiated the planning process later than 2012, regardless of knowing that the government, since 2011, negotiated the finances with Local LGDK for municipalities to undertake CCAP by the end of 2013. The second group, consisting only of Municipality A, initiated the process before 2012 (in 2008). This municipality is categorised as an *urban municipality* whereas the municipalities of group 1 are categorised by both *outer* and *rural municipalities* in the government's rural district report (see section 5.1). In CCA literature, urban areas are projected to be more vulnerable towards the impacts. This is founded in a simple technical matter of having more impermeable vertical and horizontal surfaces. An additional reason is that the urban areas have more resources at their disposal.

The intention of

Table 9 is to map down which of the municipalities are collaborating with other sectors and municipalities at the time of the interviews.

Table 9: internal and external collaboration partners

Municipality	Sewer utility companies	Other sectors	Other municipalities
MA	Yes	Yes	No
MB	Yes	No	No
MC	Yes	No	No
MD	Yes	No	No
ME	Yes	No	No
MF	Yes	No	No

8.1.1 Collaboration between Municipality and Utility

Table 9 shows that all municipalities mention the sewer utility companies as a collaborator in developing the CCA plans. However, the way in which they see collaboration in relation to CCA differs and will be elaborated below.

In Municipality B, D, E and F there is a culture to collaborate with the sewer utility company. The municipal official from Municipality D explains that there is a culture in collaborating with the sewer utility company on different tasks making collaboration with the sewer utility company when undertaking CCAP natural:

“Because the [sewer] utility is a natural part of my day in connection with the sewer-water-plan, the outlets and activities they have ... If they try new stuff out then it is my team who sits with it. So I almost have more collaboration with “City Name”[sewer] utility than I have with my own colleagues sometimes. So it is not something new because we sit in team Water and Soil.” (Municipality D, 2013, own translation)

It appears to be clear that collaborating with the sewer utility company comes from the fact that there is a culture within Municipality D to do so, and not because of a necessity to collaborate. The collaboration with the sewer utility company can thus be seen as a cultural-cognitive motivation as the mechanisms within this pillar includes behaviour derived from actions of what is usually done and thus a taken-for-grantedness among the actors involved.

In addition to this, the municipal officials from Municipality B and D further explain that within the municipal administration it is more common for the environmental department to collaborate with the sewer water utility company than it is for the planning department to do so:

“Had I been situated in the planning department, then it would have been more new to me. So no, it has been a natural intake to it [collaboration]” (Municipality D, 2013, own translation)

As it is more natural for the environmental department to work with the sewer utility company due to their intertwining tasks, a culture has been built up. However, as the planning department and the environmental department are administratively placed within the same administration, it can be argued that the given departmental frames function as an *iron cage* for each department. Each department has a certain culture and, according to the quote, cross-sectorial collaboration to undertake CCAP is derived more from the department’s mimetic process rather than the department’s normative process.

In the case of Municipality C, there are multiple employees who work part-time at the sewer utility and part-time at the municipality (Municipality C & Utility C). Therefore the municipality and the sewer utility are both a part of the process to undertake CCAP. According to the representatives from the municipality:

“The municipality and the sewer utility company work a lot together because we are situated in the same building, so, they [municipality] sit here and the director for the sewer utility company is also the head of the Technical- and Utility Department in the municipality ... it has been the intention from the beginning that it should be a unit ... we have decided

that, both politically and management wise” (Municipality & Utility C, 2013, own translation)

It is clear from the quote that the collaboration between Municipality C and the sewer utility company is built upon a normative conception to work as a unit. In this case, the representative expresses that the intention from the beginning has been that they should work together. According to Scott, the *normative pillar* includes *norms* and *values* that are concerned with how things are *archived in the right way*. In addition to this, the normative system strives to define *goals and objectives*, cf. Scott’s three pillars of institutions, sub-section 6.2.1. In this case, a collaboration to undertake CCA within the organisation is driven by a normative aim and perception of being one unit.

The collaboration between Municipality A and the sewer utility company consists to the extent of regulated interactions.

“ ... so the waste-water-plan (...) it is very specific right; because it is a sector plan where we transform the things we reported to the climate change adaptation strategy and so they become a focus in the waste-water-plan. We believe that there should be coherence (...) we are a company and the word collaboration sounds unbelievably good and our way to collaborate as an active company in the city is to report the problems.” (Utility A, 2013, own translation)

It is safe to say that in this case collaboration can only exist within the legal frame. The *regulative pillar* is built upon the things one must do by *ensuring certain behaviour*. If this is not fulfilled, there will be *sanctions* cf. Scott’s three pillars of institutions in sub-section 6.2.1. With the municipal reform, the utilities became privatised, meaning that their collaboration has to be within the legal frames. In this case, the collaboration to undertake CCA between the municipality and the utility is constrained and driven by regulations (Municipality A, Utility A and B).

8.1.2 Collaboration Between Sectors

In relation to collaboration with other sectors within the municipalities, only one of the municipalities (A) has a cross-sectorial collaboration. The collaboration is between the Technical Administration and The Social Sustainable Development Administration as well as the three utility companies. The representative from the municipality explains that The Social Sustainable Development Department functions as the coordinator on CCA between the sectors (Municipality A, 2013). In relation to collaboration across sectors within the municipality,

Table 9 illustrates that none of the other municipalities work across sectors within the municipalities. This indicates that it has either not been relevant to the municipalities to do so, or that there is not a culture to do so, i.e. that the different departments/administrations work in *sector silos*.

8.1.3 Collaboration with other Municipalities

In relation to collaboration with other municipalities, none of the municipalities are in any actual collaboration to recognise common opportunities and challenges. One municipality points at a neighbouring municipality as a potential municipality to collaborate with. Another representative from a municipality points out that a potential cross-municipal collaboration could be about using the same scenarios across the municipalities.

“The only thing that we have considered is the collaboration with other municipalities; in that we use the same factor to calculate how much the sea will rise here... other than that it would be crazy. In relation to that we have talked about collaboration and to use one another as a sparring partner in the erfa-group” (Municipality D, 2013, own translation)

The lack of collaboration between municipalities could be explained by how far they are in the process of integrating the CCA plans into the MSPs. As Table 8 showed, only Municipality A had a CCA plan, while the remaining municipalities were in the initial phases. However, as the quote indicates, there is a mimetic approach in a situation of confusion, meaning that there is a culture in sharing knowledge and information if needed through ERFA-groups (see sub-section 6.2.1).

8.2 Summary of Part I of the Analysis

Part I of the analysis illustrates the status of the current situation for the participating municipalities when undertaking CCA. The status consisted of a review of how far the municipalities are in integrating CCAP into the MSPs, see Table 8. Additionally, the analysis also provided a review of the current (i.e. March/April 2013) horizontal collaboration between the municipalities and utilities, other sectors and other municipalities. This part of the analysis revealed that at present (March/April 2013) collaboration with sewer utility companies was driven by *cultural* (Municipality B, D, E and F) and *normative* (Municipality C) mechanisms. The analysis also revealed that the *regulatory frames* functioned as both a driver and a barrier at the time (March/April 2013) for horizontal collaboration between Municipality A and Utility A. Utility C confirms this statement in relation to how they collaborate within their municipality. In relation to cross-sectorial collaboration, Municipality A was the only municipality to collaborate with other sectors. The last part of the analysis was a review of the horizontal collaboration between municipalities when undertaking CCAP, showing that there were no such collaborations at the time (March/April 2013).

9 Part II of the Analysis: Institutional Mechanisms

Part II of the analysis seeks to uncover the institutional mechanisms by identifying *regulative, normative and cultural-cognitive* elements that function as barriers and motivation to horizontal collaboration. As it is difficult to make a sharp distinction between the regulative, normative and cultural-cognitive pillars, the interview questions were designed as narrative questions followed up by confrontational questions leaning towards the pillars (see sub-section 4.2.2 of the Methodology). Overall there are three main categories in the analysis: the regulatory, cultural-cognitive and normative elements. (see sub-section 6.2.1) All the following sections are built upon identifying functional barriers and motivations to horizontal collaboration across sectors and municipalities when integrating CCAP into the MSPs.

9.1 Regulative mechanisms

This section is concerned with the regulative elements that constrain existing horizontal collaboration and the elements that can motivate future horizontal collaboration. During the review of the interviews, the most significant findings of regulative barriers and motivations to horizontal collaboration between municipalities and utilities, and between municipalities were that the legislations functioned as both constraining horizontal collaboration and, in the same time, legislations also functioned as motivation to horizontal collaboration when integrating CCAP into the MSPs.

9.1.1 Sectors and Plans

In relation to horizontal collaboration between municipalities and sewer utilities, legislative barriers were mentioned by the representatives from Municipality A, sewer utility company A and the NDR. According to municipal official A, the privatisation of the sewer utility companies makes it harder to collaborate because it restricts the extent and willingness of the sewer utility companies' ability to collaborate. In their own words the municipal official explains:

"A significant barrier in relation to [horizontal] climate [adaptation] collaboration is this regulation of the whole sewer area. The privatisation of the whole sewer area where they [government] have said now you have to privatise these companies and the fee has to be approved central in Copenhagen by the Ministry of Finance"(Municipality A, 2013, own translation)

It can be argued that what municipal official A is experiencing when collaborating with the sewer utility companies yields to the concept of *sector silos*. The concept of sector silo is derived from the rational and hierarchical organisations led by bureaucracies. In addition, it can also be argued that because these organisations are divided into silos they also lean towards Max Weber's view of workers in bureaucracies being framed within *iron cages* and action from the workers comes from the top in the form of regulations.

In a different case, the representatives from sewer utility companies A and B express, through giving examples, that collaboration is actually required and is regulated by law:

"... So the municipality is an authority and has to comply with the environmental law and we [sewer utility company] have the water-sector law. Those two things are not synchronised in order to fit, however, the

environmental law requires that one should, for example, make a discharge permit and that one should make some § 5 approvals and that one should make a sewer-water plan and if one is following it, then they [municipality] set the demands and then we execute the demands and this is the most simple form of collaboration. The problem is just that they [the municipality] want to set demands and then to set more demands and then you [sewer utility company] have to pay. That, I think, is difficult to collaborate about” (Utility A, 2013, own translation)

In relation to this issue the NDR representative also mentions legislative barriers. These barriers are focused on certain assignments which are regulated by law and have to be solved. In many cases it is explained that the different tasks that the municipality have to solve by law do not comply with other laws. In addition, there is a need to synchronise or create these laws so they comply with each other:

“... then there is some things in relation to exactly the river basin plans where climate change adaptation needs and the water-sector plans goals are in direct coalition with each other and this is indeed something that calls for a solution that is above the municipal and regional level. It is necessary in the next generation of river basin plans to incorporate climate change adaptation perspective because it does not make any sense to stop the streams to improve the water quality when it is also needed to lead more water to the streams because of rain” (NDR, 2013, own translation)

It is clear that legislation concerning different tasks incorporated into different municipal sectors function as barriers between the sewer utilities and the municipality when the municipalities have to undertake CCAP. In addition, it can be argued that CCA cannot be seen as one thing to manage on its own because the municipalities have a need to be able to collaborate with the sewer utility company to cope with the changing climate. The sewer utilities see themselves as collaborating with the municipality through the law as a “demand and execution collaboration”. However, since the municipality are the authority who has to integrate CCAP into the MSP, they have a need to collaborate that goes beyond the regulated collaboration. At the same time, the utilities have a need to know to what degree they are allowed to collaborate (Municipality A, Utility A and B). The NDR gives a more holistic point of view on the legislative barriers, pointing out that there are several legislative barriers related to other tasks, such as the river basin plans.

In the case of legislation being a regulatory barrier and motivation, it is evident that legislation concerning the role of different sectors and in relation to other plans functions as a barrier to collaboration.

9.1.2 Motivation to Undertake Climate Change Adaptation Planning

Table 10 provides an overview of the municipalities' motivation to prepare a CCA plan. The motivation is drawn on the basis of the interviewee's answers in regards to what their motivation has been. By using the three institutional pillars, the mechanisms that caused the motivation to initiate the planning process will be identified in accordance to each municipality.

Table 10: Motivation to prepare a CCA plan (x) illustrates a secondary motivation to prepare the CCA plan.

Municipality	A	B	C	D	E	F
Regulative		X	X	X	X	X
Normative	X					
Cultural-cognitive			(X)	(X)		

In

Table 10, an x in the *normative pillar* represents a municipality, whose motivation is that they should adapt to CCA by preparing a strategy and action plan. An x in the *cultural-cognitive pillar* represents a municipality, which already has a culture of planning for CCA, which makes the required CCA plan a natural continuation of their present work. An x in the *regulative pillar* represents a municipality who has prepared a climate adaptation plan, because they are required to do so by the government.

Table 10 shows that five out of the six municipalities' main motivation behind preparing the climate adaptation plan has been the agreement between the Danish government and the LGDK, and therefore a *regulative* motivation. Only one of the six municipalities has prepared a plan, because they believed they should (*the normative pillar*), while two municipalities, C and D, mention that they are already thinking about CCA in their work, which indicates that there is an *emerging culture* about incorporating CCA in planning. These findings will be elaborated in the following paragraphs.

When asked about why the municipalities have begun to plan for climate adaptation, most of the actors reply similarly to the representative from Municipality B:

"...we knew it would come as a demand [from the government]. That has been the motivation to start the climate adaptation plan, that's all there is to it" (Municipality B, 2013, own translation)

This quote and the similar answers from Municipality B, C, D, E and F, indicates that if the regulation passed by government in early 2013, making the local authorities prepare a CCA plan had not been passed, most of the interviewed municipalities would most likely not have prepared a CCA plan. This shows that *regulations* are clearly a motivating force in CCAP.

9.1.3 Summary

This section shows that there are both regulative barriers and motivational mechanisms to horizontal collaboration between sectors and municipalities. In terms of collaboration between utilities and municipalities, the privatisation of the sewer utilities is recognised as a barrier by the actors. It has led to a clear separation of the two organisations, which in some cases have enhanced the sector silo tendency.

Furthermore, some aims of for example the river basin plans are in contrast to what could be aims in the forthcoming CCA plans. This could lead to conflicts between the municipalities in terms of what to prioritise and could possibly hinder common CCA actions. However, integrating CCA in the river basin action plans is mentioned as a motivating force for collaboration between municipalities. These planning processes are formalised and if integrated, the regulated process would impose the municipalities to collaborate. Overall, regulations imposing the municipalities into making CCAP, not surprisingly, work as a motivational force to undertake planning related to the issue. This was seen in

Table 10, which showed that a vast majority prepared CCA plans because they are imposed to do so. This indicates that regulations in the area could be needed in order to enhance collaboration between municipalities.

9.2 Normative Mechanisms

This section is concerned with the normative elements that drive or hinder horizontal collaboration between different sectors and between municipalities when the municipalities have to undertake CCAP.

The *normative* mechanisms are built on what ‘we should do’ and include *values* and *norms* cf. Table 5 p. 11 (Scott’s three pillars). The values are concerned with *what is desirable* and the norms for how things *should be archived* as it should be in the *right way*. In addition, the Danish municipal organisation is characterised by a hierarchical organisation where values, norms and goals are formulated by politicians and officials. For CCA to be successfully integrated, the institution as well as the physical structures should be adapted in accordance.

As organisations are supported by institutions and the institution is supported by the *regulative, normative and the cultural-cognitive pillars* one could argue that the *normative pillar* in this case calls for politicians to recognise the importance of adapting the physical structures in the municipality. That requires integrating a new norm set into the political agenda and thus the *normative pillar* of the institution could be adapted to withhold norms, values and goals of CCA. When CCA becomes integrated into the *normative pillar* of the institution then it will from an ideal point of view open for horizontal collaboration to undertake CCA. These ideas will be elaborated on and evidenced in this section.

9.2.1 Normative Political Aims and the Motivation to Plan for Climate Change Adaptation

According to the municipal officials from Municipality A, E and F, the municipalities’ politicians’ *normative goals* are to be considered as barriers to CCAP and therefore a barrier to horizontal collaboration. It is up to the politicians to make CCAP a political agenda and as different city councils perceive CCA differently, the view of how to address horizontal collaboration when undertaking CCA will be different (Municipality A, E and F).

”In addition to that there are different city councils there will also be different political majorities and different conceptions of what is right and wrong or how one will prioritise the effort. In addition there will be a difference of how urban municipalities and rural municipalities considers the problems per say” (Municipality E, 2013, own translation)

The quote also illustrates that there is a potential barrier in creating collaboration between rural and urban municipalities. This most likely has something to do with the different political priorities, resources and planning culture and illustrates how sector silos can affect collaboration.

On one hand it can be argued that there is a perception that it is only if there is a need to collaborate on CCA efforts, that it becomes necessary to do so. This can be considered as a form of a *normative* barrier because adapting to CC becomes a matter of

an administrative task that only has to happen within the geographic municipal border (Municipality A, E and F). On the other hand, the perception of municipal officials can also be considered as a *normative* barrier to horizontal collaboration to undertake CCAP.

“Concretely to Municipality E, I do not see the need as significantly big but again we are in a special situation because partly we are not affected by the sea environment and all the streams in our municipality begin in the municipality and runs through other municipalities, so it is our neighbours that are effected and not us” (Municipality E, 2013, own translation)

It can be argued that in this case the municipal official from Municipality E does not consider horizontal collaboration as a need because Municipality E is not affected in the same way as the neighbouring municipalities (Municipality E).

In addition, a *normative* barrier could also be that the municipalities experience different challenges and therefore the norms, values and goals to solve the issues in collaboration are almost non-existent on a political level. According to Municipality C, the *“challenges are also too different, so something would be relevant in one place and in a different place it would be something they do not take as a big challenge” (Municipality C, 2013, own translation)*

Municipality A argues that the political willingness is very important and in their own words the municipal official explains that:

“The organisation is the most important. No matter what you talk about. What is so tragically is that the most spend so much time on the two other things; they fight for that the legislations are there and to understand and to gain knowledge. It does not mean that it is not important but if the organisation is not supporting, then [collaboration] will be very, very difficult and become a barrier” (Municipality A, 2012, own translation)

In order to get the attention of the politicians and to make the municipal officials and politicians prioritise CCAP, the representative from the NDR argues that awareness amongst politicians should be created:

“Primary by talking [climate change adaptation] up; that it should happen and by making resources available and then to offer a professional perspective. If we could offer the professional insight that the municipalities cannot afford to have then it would be a stronger offer than what the municipalities are offered now” (NDR 2013, own translation)

One could argue that collaboration is very important within CCA (Lund et. al, 2012; Bulkeley, 2010; Biesbroek, 2010). Therefore, the conception of the importance of CCA in the municipalities of both the municipal officials and the politicians can function as a barrier to CCA. The need to coordinate efforts to recognise common issues and opportunities is further into the planning process, as it was experienced by Municipality A. The municipalities only see a need to coordinate standards to create unity in CCAP e.g. same dike heights and rain scenarios (Municipality F and NDR, 2013).

In relation to these perspectives, Table 11 shows that only Municipality A prepared a CCA plan because they experienced damaging floods and felt a need to take action.

Their CCA plan was prepared even before the regulation was passed. Municipality A believed they should take action, before being *regulated* to take action, contrary to the cases of the other interviewed actors. The reply from Municipality A indicates that the need to take action influenced their motivation to do so. When asked about their experience with flooding, Municipality B, C, D, E and F replied that they have experienced some flooding but to a lesser degree than elsewhere in Denmark. The fact that municipalities B, D, E and F have not experienced damaging flooding to the same degree as Municipality A could very well be an indicator as to why their motivation to prepare the plan is purely based on the government *regulating* actions.

Table 11: Motivation to prepare a CCA plan (x) illustrates a secondary motivation to prepare the CCA plan.

Municipality	A	B	C	D	E	F
Regulative		X	X	X	X	X
Normative	X					
Cultural-cognitive	X		(x)	(x)		

9.2.2 The Normative Perception of Need to Collaborate through Network Steering

In addition, the municipalities and the NDR were asked if, in their opinion, there was a need to collaborate as literature concerning CCA governance advocates collaboration is to create synergy and avoid obstructionist systems. Collaboration in this context will be built on the characterisations of *network steering* where there is a relatively stable horizontal connection of interdependent actors influencing each other through negotiations within an institutional framework, where the actors to a certain extent are self-regulated. The outcome of the negotiations through network steering is highly contributing to public steering.

The results of the interviews will be analysed in order to examine what their arguments for and against collaboration is based on. In overall terms, Table 12 illustrates the answers of the municipalities and NDR.

Table 12: The need for collaboration between the local authorities. (x) marks local authorities which states that they themselves do not have a need to collaborate

Municipality	A	B	C	D	E	F	NDR
Collaboration is needed	X	X	X	X	X	X	X
Collaboration is not needed					(X)	(X)	

The table shows that there is consensus between all the local authorities, as well as the regional authority, that there is a need to collaborate and co-ordinate actions when planning for CCA among the municipalities. The table also illustrates that Municipality E and F state that they do not have a need to collaborate with other local authorities,

however they consider it to be a good idea in cases where collaboration is needed (see Table 12). Table 12 does however not illustrate the nuances of the answers, and will therefore be elaborated below in terms of their arguments for the need to collaborate.

First of all, the municipalities all believe that there are great parts of CCA actions which can be undertaken at a local level, *“where one easily can restrict oneself to playing, that the municipality is an island”* (NDR, 2013 own translation), i.e. the municipality can be seen as an isolated unit. In addition to this, it can be argued that the administrative borders function as *iron cages* for the municipality when it comes to CCAP.

Additionally, Municipality E and F, see Table 12, state that collaboration would be irrelevant for them. Municipality F states that they do not share any streams with other municipalities and Municipality E argues that the amount of water running in streams from their municipality to another is very limited. Therefore, they do not see a reason for them to collaborate with others; however believe that it is a good idea to collaborate, where there is a need to do so.

The need for collaboration has not yet been presented to the regional authority, whose role would have been to facilitate between the municipalities as a neutral party if they need facilitating. In relation to this, the representative of the regional authority states:

“The local authorities are aware, that one must talk about these things, but what they say in my experience is that “we simply cannot do it. We’re not there yet. There are so many unclear parameters, so this, this we are not ready for yet. We know it can become a problem, but maybe we will not make it in this round”. And I am like, fair enough, there is no need to panic here” (NDR, 2013)

The quote illustrates the same image one gets after interviewing the local authorities: The local authorities believe that collaboration is or will be necessary, but do not have time to integrate it in the first generation of their CCA strategies and action plans. In terms of the three institutional pillars, this illustrates that there is a normative perception in the local authorities that they should collaborate.

As stated, the local authorities believe that if there is a need to collaborate, they should. In relation to this, the local authorities mention the Limfjord, the costs and common streams (such as the stream, which runs through three municipalities in the region) as relevant geographic areas for collaboration (Municipality A, B, C, 2013). In particular, the Limfjord is mentioned as an area where *“we have a mutual destiny”* (Municipality A, 2013). Furthermore, it is not only concerning particular areas that collaboration is needed. Also, in terms of using the same scenario to undertake calculations of flooding, the local authorities see a necessity, as it would not make sense to use different scenarios within the region (Municipality A, B, C, D, 2013).

However, municipal official A also mention that the municipalities will sooner or later realise that they have to collaborate in order to implement CCA measures. As Municipality A is the one out of the six municipalities that are furthest in their CCAP, they have already experienced that it will become harder to ignore that there is a need for horizontal collaboration once the municipalities reach the implementing phase.

"I do not doubt that in the near future, someone has to lead the horizontal collaboration in order for us [municipalities] to implement our adaptation plans(...) When you reach the implementation phase you realise that some things you cannot decide on your own and that you need your neighbouring municipality, then the collaboration will come."(Municipality A, 2013, own translation)

Municipal officials from Municipality C agree that horizontal collaboration is important in order to create the same rules and ways to handle CCA. This comes from the fact that the municipalities have farmers with agricultural land located in several municipalities. Therefore, rules have to be coordinated in order to deal with these types of actors. This could also be the case when it comes to CCAP (Municipality C). A representative from Municipality C states, what is needed to foster this coordination:

"Yes, interdependency or a political wish to handle the agriculture in the same way in the Limfjord area" (Municipality, C, 2013, own translation)

When it comes to networks in the form of horizontal collaboration, all municipalities and the NDR, except for Municipality E, agreed that to some extent there is a need to collaborate in networks. Municipality F argues that it should be possible *"to get some outputs in the network"* (Municipality F, 2013, own translation) and Municipality D supported this view. However, it should be voluntary to participate and *"not something you have to"* (Municipality D, 2013, own translation). The officials from Municipality C explained that the CDR has invited all Danish municipalities to participate in their development of a template for CCAP, which is something that the NDR did not do (Municipality C).

Municipality A explained that the way different municipalities approach tasks and their view of how to handle e.g. nature also has an effect on whether or not they will collaborate in networks. The municipal official explained that if they wanted to use natural recipients and the other municipalities wanted to build dikes then it is difficult for one municipality to convince the plot owners to think that using their land as a recipient is a good idea. This idea is built on the logic of common geographical issues. Another *logic* which the municipal official also mentions is the logic behind that it is difficult to convince others to coordinate something on a voluntary basis when it is planning related (Municipality A, 2013).

9.2.3 Summary

This section illustrates that there are both normative barriers and motivating mechanisms for horizontal collaboration between municipalities. In terms of barriers, the interviewees point out that every municipality has different political aims and priorities. This difference is particularly large between urban and rural/outer municipalities because of different norms, values and resources. Having different political aims and priorities prolong the decision making process and prevent good network steering which focuses on creating common grounds. In relation to the political normative barriers, the interviewees also point out time constraints as an issue. CCA has not been a prioritised subject amongst the politicians, which leaves the officials little time to prepare the CCA plans. With little time to begin with, could reduce the incitement to take the time to collaborate with other municipalities. In terms of motivating forces, it is pointed out that creating a political awareness on both the

local and regional level about the issue, could enhance the collaboration between municipalities as well as CCAP as a whole. The interviewee from the NDR points out that another motivating force to enhance collaboration could be to have resources or tools available which foster collaboration. In addition to this, it is suggested by the NDR representative that the region could contribute with professional insight and assistance in the collaborative processes, which could make it easier for the municipalities to collaborate. Finally, it is worth noticing that there is a normative perception amongst the municipalities that collaboration is necessary, which shows an already existing normative motivating force to collaborate.

9.3 Cultural-Cognitive Mechanisms

This section is concerned with the *cultural-cognitive* elements that hinder existing horizontal collaboration and the elements that can motivate future horizontal collaboration. The cultural-cognitive pillar is concerned with *what we usually do* and therefore contains the *mimetic processes and mechanisms* cf. Table 5 p. 11 (Scott's three pillars). As institutions are built to be passed from generation to generation, it influences by mimetic processes behaviour in accordance to what we usually do and then what we usually do becomes taken-for-granted. Within the municipal organisational structure there is a *coexistence of own internal norms, cultures and procedures* that could function as a barrier to horizontal collaboration across the professional sectors, referred to as *professional silos* (Wejs, 2013). In relation to this, the term *sub-cultures* can also be used, meaning that, there are "*different taken-for-granted knowledge in separate departments where the parties involved may speak different professional 'languages', which causes a lack of common grounding and understanding.*" (Wejs, 2013) This could also be argued in terms of horizontal collaboration across municipal borders. In the following, the *culture* of the *certain professional silos* within the municipalities will be elaborated to identify barriers and motivations to collaborate in undertaking CCAP.

9.3.1 Existing Collaborative Planning Culture between Municipalities

The municipalities were asked if they believed a culture to collaborate horizontally exists on a general planning basis. This question was asked to examine *the cultural-cognitive institutional pillar*. If there is a culture to collaborate in planning in general, this culture could possibly be transferred to horizontal collaboration when undertaking climate adaptation planning, and hereby act as a cultural motivating force. The findings in relation to this question are presented in Table 13.

Table 13: The culture of collaborating horizontally amongst municipalities

Municipality/ Region	A	B	C	D	E	F	NDR
There is a culture	X	X	X		X	X	X
There is no culture				X			

The interviewed municipalities were directly asked if they believed there is a culture to collaborate in planning and then to give examples. The table indicates that there is a broad agreement on, that such a culture exists. However, it is not all who agree as Municipality D argues that there is not a culture to collaborate. The answers illustrated

in Table 13 acts as a broad simplification of the answers given. Therefore, Table 13 will be elaborated upon in order to bring out the nuances of the answers.

Municipality A and C point out that this culture to collaborate has grown since the municipal reform in 2007:

“It [collaboration] has happened a lot concurrently as the local authorities have been given more responsibility followed by the municipal reform, it is more significant to have a good collaboration (...) Before 2007, well (...) the environmental work of the municipalities were less political and more administrative, than after the tasks of the county authorities also came over to the local authorities, and these environmental tasks with sustainability and climate has come as well” (Municipality A, 2013)

The cited interviewee from Municipality A states that the changing role of the local authorities has created a greater need to collaborate with other local authorities concerning subjects which cross the municipal boundaries. Municipality C points that there has been a growth in collaboration since the municipal reform and furthermore states that right after the municipal reform, the municipalities were busy comprehending their new tasks, putting the collaboration with other sectors and municipalities in the background until two or three years ago (Municipality C, 2013).

In order to bring out further nuances of the answers, the following list presents subjects or areas of which the local authorities states that they are collaborating about. The list will be elaborated below.

- Exchange of experience through the *erfa-networks* created by both LGDK and The NDR (Pointed out by all municipalities)
- Concrete projects (Pointed out by Municipality C and D)
- Co-ordination of rules for farmers (Pointed out by Municipality A and C)
- The water- and nature plans (water plans: through Limfjordsrådet) (Pointed out by all municipalities)

Specifically, the *erfa-networks* are mentioned by all the local authorities as a main area of collaboration. Here, the municipal officials meet voluntarily in a professional forum every quarter to discuss various subjects and share their knowledge and experiences related to their particular field. Furthermore, several of the interviewees point out that the *erfa-networks* are also beneficial outside the arranged meetings, as they can contact each other informally when issues arise because they know each other through the *erfa-networks*. According to the interviewees, the *erfa-networks* are a very beneficial form of collaboration as it allows the participants to discuss concrete issues, which they are currently working on. In relation to this, the representative from the regional authority states:

“I think we have a very pronounced culture in the North Jutland sector here, to work together and solve the problems, and everyone knows, that we do not have as many resources as Gentofte Municipality (...) And the best resource we have, is the knowledge we can share with each other. That is how I experience my collaboration in Northern Jutland. So I do not think there is a culture about that you cannot collaborate per se.” (NDR, 2013)

The quote illustrates that the exchange of knowledge is of great importance for the local authorities because they do not have resources to acquire experts in every field of the administration to undertake specific tasks. In relation to this, the representative of NDR furthermore states that the specialised work forces concerning, for example, water and nature management were gathered in the regional authority before the municipal reform in 2007, and that these specialists are now spread out in the local authorities and because of this, it has lost some of its strength (NDR, 2013). Therefore, the erfa-networks are an important platform to gather the expertise and for them to share their knowledge. (NDR, 2013)

In relation to the erfa-networks, it is also worth noting that these were also mentioned by Municipality D, which is the only local authority answering no to the question of whether or not there is a culture to collaborate horizontally. This shows that there are different opinions on what defines collaboration amongst the local authorities.

The concrete projects mentioned concerning areas of collaboration, are projects and networks which require collaboration, for example, wind turbine projects near municipal boundaries or when one municipality's water utility supplies water to another municipality (Municipality C; D, 2013).

The co-ordination of rules for farmers is mentioned by one local authority as a subject of collaboration. They co-ordinate these rules because the large farming estates own land in different municipalities and therefore *"would like some homogenous rules and some homogenous things, and where the authorities are not running in opposite directions."* (Municipality C, 2013). The local authorities thus make sure this happens by co-ordination of the rules. Finally, the authorities are collaborating on the river basin and nature plans:

"The water- and nature plans, there you sit concretely together and make a plan, and it is not often that happens in other areas. (...) It is not easy to make water- and nature plans, but what is after all doing it [easier] is that the state has made the aims and that we are making the action plans"
(Municipality C, 2013)

Municipality C express an important point in relation to that the local authorities mainly collaborate through knowledge experience networks, while collaboration concerned with co-ordinating actions are not formally organised to an equal degree, except when it comes to the river basin action plans. Furthermore, the municipalities are not creating the aims and goals for the areas affected by the river basin action and nature plans but are rather agreeing on the actions that are needed to fulfil the aims and goals. This indicates that there is no culture to undertake entire planning processes in horizontal collaboration with other municipalities. Rather, it is the existing collaborative culture i.e. the erfa-networks that are centred on exchange of experience and knowledge, which could be considered as a great part of the development and content of networks, as pointed out in sub-section 6.1.2 of the theory. With no culture of forming common goals and undertaking planning processes together, the planning culture in general could thus act as a barrier for horizontal collaboration.

9.3.2 Existing Culture to Plan for Climate Change Adaptation

According to Table 14, municipal officials from Municipality C and D state that they are currently adapting for CC in their daily work, but that it has not yet been written down in an actual plan before now:

“...these other things [implementing separate sewage systems and retention basins] have been running parallel, and then one can call it climate [adaptation] or not. There has been a problem and then one has wanted to solve it, so it is not like the course will be changed by making a plan”
(Municipality C, 2013, own translation)

It can be argued that in the case of Municipality C and D natural events have also functioned as a mechanism. The natural mechanism’s causal powers have led the municipalities to take action rather than the social constructed mechanisms. In addition to this, the quote also illustrates that the municipality integrates CCA into the existing processes. Hereby the mimic the existing structures in planning for CCA and do not consider the subject in a broader cross-sectorial sense.

Table 14: Motivation to prepare a CCA plan (x) illustrates a secondary motivation to prepare the CCA plan.

Municipality	A	B	C	D	E	F
Regulative		X	X	X	X	X
Normative	X					
Cultural-cognitive	X		(X)	(X)		

According to municipal officials from Municipality C and D, there is an emerging culture to adapt to CC today, albeit not on the basis of a distinct formal plan, but rather on the basis of need or of one of the sector plans mentioned in section 5.2. Hereby, this illustrates a normative mechanism to take action, because they believe they ought to.

9.3.3 Integrating Climate Change Adaptation in the Existing Culture

Integrating CCA in the river basin action plans could also prove to be a difficult task:

“One could say that there are some collaborations [centred] around the Limfjord in regards to the river basin plans...however when it comes to climate and water, then it is something that you pour out. In connection to climate [water] it is take-for-grantedness”(Municipality C, 2013 own translation)

According to Municipality C, it is obvious that CCA is reduced to be about the management of water which normally is handled within the administrative municipal borders. Dealing with too much water has been something managed by building bigger pipelines or more recipients, and not a matter of a threat, which act as a cultural barrier. Dealing with water has been taken for granted and therefore this barrier leans up against the cultural cognitive pillar (Municipality C). The municipal official from

Municipality A explains that there have been attempts to try and create collaborations concerning CCA but some advocate it while others advocate against it (Municipality A).

"there has been discussions about to which extent it was a good idea to establish collaborations centred around climate change [adaptation] but it proved to be a barrier. The answer until now has been "no we don't think so" so there has been some arguing for it [collaboration] and some arguing against it [collaboration]" (Municipality A, own translation)

Another cultural barrier is explained to be found in the *professional silos* as they have their own norms, cultures and procedures and these influence the way they handle similar tasks. In some municipalities it is the urban planners and in other cases it is the environmental planners within the municipality who are undertaking CCAP (Municipality A, B, C, D, E and F).

"The complications have been that we [municipalities] didn't start up in the same way. The barrier in relation to this has (...) been that so far it has been placed differently. Some municipalities it is situated in the planning department and in some in the environmental department. And the municipalities where it is situated in the environmental department which also are those who are represented in the Limfjord council (...) they have the responsibility for the climate strategy, they think it is a good idea to collaborate, those environmental chiefs that do not have it [responsibility] because it is the planning departments chief who has it [responsibility] have difficulties in committing the municipality to engage in a collaboration, so therefore there are no collaboration" (Municipality A, 2013 own translation)

Another cultural barrier to horizontal collaboration between municipalities is to be found in the staggered processes of when the municipalities undertake different tasks, including CCAP, along with the staggered information from the government. The staggered information from the government has been developed at the same time as the municipalities were imposed to undertake CCAP. This is mentioned by Municipality C, D and E.

"...the biggest barrier is that we are not synchronised, that we simply [are not] the same place to take up the discussions (...) one could say that the river basin plans (...) being (...) dictated meant that we were at the same place at the same time and it worked well (...) but this is something that the networks can [synchronised processes] and it would help to drive us into same directions (...) because it is really difficult if the others have already made their own [plans] a year ago and then we ask them if it would be exciting to talk to us, it isn't because they are at a completely different place. So yes being synchronic in movement [processes] is difficult in a municipality because politically the prioritisation is different" (Municipality C, 2013, own translation)

There is also a barrier in the way of taking decisions. Officials from Municipality A, B, C, D and E explain that it is much easier to take the decisions individually than to take the decisions in a network because it slows the decision-making process down.

"It is much easier, we know that from own experience, if a decision is to be taken then it is faster to decide it individually, if you firstly have to ask the wife then it will take double the time and if you have to talk to ten people then it will take a lot of time" (Municipality A, 2013, own translation)

Municipality A further explains that if there is something that the government is not good at, then it is implementing projects and this means that, on one hand, the municipalities are good at doing so, however on the other hand, they are not good at doing something they are not forced to do (Municipality A and E).

"If there is something that the state cannot do, then it is to implement and to that there are many examples of, however what the municipalities struggle with is to collaborate about something they are not forced to. And it's not because they don't want to collaborate or that the politicians do not like each other; that is misunderstood. It is because they do not have enough resources. They have to do so much more than they have resources to and therefore initiating collaboration will cost more resources" (Municipality A, 2013, own translation)

According to the quote, the lack of horizontal collaboration to undertake CCA plans happens because the municipalities lack resources and establishing horizontal collaboration requires resources. The lack of resources and the conception of collaborative processes being time consuming are argued as being the causes to the lack of horizontal collaboration. Including multiple actors collaborating in a steering network to cope with CCA, can thus be considered to be a cultural barrier, because it requires many actors to agree on how to proceed. This illustrates how the *sub-cultures*, mentioned in the introduction to this section can influence collaboration, if the actors do not share the same common grounding and understanding of the subject, but rather have a different taken-for-granted knowledge (Wejs, 2013).

As such one could argue that the lack of resources and knowledge of how to take CCA actions results in confusion, as oppose to the stability and routines mentioned in relation to the *cultural-cognitive pillar*. The confusion comes as a result of the parameters of the process being blurred and thus the municipalities do not know how to undertake CCAP as it is not yet supported by the *cultural-cognitive pillar* (NDR & Municipality F):

"...what I experience them [the municipalities] saying is; we simply cannot; we are not there yet. There are so many parameters that are blurry [right] now, we have not yet arrived ... We know that it can become a problem, however, it is unsure if we will reach it [horizontal collaboration] in this round." (NDR, 2013, own translation)

In addition to this, horizontal collaboration requires political agreements and a set of normative goals, which Municipality E explains will be difficult to reach. The municipal official from Municipality E further explains that by lifting the collaboration to a regional level it will make the process easier when the decisions are to be made.

"if it were the region that had the responsibility then it would be (...) easier to decide individually than 10 – 20 city councils agreeing amongst each other, however, it should be seen in relation to who is actually doing

something. Because there should be correspondence between those who decide and those who take action to ensure that it will be realised” (Municipality E, 2013, own translation)

The quote illustrates the importance of integrating the potential regional decisions into the existing planning culture at the municipal level, and a wish to be able to undertake mimetic processes in the planning process, as a correspondence is desired. In addition to this, the quote also illustrates that there is a culture in the municipalities of wanting decisions to be taken quickly, because of the normative perception that it is easier to make decisions individually.

9.3.4 Summary

The section shows that there are both cultural-cognitive barriers and motivational mechanisms for collaboration. Through the interviews it became clear that there is not a culture among the municipalities to undertake entire planning processes in collaboration with other municipalities. The river basin action plans are however prepared in collaboration, but without the goal setting phase of the planning process, as this is undertaken by the national government. Another cultural barrier lies within the location of CCAP in the municipal administration. Some municipalities have located the task in the planning department, while others have located it in the environmental department. This is a barrier, as it is hard to establish a network between different departments in different municipalities because of the sub-cultural and sector silos phenomena. Furthermore, the municipalities are not used to coordinating planning tasks and have not begun to undertake CCAP at the same time, leading to staggered processes. This is a barrier for collaboration because it rules out the opportunity to create goals and choose actions together, when the processes are not synchronised in terms of time. The municipalities have also experienced time constraints not only in relation to political deprioritisation but also due to the late release of governmental guidance. This indicates that the municipalities are dependent on this information, which could be grounded in the fact that the culture about planning for CCA is still merely emerging among the municipalities. CCAP and collaboration about the issues are still not established subjects within the municipalities. Finally, there is a culture in the municipalities of wanting decisions to be made fast. This also act as a barrier to collaboration, because it requires more time for several municipalities to agree on aims and actions, than if the decisions can be taken within one municipality. The analysis however shows that there is a culture among the municipalities to engage in various networks. This could act as a motivational mechanism for collaboration, as some of the actors know each other and know how to act in networks. In relation to this, it is also pointed out by the interviewees that the creation of a constructive, voluntary network about CCA could act as a motivational mechanism for collaboration. Finally, some municipalities suggest that the regional authority could function as a facilitator in a collaborative planning process.

PART FIVE

IN CONCLUSION

This fifth part of the thesis works as a concluding part to the thesis. It contains: Chapter 10: Discussion and Chapter 11. **Fejl! Henvisningskilde ikke fundet..** The purpose of this part is to summarise, synthesise, discuss and reflect upon the findings of the prior parts of the thesis in order to answer the overall research question

10 Discussion

In this chapter the results from the analysis will be discussed. Based on the summaries in the analyses, the results are presented in

Table 15 as regulative, normative and cultural-cognitive mechanisms that motivate or function as a barrier to horizontal municipal collaboration. These findings were derived from the interview and interpreted through the analytical framework. Before going to deep into discussing the results it is important to point out that these barriers and motivations in a different setting could be reversed meaning, that if a regulation is a barrier to horizontal collaboration, one could argue, that altering the regulation could be a motivation to collaborate and vice versa.

Table 15: The results of institutional barriers and motivations to horizontal collaboration

Regulative Mechanisms			
Barriers	<ul style="list-style-type: none"> - Privatisation of the sewer utilities - Plans have constraining aims 	Motivations	<ul style="list-style-type: none"> - Integration of CCA in river basin plans - Regulations impose integration of climate change adaptation planning into municipal spatial planning
Normative Mechanisms			
Barriers	<ul style="list-style-type: none"> - Different political aims and priorities (particularly between rural and urban municipalities) - Perception of need among officials depend on their own needs - Time constraints due to lack of economic resources and political deprioritising 	Motivations	<ul style="list-style-type: none"> - Creating political awareness - Making resources available - Professional insight and assistance - A normative perception that collaboration is necessary - Regional authority could function as a facilitator in the planning process - Create constructive networks
Cultural-Cognitive Mechanisms			
Barriers	<ul style="list-style-type: none"> - Not a culture to undertake entire planning processes in collaboration - Not the same type of departments working with CCA - Staggered work processes (professional silos: norms, culture and procedure (regulations = interest) - Time constraints due to late governmental information - Culture of wanting fast decisions - CCA planning is not yet an established subject within the municipalities 	Motivations	<ul style="list-style-type: none"> - Culture to engage in networks

The overall themes of the results from the analysis are:

- 1) *“What motivated the municipalities to take action to undertake CCAP?”*
- 2) *“What are the institutional mechanisms that function as a barrier or as a motivation to engage in horizontal collaboration to undertake CCAP?”*

To answer the first question; the regulation imposed from the government was the main motivating factor to undertake CCAP for those municipalities that had not already adopted the plan. Seen in the light of CCA literature, it can be discussed how surprising it in reality is in relation to governing styles? According to Kern & Alber (2010) countries where planning traditionally is characterised by a strong hierarchical relationship between the local authorities and national government have a stronger position to oblige local authorities to develop strategic plans in sectors of relevance to climate policies { {262 Alber,G.and Kern, K. 2009}}. Kern & Alber (2009) furthermore argue that in many countries, apart from the United Kingdom, local governments enjoy a higher degree of autonomy as the relations between the state and the local authorities are inclined by cooperative characterisations. In addition to this, the national government is in a considerably weaker position in terms of its influence on the implementation of climate change policy. However, this cannot be argued to be the case in a Danish context as the government have succeeded in their policy to include climate change adaptation in planning. In addition, it can be discussed to what extent it is sufficient enough. Though the municipalities are to prepare CCA plans, the government has not regulated if they should collaborate horizontally. In the following it will be discussed if horizontal collaboration should be imposed from a governmental level or if the municipalities will engage in horizontal collaboration voluntarily, which has been the course of argumentation throughout the thesis. The discussion takes its point of departure in the latter question and by dividing it into two sub questions the discussion seeks to link the findings and to uncover:

“What could be done to cope with the barriers and to use the motivations to assist the municipalities in their process?”

Beginning with what can be derived from the analysis, it seems that CCA actions on a municipal level were a result of a regulation and it raises the question of *“to what extent horizontal collaboration should be regulated instead of recommended?”* to ensure that municipalities with a need to collaborate with other municipalities, do not stand alone. By quickly reviewing the content of

Table 15 two different solutions come to mind:

- 1) *Horizontal collaboration to undertake CCAP should be regulated from the state; or*
- 2) *The municipalities should be given time to initiate the collaboration on their own.*

Opening with the first solution; it could be discussed if the municipalities should be regulated centrally to engage in horizontal collaboration when undertaking CCAP. Firstly one could argue that because; the impacts from the changing climate are happening now, actions also need to be taken now, which calls for an efficient solution that could be regulation. Throughout the analysis; it was obvious that those municipalities, who had a need to adapt, did in fact adapt on their own initiative. However it was obvious that the majority of the municipalities' motivation came from central regulation. In addition one could argue that the government's interference led to action; if the government had not interfered, then the municipalities would not have reacted. However, given the fact that the government is governing as governance; it would firstly contradict the very essence of governance and the voluntary engagement in networks built on interdependency, negotiation and trust among the actors and thus autonomy from the state. Interference from the government would contradict the reform of the municipalities including the decentralisation of tasks, if the government were to regulate the horizontal collaboration. Lastly by looking at that CCA it is both institutional and physical changes, therefore it is important to remember, that CCA happens on a local level and by using network steering it will be possible to open up for iterative processes in the integration of CCAP into MSP, moving from the policy-making of CCA to institutional integration to implementation of solutions.

Based on these arguments, it seems both unlikely and undesirable to regulate collaboration within the Danish planning system. The arguments illustrate that using the regulative pillar to enhance the collaboration between municipalities on CCA, could prove to be problematic within the Danish planning system. The following paragraphs will therefore discuss the role of the two other institutional pillars in relation to the subject.

Moving to solution 2, it can be discussed by using

Table 15 *“to what extent the municipalities are in a position to initiate horizontal collaboration on own initiative without central government involvement?”* Based on the perception of normative values and aims concerning CCA at the political, administrative and official level within the municipality it is obvious that there is a void in the political and administrative municipal level to recognise that CCA is happening and actions should be taken. The void at the political level can be seen in the deprioritisation of CCA, as several of the interviewed municipality representatives stated, that it had not been a political priority to initiate CCAP in the first place and that there was a lack of knowledge among the politicians about the subject. The political normative conception influences the officials at the administrative level within the organisations professional silos. The goals, aims and values are formulated at the top of the municipal organisation and move to the bottom to the hierarchy and not vice versa. In addition to this the professional silos have their own language and as such their own norms, culture and procedures. This only emphasises the complexity of horizontal collaboration when integrating CCA into the MSP. In the following sections these considerations will be discussed.

Firstly, for the municipalities to be able to engage in a network concerning CCAP there should be a need within the organisation. By some of the municipalities this need should be recognised at a political level. The failure to recognise the need to collaborate is argued to be found in the political and administrative perception of that CCA should happen within the municipal administrative borders. Reducing CCA to becoming a problem of only pouring water into streams or sewages, results in CCA becoming a technical matter and its institutionalisation fades away. The lack of political support, constrains the municipal officials’ ability to participate in horizontal collaborations even though the municipal officials recognise the need of horizontal collaboration to undertake CCAP. More importantly, if the municipal politicians and municipal administration do not understand the actual complexity of CCA, it is difficult to raise resources for the officials to engage in horizontal collaborations with other municipalities. Committing the municipality to any form of network would be difficult unless the organisation realised the need of organising CCA actions through horizontal collaboration and requires a person within the municipal organisation with the ability to make decisions. In addition this proves how the rational spirits of the bureaucratic organisation imprisons the actions of the officials with their norms, culture and mimetic procedures within their given professional silos.

In some of the cases it was not only the political endorsement and perception of CCA missing. The municipal officials’ own perceptions were also insufficient when it came to CCA planning as some could not see a reason to collaborate if they themselves were not affected negatively by CC, even though they could cause an effect on others. Therefore it can be discussed, to what extent the municipal officials would engage in a horizontal collaboration centred on CCA, if the municipal officials have an insufficient understanding of CCA.

On one hand the officials’ understanding of CCA and the access to the right information were not available. Given the time constraints that the officials work under; it is difficult to imagine that a municipal official would participate and not least take the initiative to create a network on a subject which they not understand the complexity of yet. In most cases; it was stated by the officials that horizontal collaboration could be a good idea. However, the interviewees state that collaboration should be both voluntary and constructive. In addition, some argued that the network could be facilitated at a regional level. It can however be discussed if the regional politicians are more inclined to make room for CCA in their sparse regional development plan, not least because the municipal reform decentralised the vast majority of the regions’ authority concerning spatial planning. What

stands clear here is, that the municipal organisations are different from each other, they strive for different political agendas and these are both externally and internally constructed and dependent on the municipalities characteristics. If CCA is not a matter of concern in the given municipality it is hard to imagine, that the normative believe of CCA, is seen as a subject, that should be synergised across the administrative borders. However, it remains that there is no culture to collaborate on planning processes between the municipalities, as they are confused about which necessary steps to take. However, as CCA is still being integrated into the Danish planning system, confusion can be expected.

Secondly, an ideal situation for horizontal CCA collaboration would be that the participating municipalities are at the same place in the planning process at the same time, to engage in a network. This network should however be built on the idea of networks that calls for interdependency, shared interest, trust and negotiation (Sørensen & Torfing, 2005). However, a barrier to horizontal CCA collaboration is that the municipalities have staggered planning processes. The staggered processes have been argued to cause staggered interdependencies and interests resulting in an imbalance in the negotiation process. It can be discussed if the negotiation imbalance will have a negative effect on the horizontal collaboration. In sub-section 6.1.2 network steering was argued to offer all network partners something they can use in their work, even if there would be an inequality in allocation and authority. Additionally, the networks were argued to be dependent on the participating parties' knowledge, authority and resources and interdependency among the parties. Regardless to the staggered processes and the perception of CCA in the municipal organisation the municipalities have a shared normative interest and an interdependency to engage in a network about CCA. Moving from the conceptual arguments to the empirical arguments chapter 8 showed that the majority of the municipalities were more or less at the start-up and the mapping phases and though a broad divisions of the process, it can be argued that the staggered processes is more a perception of that the processes usually are staggered. This becomes a cultural-cognitive barrier to CCA planning.

Thirdly, as

Table 15 indicates, and as the previous paragraph discussed, there is a lack of culture to engage in horizontal collaboration working on entire planning processes unless the municipalities are imposed to do so. However there is a culture for engaging in what the municipal officials' refers to as *erfa-networks*. The point of these networks is to share knowledge and information of processes and solutions. The *erfa-networks* are autonomous and therefore rise and fall on voluntary participation. The participation in the network consists more or less of the same profession and results in professional relations on perceivably narrow subjects such as waste water management or ground water management creating sector silos. It can be discussed if these networks could function as a platform for horizontal CCA collaboration. If so, it seems like a new network needs to be created, as the existing are concerned with particular subjects. But even if one was created, issues could arise. On one hand these networks aim at sharing experience and knowledge and correspond with the idea of network steering. On the other hand, the *erfa-networks* do not undertake planning processes, but are, as mentioned, concerned with knowledge and experience sharing. Furthermore, the networks are voluntary. The fact that they are voluntary is important in relation to the municipal politicians, administrators and official's *willingness* to engage in a network as it depends on what could be gained. Therefore the willingness of these participators is constrained by perception, time constraints and resources. The question in relation to the *erfa-networks* is in reality if it would be sufficient enough to expect that solutions and opportunities would be dealt with because of their focus on knowledge and experience sharing and their voluntary nature.

To overcome these barriers, a culture needs to be established and the normative perception within the organisation needs to be amended. It can be argued that the culture will evolve over time, as the actors get more familiar with the issue. Furthermore, their normative perception may also change when the municipalities reach the implementation phase of their plans and potentially realise that there could be contrasting aims and actions among the municipalities. It seems however, that there is a need of employees or politicians within the municipalities to bring the subject forward and to create attention in the top of the municipal hierarchy in order to get the sufficient resources to initiate horizontal collaboration. However, it can be discussed if all these barriers were comprehended and all the motivational forces were met, if this would be sufficient enough? Would the municipalities engage in networks? The question could be answered partly by arguing that some would and some would not. In reality it is no longer a question about horizontal collaboration centred on *integrating* CCA into MSP. The question is about adapting the culture of the municipal officials and administration to accommodate CCA by engaging in networks. Networks concerned and aimed at synergising CCA planning. However, as culture is adapted by sanctioning behaviour through either regulation or legislation (*regulative*) or by formulating goals and guidelines (*normative*) that seeks not to integrate CCA but, to adapt the officials' norms, culture and procedures to undertake CCA related *mimetic processes*.

To answer the question of the discussion "*What could be done to cope with the barriers and to use the motivations to assist the municipalities in their process?*" one could argue that resources should be allocated to comprehend the barriers and to motivate the municipal officials, however as the discussion reviled, there was a lack of culture to engage in planning processes stretching over a long period of time and as CCA would be something to be dealt with far into the future the answer would be to allocate funds that seeks to adapt the municipal officials' culture in engaging in networks.

The paragraphs above showed that an erfa-network concerning CCA planning could be a potential platform, but would have shortcomings. Another platform, which could be used, is the Limfjord council where the focus currently is on the river basin action plans. This, however, limits the geographical area to only managing the Limfjord and the analysis showed, that issues in relation to the organisation of the Limfjord council sets a barrier for integrating CCA planning. One could therefore consider establishing a platform, which brings together the actors from the municipalities and invite them to set up aims and actions for CCA where there is a need to do so. This platform could be initiated by the regional authority, as the analysis and discussion showed that the municipal officials are not granted the resources to create such a platform. By doing so, the region should have a greater role in facilitating between the municipalities and possibly a greater authority.

11 Conclusion

Throughout the thesis, knowledge has been gained concerning the examined subject of horizontal collaboration between municipalities in relation to CCA, focusing on the current status, barriers and motivational forces. The aim of this chapter is to present this knowledge by summarising the answers to the four sub-research questions and the main research question.

The state of the art chapter showed, that climate change adaptation has received growing attention globally both from researchers and professionals. Though the focus has been on mitigation rather than adaptation, the parties have realised that climate change is inevitable and that implementing adaptation measures also has become inevitable both physically and institutionally. With the introduction of for example the municipal climate change adaptation plans in the Danish context, the Danish government has also taken the stance, that adaptation is necessary in the short and long term. To integrate adaptation in the municipal planning; policy and institutional changes are essential (Füssel, 2007). Spatial planning therefore plays a major role in climate change adaptation; it is through spatial planning that the policy and institutional changes can take place and in particular at the local level (Bulkeley, 2010). In relation to this, the researchers call for co-ordination and facilitation. However, the local level governments in a Scandinavian context find it challenging to co-ordinate their actions due to: lack of knowledge, both in terms of how to adapt and about the potentials of integrative planning; the lack of taking responsibility; and land-use conflicts (Lund, 2012). This shows that there are barriers to collaborating horizontally in the municipalities, which however can be minimised through the use of networks in the planning process. This leads to the second research question concerning the characteristics of governance and networks in relation to Danish climate change adaptation planning and how this is affected by institutions.

The theoretical part of the thesis dealt with the second sub-research question. Through the first chapter of the theory, the shift from government to governance was presented. The governing system in Denmark and other Western European countries has changed from being based on expert knowledge characterised by sector silos and iron cages within the public administration, aiming to implement political goals in the most efficient way possible, to what is popularly referred to as governance. The literature review showed that there are several uses of the term governance. In general however, governance is characterised by including a range of actors/organisations in networks in the planning process to gain a broad and common knowledge on a given subject. These actors/organisations are interdependent of each other and participate in interactions through negotiations and the exchange of resources (Rhodes, 1996). The Danish climate

adaptation planning should take place within a governing system characterised by governance. However, the literature review showed that institutions constrain the frame in which organisations work. Through Scott's three institutional pillars: the regulative; the cultural-cognitive; and the normative, it was established that different types of institutional mechanisms can contain the organisations.

The findings of the theoretical literature review and the state of the art (chapters 6 and 2), were used to create an analytical framework. The analytical framework provided the initial basis to the analysis of the empirical data. Through interviewing six municipalities, three sewer utility companies and a regional authority, data was gathered to answer sub-research question three and four. The third sub-research question concerned the current status of the climate change adaptation process. This analysis showed that only one municipality had prepared a climate change adaptation plan, while the others were still in the initial phases. Furthermore, the analysis focused on the status of horizontal collaboration between the sewer utility companies and the municipalities and across sectors and municipal borders. The analysis revealed that all municipalities work with the sewer utility companies in undertaking climate change adaptation planning due to regulative mechanisms. The characteristics of this collaboration differing results; in some cases, the collaboration was natural to both parties, while some sewer utilities perceived the collaboration to be a matter of the municipalities ordering services from the sewer utility, who were then expected to deliver and pay for the services. The regulations in the area, including the privatisation of the sewer utility companies, thus act as both an institutional barrier and motivational force to collaboration. The analysis also showed, that only one municipality worked with other administrations within the municipality. This illustrates that, the municipalities work in sector silos. In terms of collaborating with other municipalities on climate change adaptation planning the analysis showed that none of the interviewed municipalities were working together to solve common issues at the present time.

The other analysis focused on the fourth sub-research question concerning the institutional barriers and motivating forces to horizontal collaboration. The analysis showed that there are several regulative, cultural-cognitive and normative barriers to horizontal collaboration. Along with the motivational forces, these are listed in. The regulative focused on the privatisation of the sewer utility companies and the contrasting aims between CCAP and existing sector plans. The normative barriers were characterised by a constraining perception of the need to collaborate among municipal politicians and officials. The cultural-cognitive barriers centred around the fact, that a culture to undertake CCA is currently merely emerging within the municipalities, resulting in confusion and a lack of attention to horizontal collaboration. Furthermore, time constraints and staggered planning processes also act as cultural-cognitive barriers. In terms of motivational forces, the requirements to undertake CCAP and a potential integration of CCA in the river basin plans acted as motivational forces. The normative motivational forces were characterised by a need to create political awareness, which could result in more resources being provided to undertake CCAP in collaboration with other municipalities. The analysis also showed that the officials do believe there is a need to collaborate where necessary, though some stated that their municipality did not need to collaborate.

The discussion following the analysis synthesised the findings of the analysis and revealed that imposing horizontal collaboration upon the municipalities through regulations is in contrast with the idea of the Danish planning system and that there is a need for normative and cultural changes within the municipalities. The normative changes should primarily happen at the political level, where attention needs to be given to the

complex issue of climate change adaptation. The cultural changes should primarily happen at the administrative level, as the officials adapt climate change adaptation planning to their current culture, rather than adapting their current culture to climate change adaptation. Furthermore, it is recommended that a platform is created, possibly at the regional level, to ensure horizontal collaboration. With these cultural and normative changes as well as the establishment of a platform, one could hope that waters will be without borders.

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