

Abstract

Municipal strategies for climate change are moving beyond mitigation and beginning to highlight adaptation as well. Yet, finding adequate solutions to tackle the emerging risks posed by climate change involves conflicting objectives for decision-makers and planners. Therefore, there is a need for collective action on multiple levels and between several sectors.

The following study is an exploratory, single case study that was conducted with the intention of mapping out and describing the factors and underlying mechanisms that can either reinforce or hinder cross-sectoral collaboration in climate change adaptation. The case municipality is one of Norway's largest cities and represents a typical case. The main findings suggest concrete measures to improve the collaborative process itself, e.g. channel more resources to the coordination efforts. The findings also highlight the importance of acknowledging the practical implications of the missing holistic interface between climate change mitigation and adaptation.

Sammendrag

Selv om kommunale klimastrategier la størst vekt på reduksjon av klimagassutslipp, viser det seg at klimatilpasning også ble trukket frem som en viktig faktor. Prosessen for å finne godetilnærminger for å takle den fremvoksende risikoen knyttet til klimaendringene innebærer målkonflikter for både beslutningstakere og planleggere. Derfor er det behov til samhandling på flere organisatoriske nivåer og mellom flere sektorer.

Denne studien er en utforskende case-studie. Hensikten er å kartlegge hvilke faktorer og underliggende mekanismer som enten kan styrke eller hindre tverrsektorielt samarbeid i klimatilpasning. Case-studien utforsker en av de største byene i Norge som representerer et typisk case. En av de viktigste funnene er et forslag til et konkret tiltak for å forbedre selve samarbeidsprosessen: Å gi mer ressurser til samhandling. Funnene fremhever også at det er viktig å anerkjenne praktiske implikasjoner av manglende helhetlige strategier som ser på forholdet/grensesnittet mellom utslippsreduksjon og klimatilpasning.

Preface

This thesis has written during the final semester of the Master's Degree Programme in Health, Safety and Environment, in the Department of Industrial Economics and Technology Management, at the Norwegian University of Science and Technology.

The literature references are cited according to the APA style (author, date) within the text, with a full bibliography found at the end of the report. All the interviews were conducted in Norwegian. All the translations have been undertaken by the author, therefore any errors and omissions are entirely my own.

I would like to extend a heartfelt thanks to my supervisor, Stian Antonsen, who has unfailingly provided constructive and incisive feedback and suggestions for improvement without which this thesis would have suffered greatly. He has not only been a great advisor during the thesis development, but has also been an inspiring teacher throughout my master studies in Safety Management. I am also grateful to all my closest friends here in Norway and in my home country of Finland, who gave me much-needed support along the way.

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1. Introduction

Climate change is inevitable and it is clear that we have to find strategies to cope with the changing climate as well as the risks and threats it poses. Even though traditionally the focus has been on climate change mitigation measures, we have to move beyond that and begin to encompass climate change adaptation as well. This is a process characterized by uncertainty. Even though we have been able to cope with the past and current variability of the climate, it is not certain that we will be able to cope with an unpredictable future climate. Hence, it is not enough to deal with today's climate in a reactive manner – planners and decision makers have to proactively address the future climate as well. This involves conflicting objectives for decision-makers and planners – a tradeoff between short-term efficiency and effectiveness on the one side, and long-term adaptation to uncertain future scenarios on the other. Furthermore, since both climate change mitigation and adaptation are complex issues touching many disciplines and sectors, the risks climate change poses require both concerted action from a wide variety of stakeholders and collaboration across sectors. Within this study cross-sectoral collaboration is understood as collective actions or practices by several municipal sectors working together towards a common goal.

This is an exploratory case study of climate change adaptation at a local level. The starting point for this study is the overall problem statement that shines light on the following question: How is climate change adaptation dealt with on a municipal level and across sectors? The main emphasis is looking at the ways different municipal sectors are currently collaborating, and on how climate change adaptation is integrated into overall municipal strategies. This will be done by looking at the factors that can either reinforce or hinder the cross-sectoral collaboration in climate change adaptation. The case municipality is one of the largest Norwegian cities that has relatively recently established a cross-sectoral working group for climate change adaptation. Even though coordination, i.e. management, efforts play a crucial part of the cross-sectoral collaboration, this study emphasizes collaboration and sees coordination as an important ingredient of successful collaborations. As climate change adaptation is ultimately put in practice through risk assessments and adaptive measures on a local level, the focus will be on this “lowest possible level.” This study looks at the collaborative processes within the established working group. To get the context right, the study will also offer a brief description of framework conditions for climate change adaptation originating at the national and county levels, with the focus on legislation and regulations that guide the municipal level. Thus, this study offers a snapshot of different success factors, challenges, and improvement potential in collaboration efforts with wicked problems¹ such as climate change adaptation.

¹ Wicked problems are problems that are challenging or impossible to solve because of requirements that are oftentimes difficult to recognize, and that are incomplete and contradictory. (Rittel & Webber, 1973) Section 4.2.1 gives more detailed description of the notion wicked problem.

1.1 Background and significance of the study

Norway is characterized by a highly varied geography and geology. Climate change involving sea-level rise and a higher frequency of hurricanes, extreme precipitation, stronger winds, flash floods, and drought can have very different consequences in different regions of Norway. Norwegian society will thus need to develop a wide variety of climate change adaptation strategies tailored to the characteristics of the different regions. Norway is also a country with long distances. This involves increased climate change related risk to critical infrastructures as power lines and telecommunication infrastructures are located in exposed areas, at the same time, as the level of infrastructure redundancy is low in remote communities.

As with all the densely populated areas in Norway, also the case municipality is facing risks posed by climate change. The case municipality is currently working towards its first climate change adaptation plan and has a goal of being climate resilient by 2030. This presents an opportunity to conduct a practice-based study looking at factors that are either hindering or reinforcing the work with climate change adaptation. As already mentioned, the focus is on cross-sectoral collaboration.

Why study collaboration with climate change adaptation at a municipal level?

The risks posed by climate change are closely related to societal safety as changes in weather patterns can affect several sectors and critical infrastructures. Therefore, highlighting climate change adaptation is also important when we are talking about societal safety. In this thesis the notion societal safety is defined as *“the society’s ability to protect itself against, and manage, incidents that threaten core values and functions and that put lives and health in danger. Such incidents may be caused by nature, by technical or human error, or by intentional acts”* (Norwegian Ministry of Justice and Public Security, 2017) In Norway, the work within societal safety is based on the four principles of similarity, proximity, responsibility, and collaboration, and all of these principles can be also applied to climate change adaptation. (DSB, 2018) All four of these principles for societal safety will be discussed in more detail in section 3.1.1. The principle of *collaboration* is the latest one and is also the central notion of this thesis. Therefore, it is important to highlight this principle here. This guiding principle of collaboration in the Norwegian emergency preparedness is to ensure that different actors, e.g. authorities, organizations, and agencies have a responsibility to *“[...] ensure the best possible collaboration with relevant actors and organizations in its work on prevention, emergency, preparedness and crisis management”* (DSB, 2018, p. 13). This principle of *collaboration* can be also applied to work towards (pre)handling emerging risks associated with climate change. As will be revealed later, the collaboration should take place at the municipal level as this is also the lowest governmental level.

1.2 Problem formulation and research questions

This qualitative, exploratory study sheds light on cross-sectoral collaboration in climate change adaptation on a municipal level. As it seems to be today, the political focus emphasizes climate change mitigation and there are currently numerous efforts put to different climate change mitigation measures. Nevertheless, even though not explicitly addressed in Norwegian legislation, we have to start to set better focus on climate change adaptation as well. Therefore, I am curious to explore how do current municipal practices mirror this problem, and especially how is the problem faced across different sectors. As the study will also show, with emerging risks such as climate change, collaboration is necessary in order to fully address and cope with the impacts of climate change. This offers a great opportunity for a practice-based research project that sees different factors and underlying conditions that influence the cross-sectoral collaboration process in climate change adaptation. The following research questions help to open up the study more:

RQ1: What characterizes existing strategies and approaches to climate change adaptation in the case municipality?

To frame the problem and get the context right, it is important to see the current situation in the case municipality when it comes to work towards climate change adaptation. As the current strategies are influenced by different governmental levels, the findings are also touching the underlying conditions and mechanisms that affect the municipal strategies and approaches.

RQ2: What are the factors hindering or reinforcing cross-sectoral collaboration in climate change adaptation?

There are different factors that can either hinder or reinforce the collaboration between different municipal sectors in climate change adaptation. These factors can be either directly related to the collaboration process itself, or indirectly influenced by framework conditions set at the higher levels of governance. By answering this research question, the study will get insights from deeper reasons for different mechanisms that should be in place in order to effectively respond to the risks climate change poses. Interviews will be the core method of getting insights from the case municipality's climate change adaptation group. The findings from the interviews are then mirrored against relevant theories to this typical case.

RQ3: What can be done to improve cross-sectoral collaboration in climate change adaptation?

The aim of this research question is to investigate what it takes to turn climate change adaptation into a more salient issue among different municipal sectors and to especially enhance the cross-sectoral collaboration between these sectors. As with the previous research question, the interviews are also used to get a grasp of the different meanings and improvement potential of cross-sectoral collaboration process in the case municipality.

1.3 Main findings

- The establishment of the cross-sectoral working group is an excellent example of how emerging risks stemming from climate change should potentially be handled: at the lowest possible governmental level, i.e. at the municipality, and collectively, i.e. across municipal sectors. The case municipality's approach mirrors well the two Norwegian principles of societal safety: proximity and collaboration.
- One of the case municipality's climate change adaptation strategies is to collaborate with relevant partners. Yet, the current practices emphasise the collaboration between different municipal sectors, leaving out external actors such as the power companies that own the power grid. Thus, the municipality is seen more as an organization, not as a geographic area. One of the explanatory factors for this is that the cross-sectoral working group is still in its infancy. Moreover, the apparent lack of resources has an effect on this. As a direct result of this, the climate change adaptation plan also emphasizes municipal sectors, leaving out the external stakeholders.
- One of the concrete measures to improve cross-sectoral collaboration is to channel more resources to the coordinating efforts. The current coordinator is the only one working full-time with climate change adaptation at the Environmental Unit. It is recommended to have two coordinators that can work as a team. This could strengthen the cross-sectoral working group as one of the coordinators could set the focus on managing the group and improving the group processes, whereas the other one could focus on external networks.
- Currently, there is a lack of a holistic approach that would also take into account the interface between climate change mitigation and adaptation. This has practical implications to the case municipality as the emphasis on mitigation measures, e.g. urban densification, can in some cases complicate the adaptation efforts due to inadequate sewerage systems, i.e. lack of storm-water management. Yet, the case study findings showed that in some cases the lack of holistic strategy can work as a powerful incentive to participate in the cross-sectoral working group in climate change adaptation. A prerequisite for this is that the participants realize the interdependencies between mitigation and adaptation measures
- The role of engaged officials is fundamental for bringing climate change adaptation higher up on the municipal agenda. This is a typical case in municipalities that still have not experienced extreme weather events that could force the decision-makers to set more emphasis on climate change adaptation.

1.4 Structure of the thesis

The report is structured into seven chapters from the introduction and theoretical reflections and suggestions to further work. Research design and methodological considerations are presented in Chapter 2. The main aim of the chapter is to make clear for the reader the strategies used for coming up with the research questions, i.e. aim of the study, together with explanation of the methods. The most important method for opening up the case study are expert interviews, which are explained in detail. Furthermore, the chapter explains the delimitations of the study and briefly describes the ethics of the research.

In order to better understand the Norwegian context, Chapter 3 offers a brief description of the framework conditions i.e. relevant regulations and policies starting from a national level. Since coordination of risk assessment and adaptation measures also takes place on the county level, the chapter also looks at this. As the main focus of this thesis is on municipal practices, the main emphasis of this chapter is put on this level, thus giving the reader a good overview of the relevant contextual factors.

Literature review in Chapter 4 offers theoretical lenses through which the case study is ultimately being analyzed. The chapter starts by briefly introducing a common way to conceptualize the risk management process. This rather normative model works in contrast to the approach this thesis is positioned in. The main approach of this thesis is thus based on the importance of collective action in decisions with different conflicting objectives in different governmental levels. As the case itself is placed in Norway, this chapter also briefly looks into earlier studies related to societal safety and challenges in cross-sectoral collaboration. The main emphasis of this chapter is to describe a model for collaborative governance that helps to conceptualize and analyze the findings from the case study itself.

Chapter 5 presents a qualitative study of the way climate change adaptation is dealt with real-life trade-offs in the case municipality. The main method are semi-structured interviews aiming to generate rich descriptions of the local practices of climate change adaptation and especially collaborative efforts. This chapter will provide the empirical basis to answer the research questions in chapter 6.

Discussion in chapter 6 draws together the findings from the case study and discusses these findings through the theoretical lenses presented in the literature review in chapter 4. All three research questions are answered in this chapter.

Chapter 7 offers concluding remarks. Here reflections for the work and suggestions for further work are also described. Finally, the Appendix contains the interview guide (Appendix A) and a synthesis of the theoretical knowledge and findings from the case study in a tabular form (Appendix B).

2 Methodology

This study was an exploratory, qualitative, single case study, with primary data gathered from interviews. This chapter is divided into three sections. Section 2.1 addresses the theoretical considerations of case study research methods, including issues of validity, reliability, and generalization and applies these to the study. Section 2.2 describes the applied methods used to conduct this study, the way the data was analyzed, and the limitations of the study. Finally, the ethics of the research are described in Section 2.3.

2.1 The Case study as a research method

The reason for doing case studies is to understand complex social phenomena and to expand and generalize from theories. (Yin, 2009) This study was conducted as a single case study. The chosen rationale was a typical case. In order to argue for the chosen case study design and rationale, more detailed descriptions of the theoretical considerations are in order.

There are two different kinds of case study designs to choose from: single and multiple case study designs. According to Yin, there are five different types of single-case studies: the typical case, the critical case, the extreme case, the revelatory case, and the longitudinal case. (Yin, 2009) A typical case, or a representative case, is the one that epitomizes a typical situation and the characteristics of these cases can also be found widely across any given range, such as institutions. A critical case is one where the researcher wants to test a well-formulated theory to see whether the propositions hold water. An extreme case, also known as a unique case, is used when the researcher wants to go deeper into a rare situation where the chosen case seems to be an "exception to the rule." A revelatory case can be used when the researcher wants to obtain new information from a case that has been previously inaccessible to research inquiry. A longitudinal case would follow the same case over a certain time period to explore the possible changes. (Yin, 2009) The single-case design, as is the case in this thesis, is appropriate when the focus is on one of these rationales.

The disadvantage of a single-case study is that the case might turn to be something else than was originally thought. To avoid this, a multiple case study can be chosen instead. According to Yin (2009) the strengths of a multiple case study is that most often the conclusions drawn from the case analysis are more robust since both the validity and reliability² of the data are stronger in multiple case studies compared to single case studies. Even though choosing multiple case study increases the external validity and reliability, I would agree with Flyvbjerg (2006, p. 228) when he states that "[...] one can often generalize on the basis of a single case, and the case study may be central to the scientific development via generalization as

² See Section 2.2.3 for definition of validity, reliability and generalization

supplement or alternative to other methods. But formal generalization is overvalued as a source of scientific development, whereas the “force of example” is underestimated.”

To increase the generalization, emphasis was put on the case selection. I would argue that the chosen case, one Norwegian municipality, represents a typical case. As the case municipality has relatively recently established a cross-sectoral working group for climate change adaptation, I am curious to know how this working group functions in practice. This study offers a snapshot of what represents the “struggles” of moving from vertical governance structures with sectoral silos to more horizontal networks and collaborating across these sectors, or sectoral silos. Furthermore, as collaboration in such salient, but still emerging issues such as climate change seems to be a rather challenging task, this case provides a suitable context for answering the research questions. Therefore, I argue that the case municipality could be seen as what Flyvbjerg (2006, p. 228) referred to as “*the force of example*” and the findings of the study could be generalized to other cases.

2.2 Qualitative methods

Qualitative research can be defined as a research strategy that sets the focus on words rather than quantifiable data when collecting and analyzing the data. (Bryman, 2008) The nature of this qualitative study is iterative, meaning that even though certain initial theoretical considerations guide the case study, the theory is open to possible re-configurations when new findings about the case are being explored. Thus, the findings from the case study shape the literature review and ultimately sharpen the research questions. This is also a strength of an exploratory study: the researcher can adjust the literature review when new information and new discoveries come up. (Bryman, 2008)

2.2.1 Literature review

The aim of the literature review is to help to frame and sharpen the problem formulation before starting to collect the case study evidence. The initial literature review was conducted to help to make the interview guide and frame the case study. The following table elaborates the different research questions, theoretical knowledge and the main sources that help to frame and support the research questions.

Table 1 Summary of the most central sources used in the literature review

| Research question | Theoretical knowledge | Key Sources supporting research questions |
|---|--|--|
| RQ1: What characterizes existing strategies and approaches to climate change adaptation? | The current status of national climate change strategies Municipal strategies for climate change adaptation | Key national laws and regulations, such as Planning and Building Act and Civil Protection Act (Det Kongelige Miljøverndepartement, 2012) (DSB, 2015a) (DSB, 2015b) |
| RQ2: What are the factors hindering or reinforcing cross-sectoral collaboration in climate change adaptation? | Model for collaborative governance Norwegian studies on cross-sectoral collaboration Information perspective | (Ansell & Gash, 2007) (Almklov, Antonsen, Bye, & Øren, 2017) (Turner & Pidgeon, 1997) (Rasmussen, 1997) |
| RQ3: What can be done to improve cross-sectoral collaboration in climate change adaptation? | What factors influence the cross-sectoral collaboration/ coordination on a municipal level? | (Ansell & Gash, 2007) (Ostrom, 2010) |
| | What organizational factors influence the collaborations? | (Rasmussen, 1997) (Ansell & Gash, 2007) |

2.2.2 Interviews

Interviews were the main methods used to understand how the different municipal sectors collaborate in climate change adaptation, and to find out the hindering and reinforcing factors that can affect this cross-sectoral collaboration. According to Yin (2009), compared to other research methods the strength of choosing interviews lays in their capability of focusing exactly on the case study topics. Furthermore, interviews are valuable to gain insights of the phenomena that are often not graspable by other means. Yet another strength of conducting

interviews is that the interviewees can provide short-cuts to valuable information, such as specific key documents that would have been otherwise overlooked by the researcher. (Yin, 2009) Interviews are also capable of reflecting the struggles, dissensions and other forms of distortions in collaborative efforts that are not possible to grasp from a written material.

According to Robson (2002), there are three different kinds of interviews: structured, semi-structured, and unstructured interviews. Structured interviews can also come in the form of closed or open-ended questions. Closed questions are the ones found on questionnaires, whereas open-ended ones give more space for expression from an interviewee. In this study, semi-structured open-ended interviews were used. The advantage of these kind of interviews is that even though the interview itself follows the interview guide, it should act more like a guided conversation than a rigidly structured query, allowing for new insights that might not have appeared if the interview guide had been followed by the book.

Conducting interviews – choosing informants and making interview guide

In this study, expert interviews were used to gather data about the topic. According to Mikkelsen (1995), key individuals have particular knowledge about the issues under investigation. This applied to the chosen interviewees as they are or have been deeply involved in the working group for climate change adaptation in the case municipality.

The case municipality has relatively recently established a cross-sectoral working group that could be seen as a core group for climate change adaptation at the municipal level. The informants, i.e. key individuals, have different professional background and they have represented different municipal units or sectors. All of the informants have been or currently are part of the working group for climate change adaptation. Currently there are five different municipal units involved in the cross-sectoral working group: Municipal Engineers (Kommunalteknikk), Urban Planning Office (Byplan), the Map and Survey unit (Kart og Oppmåling), Building Applications (Byggesak), and Real Estate (Eiendom). Representatives from four out of five of these sectors were interviewed. The Real Estate was the only unit that was not interviewed due to difficulties of reaching the representative. In addition, the climate change adaptation coordinator (henceforth referred to as coordinator) for the case municipality was interviewed. The coordinator is working for the municipal Environmental Unit (Miljøenheten) and, according to herself, is the only person working on climate change adaptation in her corresponding unit.

The interviews were conducted to gather information of the group dynamics and possible reasons that can either hinder climate change adaptation in different sectors or elements and mechanisms that should be in place to enforce it. As it became apparent, the case municipality with its cross-sectoral working group [for climate change adaptation] is currently working towards its first climate change adaptation plan.

Part of the collected data is presented with quotes to give the reader a clearer impression of the different meanings and viewpoints. All of the interviews were conducted in Norwegian, yet quoted parts were translated into English. Interview guide (Appendix A) was formulated in a way that helped the researcher to answer the research questions. All of the interviews were conducted face-to-face in sessions varying from 30 minutes to 1,5 hours. The interview transcripts were coded accordingly.

Analyzing the interviews

The analysis of the data retrieved from the interview transcripts was based on the framework found in grounded theory. In practice, this means that the data I got from the interviews influenced the theories used to analyze the data. (Bryman, 2008) Using this kind of well-structured and iterative case study approach ensures that only relevant data is being used in the analysis of the topic. (Bryman, 2008)

To produce a high-quality analysis, it is necessary to structure and code the data from interviews first. All of the transcripts were carefully read through one by one, and then broken down into different key elements. All of these different elements were then grouped into categories. This was done by classifying data into different categories based on the research questions and the interview guide. Even though the vantage point for different categories was set beforehand, since the interviews were semi-structured, there were also new categories that came up while coding the interviews. The key elements from each of the interviews were set into categories and under-categories that reflected but were not limited to the research questions. This kind of coding is called open-coding and is based on grounded theory. (Bryman, 2008)

The following categories give the reader a sufficient understanding on how the data retrieved from the interviews was analyzed:

- The underlying mechanisms that influence the integration of climate change adaptation into municipal planning processes
- The immediate factors and underlying mechanisms influencing coordination efforts at the municipal level
- The immediate factors and underlying mechanisms that influence the collaboration process of the working group and efforts between different municipal units
- The offered suggestions for improving the cross-sectoral collaboration process
- The offered suggestions for better integrating climate change adaptation into municipal agenda

The table in Appendix B draws together the theoretical considerations and case study evidence. The table is utilized when answering the research questions in chapter 6.

2.2.3 Understanding validity, reliability, and generalization

The quality of the research design can be judged by the three research design tests drawn from Yin (2009). They are construct validity, external validity, and reliability. In the following, each of these are explained and on how they were taken into account in this study.

Construct validity focuses on identifying the correct measures that represent the concepts being studied. Increasing the construct validity happens primarily during the data collection phase by using multiple sources of evidence and by establishing a chain of evidence. As has already become evident, in this study interviews were the most important source of evidence and different documents are only used as background information. The strengths of only using one source of evidence lays in the nature of this exploratory study, that of discovering the improvement potential to the cross-sectoral collaboration in practice. As I have interviewed several working group members who all see the collaborative process from their perspective, this strengthens the construct validity. Therefore, even though I have acknowledged the biases of not using document analysis I decided against them and chose to set the focus on interviews. Making an extensive document analysis was also not possible since in order to anonymize the interviewees, it was decided to anonymize the case municipality.

External validity is the degree to which the findings from the case study can be generalized to other cases. Critics typically state that single case studies offer an especially poor basis for generalization. (Yin, 2009) Again, as pointed out earlier, this is a common misunderstanding in case-study research and single case studies can, in addition to linking the findings to theories, serve as a base for generalization with a prerequisite that the case is carefully selected. (Flyvbjerg, 2006) The chosen Norwegian municipality represents a typical case. Therefore, I would argue that external validity is strong in this study.

Reliability is established by ensuring that the study can, at least in principle, be repeated with similar findings. In practice this means that another researcher should end up with similar conclusions by following the same methods and procedures and using the same data from the case study. To increase the reliability, it is important to pay attention to the transparency of the research. Therefore, the various steps taken during the study should be carefully documented to allow another researcher to access both documentation [interview guide] and the processes by which the data was collected and analyzed.

2.2.4 Delimitations and considerations

I chose against systematic document review. Even though systematic document review could have given me a better picture on how risks associated with climate change are integrated into different plans and sectors, I have decided not to do an extensive document analysis. As such, interviews are a better method to gain insights into the case itself, which is not possible to grasp from written material. Yet, documents were not totally overlooked since I used them

to get an overall picture of the Norwegian context that also affect the local, or municipal, practices. As will be brought up again, the aim of this explorative study is not to test the relevance of all the existing theories, but rather the focus is set to the empirical part. Therefore, certain scholars, even though relevant for the study, are only used to enrich the literature review.

The chosen theme, climate change, is not value-neutral. As a municipality is a political system, it depends on the political decisions where the focus is. As it is at the moment, the case municipality has more focus on climate change mitigation than in adaptation. This seems to be a typical situation in many of the Norwegian municipalities and stems from the national-level priorities setting emphasis on climate change mitigation, as will be further elaborated in Chapter 3. The emphasis on climate change mitigation over adaptation stems from different factors and public pressure influencing the national policies. The current national policies emphasizing climate change mitigation thus strengthens my view of the chosen municipality being a typical case.

Even though the municipal sector is an important actor working with issues related to climate change adaptation, it is not, and should not, be the only organization to focus on the effects of the changing climate. For instance, the energy companies that own the energy grid are very vulnerable to climate change. These non-municipal actors and sectors are nevertheless left out from this study, as are the market organizations and other non-state actors. Thus, this study sets the focus only on specific sectors at the municipal level. The reason for this is the nature of this study: to look at the collaborative process within one Norwegian municipality.

I furthermore acknowledge that having more empirical evidence, i.e. more interviews would have strengthened the analysis and given me more insights to the challenges faced by the cross-sectoral working group and the coordination efforts. As it became apparent during the interviews, the composition of the cross-sectoral working group has been changing over time. Furthermore, the interviews are limited to this *horizontal* working group, leaving out for instance the municipal management group. Yet, as this study offers a snapshot of *the current* situation, or a situation in a given time, and as this is not a longitudinal study, I strongly believe that the chosen approach is sufficient and offers a good basis for further studies.

2.3 Ethics in research

Ethical considerations should form an integral part of every qualitative research. In this study confidentiality and transparency are the most important principles in assessing the ethics of this study. (Bryman, 2008)

The first area of ethical concern relates to privacy, i.e. confidentiality. As there is only one cross-sectoral working group in the case municipality, to ensure the anonymization of the interview objects, it was necessary to anonymize the case municipality. Taking into account

both the nature of the study, i.e. the fact that the case municipality represents a typical case; and that the main research methods are interviews, not for instance key municipal documents, this was not considered problematic in the data analysis phase. As a typical case, the case municipality could, at least in theory, be almost any Norwegian municipality. Therefore, even though anonymous case studies are not ideal, they can still provide added value to understand the cross-sectoral collaboration in practice. As the number of interviews were limited to five, some of the cited quotes were also anonymized in order to further protect the interview subjects.

No social study can be truly transparent, but is always influenced by the researcher's own presumptions, world-views, and values. This was also the case in this research as my own conscious and unconscious biases affected both the interview process, the ways I conducted the literature review, and how I both saw and analyzed the case study evidence. To minimize the effect of these biases, the close cooperation with my supervisor Stian Antonsen was maintained throughout the project period. Apart from increasing the transparency and reliability of this study, the repeated and sustained exposure to peer review together with the constructive criticism and suggestions for improvements helped me to set the findings to a wider perspective.

3 The Norwegian Governance System

The aim of this chapter is to describe the multilevel governance in Norway and thus help the reader to better understand the context relevant for this thesis. The Norwegian governance system can be divided into national government, county governor at the regional level, and municipalities at the local level. Section 3.1 describes the framework conditions for societal safety and climate change adaptation originating from the national level. Relevant national legislation is also shortly touched upon. Section 3.2 focuses on the county level where important coordination of risk assessments and climate change adaptation processes takes place. Section 3.3 sheds light on the municipal level where adaptation measures are ultimately put into practice. Since the focus of this study is on cross-sectoral collaboration on climate change adaptation at the municipal level, the emphasis of this chapter is on that governmental level.

3.1 National level

To draw a holistic picture of the local government activities towards societal safety and climate change related issues, it is first necessary to look at the framework conditions originating from the national level. These framework conditions, including laws and regulations, formulate the basis in which Norwegian municipalities are guided. As it is in Norway, the national adaptation strategy (white paper) on climate change adaptation determines that “[...] everyone has a responsibility to adapt to the climate change, both individuals, businesses and authorities” and that “[...] the local characteristics of climate change places municipalities into forefront with the climate change” (Det Kongelige Miljøverndepartement, 2012, pp. 35, 62)

3.1.1 The four principles of societal safety

As already revealed in Section 1.1, in Norway, the work with societal safety is based on the four main principles of similarity, proximity, responsibility, and collaboration. The overall aim of these four principles is to clarify the role of different actors and sectors to not only maintain, but also to develop the resilient societal functions such as functioning of certain critical infrastructures. In the following, each of the principles are elaborated based on information gained from the Norwegian Directorate for Civil Protection. (DSB, 2018)

Similarity: This principle ensures that the municipality’s organization should, as far as possible, be kept as similar in a crisis as in a normal situation. This ensures efficient experience and knowledge transfer between normal and crisis situations. (DSB, 2018, p. 13)

Proximity: The people, organizations or as is the case in this thesis, different municipal sectors, that are situated closest to the crises, usually have the best capability to understand

the problems involved and therefore also handle the crises. This principle emphasizes that the crises should always be handled in the lowest possible organizational level. This proximity principle coincides with the principle of responsibility and means that since all the crises happen in a municipality, it is the municipality that should also handle the crises. (DSB, 2018, p. 13)

Responsibility: This principle clarifies that the organization, agency, or authority who normally has the responsibility of the field, should also have responsibility in the crisis. In practice, and in relation to this thesis, this means that every municipal sector is responsible or “owns” the risks in their corresponding sector. (DSB, 2018, p. 13)

Collaboration: As climate change related risks touch different sectors, all the actors have a responsibility to collaborate across the sectors. In practice this principle means that all organizations should be aware of the interdependencies between different sectors and ensure the best possible collaboration with the relevant actors and sectors. This applies to crisis prevention, preparedness, and crisis management. (DSB, 2018, p. 13) As already mentioned in section 1.1, this principle of collaboration is also the newest principle.

All of the above-mentioned principles can be seen in the light of climate change adaptation. As climate change touches many sectors and should ultimately be handled across different sectors, the collaboration principle is the central principle in this thesis. The need for effective collaboration has also been emphasized in the national white paper on climate change adaptation that sees the need to “*stimulate collaboration, information and knowledge creation.*” (Det Kongelige Miljøverndepartement, 2012, p. 37) Yet, as it is at the moment, the principles do not seem to explicitly clarify what is a sufficient level of collaboration. Furthermore, even though it is clear that coordination is important, especially with wicked problems that touch several disciplines and sectors, none of the principles explicitly highlight this.

Keeping these four principles in mind, it is interesting to see how different sectors collaborate in a so-called *normal situation* and what factors are either hindering or reinforcing the different collaboration efforts. As municipalities can be seen as a cornerstone for civil protection, municipal authorities should also take the coordinating role within contingency planning and climate change adaptation. Furthermore, as climate change related risks touch many sectors and areas in our society, e.g. water and wastewater, transport, areal planning, and energy production and distribution, ultimately also collaboration should occur between several sectors.

3.1.2 National expectations, laws, and regulations

A central instrument for Norwegian government is *National expectations to regional and municipal planning* that are renewed every fourth year. The overall aim is to promote

sustainable development and these national expectations are used as basis for the work for both county councils and municipalities. (Kommunal- og Moderniseringsdepartementet, 2015) Between 2015 and 2019 the overall focus has been on climate change mitigation, i.e. reductions of GHG emissions and energy-efficiency. In regards to climate change adaptation, the national expectations mention that *“sustainable land-use planning and community development”* and *“climate change, risk and vulnerability has to be taken into account through community- and land-use planning; and building regulations³”* (Kommunal- og Moderniseringsdepartementet, 2015, p. 17).

Currently there is no overall national strategy that would explicitly address both climate change mitigation and adaptation or the interface between these two notions. This is mirrored towards and affects the local level in different ways. As it is now, the national guidelines for climate- and energy planning set the focus on climate change mitigation. This is nevertheless changing as the new national guidelines valid from 2019 also include climate change adaptation. Yet, as this study offers *a snapshot from current situation*, as in 2018, the new national guidelines, even though worth mentioning, are left out of further investigation in this study.

Even though there is an absence of clear signals from the national level on climate change adaptation and how to handle the risk and vulnerabilities the changing climate will bring, there are two laws that provide the basis and framework for climate change adaptation and societal safety. The Planning and Building Act provides guidelines for land use planning, whereas the Civil Protection Act contributes to the recognition of the different risks by requiring the municipalities to conduct a comprehensive risk and vulnerability analysis (Miljødirektoratet, 2018). Although, the Planning and Building Act §3-1 does not specifically mention climate change adaptation but rather puts the emphasis on climate change mitigation, there are certain elements that relate to climate change adaptation. According to the Act municipalities shall *“promote social safety by preventing the risk of loss of life, damage to health, environment and important infrastructure, material values, etc.”* (Plan og Byggningsloven, 2018).

Risk- and vulnerability analysis (later on referred to as RVA analysis⁴) is a central element in Norwegian planning and building act §4-3 that sets requirements for the municipalities to implement regular RVA analysis. Together with other information, RVA analysis gives knowledge base for the assessments of different measures. (Miljødirektoratet, 2018; Plan og Byggningsloven, 2018) As it is at the moment, the Norwegian law does not specify climate change related risks but gives general guidance on how to assess the risks and vulnerabilities.

³ Byggesaksbehandling

⁴ ROS analysis

Civil Protection Act §14 requires the municipalities to identify unwanted events that may occur inside the municipality's geographical boundary, and furthermore to estimate potential vulnerabilities. This goes hand in hand with the Planning and Building Act's requirement on regular RVA analysis. In addition to these two central laws, there are several laws and regulations that have integrated climate change adaptation at some level, for instance building regulations, TEK10 (or TEK17) that sets requirements on building qualities.

3.2 County level

In Norway, the county governor (Fylkesmannen) is a regional representative of the national government at the county level. Furthermore, the county governor works as a mediator between municipalities and Norwegian Directorate for Civil Protection (later on referred as DSB). Regarding risk assessments, the county governor has a double role: they coordinate the risk assessments and climate change adaptation measures, offering support for the municipalities. In addition, the county governor contributes to collaboration and coordination between different municipalities. (DSB, 2018) The county governor furthermore has a formal mandate to conduct regional RVA analysis with one of the aims to provide guidance for municipal planning. (Dannevig & Aall, 2015)

The county governor is a link between national and local authorities and has an independent role as a supervisor for municipal authorities for the work on societal safety and preparedness. (DSB, 2018) As was already revealed in Section 3.1.2, there are no direct laws that specify climate change adaptation, but some aspects of it have been integrated to both the Civil Protection Act and to the Planning and Building Act. As a supervisory body, the county governor both gives guidance and helps the local authorities to maintain the targeted and systematic work within societal safety and preparedness. (Lovdata, 2015) The county governor shall moreover make sure and follow up that municipalities will follow the requirements of different national laws. (DSB, 2015b) Regarding climate change adaptation, it is especially the Planning and Building Act that is the governing document for both county governor and municipalities. (DSB, 2015a) The county governor furthermore shall give guidance on municipalities on how municipal authorities should follow the requirements of the Civil Protection Act. Moreover, the county governor shall take initiative of and follow up the evaluations on different measures regarding societal safety and other measures that can enhance the competencies of the municipality. (Lovdata, 2015) Furthermore, the county governors work with the regional RVA analysis, and as advisory bodies for municipalities for the risk assessments regarding the effects of climate change. Here, the county governors are mandated to include the potential effects of the changing climate to regional planning strategies, together with estimations the alternative long-term measures that give meaning for the development of the region as a whole. For estimating the both short-term and long-term effects of climate change to the region, the relevant knowledge base should be considered. (DSB, 2015a)

3.3 Municipal level

In Norway, municipalities represent the local governmental level and play an important role in implementing national policies. Therefore, municipalities could be seen as the state representative working closest with the public. While certain municipal services are regulated by the national legislation, there are only few national incentives for carrying out tasks not regulated by national laws. (DSB, 2015a)

All four of the previously presented principles of societal safety, see Section 3.1, are highly relevant for the municipal governmental level. The municipalities will be the lowest level of governance and thus also closest to crises that may occur. The same applies to measures towards climate change adaptation that should foremost be handled on this level, and within and between different municipal sectors. Therefore, municipalities can be seen as one of the most important cornerstones for climate change adaptation. These four principles [of societal safety] can be also applied to climate change adaptation. Since climate change related events will always happen within a municipality's boundaries (proximity), it is here the focus should be. The principles of proximity and similarity can be also mirrored to climate change adaptation: the municipal sectors should each have the responsibility of the corresponding sector what comes to climate change adaptation.

At the moment, there is no common formula on how to organize the work with climate change adaptation in Norwegian municipalities. This reflects the general "autonomy" of Norwegian municipalities that, in addition to climate change adaptation, have freedom to decide themselves on how to organize municipal planning. Thus, the national authorities and laws do not give the municipalities specific guidelines on the subject. Yet, as Norwegian municipalities are exposed to a variety of climate change related risk, giving the local governments and authorities more freedom to choose how to integrate climate change adaptation is justified.

Even though neither the Planning and Building Act nor the TEK 10 standard specifies climate change adaptation, DSB points out how the preparatory work for the law (Ot. Prp. Nr. 32 (2007-2008) describes the notice for the Planning and Building Act § 3-1 as: *"Letter g refers to the planning as an important instrument to take into account and counteract climate changes. Municipality shall ensure that residents are taken care off in extreme weather conditions. This is done through vulnerability analyses, when developing contingency plans, and in spatial plans (arealplaner) that ensure that vulnerable areas are not being build/developed. In addition, the consequences of sea-level rise shall be taken into account."* (DSB, 2015a, p. 12) As seen, sea-level rise is the only parameter related to climate change adaptation that is directly mentioned in the law. This is logical since sea-level rise affects all the coastal cities in Norway. Yet, it is important to realize that currently the law does not specify the time frame for the sea-level rise. In addition, the law sets the focus on extreme weather events, thus

dismissing the indicators for more gradual changes in climate such as increased precipitation and higher temperatures potentially leading to urban floods and droughts.

3.3.1 Municipal tools and planning instruments for climate change adaptation

There exist several means on how municipalities can better integrate climate change and climate change adaptation into their planning practices. Previously mentioned RVA-analysis is a central tool that sets the boundaries on where the focus should be. Other mentionable means are municipal master plan (kommuneplan) and zoning plan (reguleringsplan).

In Norwegian municipalities the municipal master plan is a governing document that provides a framework for both development and management of different areas and districts. As figure 1 illustrates, the masterplan consists of two central elements: the land use element (kommuneplans arealdel) and the societal element (kommuneplans samfunnsdel). The societal element of the master plan sets a focus to long-term development of the society as climate change influences many of the municipal functions. The land-use element sets the frames and terms for the future land-use of the municipality's area, thus focusing on infrastructure and facilities. The land use element is therefore a crucial element in regards to climate change adaptation. The aim of the zoning plan is to determine the details set in land-use elements of the master plan. Thus, both land-use elements in the masterplan and zoning plan are central means for climate change adaptation. It is important to realize that the master plan is only valid for new areas or for areas that are changing character, e.g. old industrial or harbor areas that are being turned into mix-used neighborhoods. The areas that are already built and exposed to climate change related risks cannot be influenced by the master plan. (Junker , 2017) (Fiskaa, 2011)

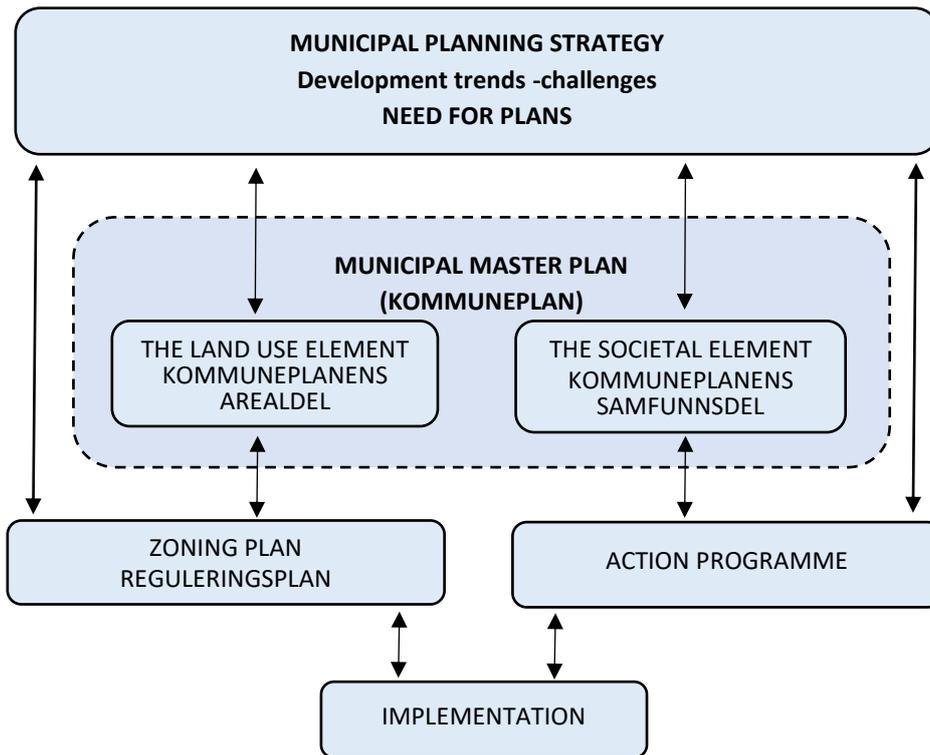


Figure 1. Overview of the municipal planning system (retrieved and translated from: Regjeringen, 2018)

This chapter offered an overview of some of the central notions, laws and other elements that are important to know in order to better understand the underlying conditions under which the Norwegian municipalities are working under.

4 Literature review

This chapter provides a review of the relevant literature within handling of emerging risks associated with climate change, importance of cross-sectoral collaboration in climate change adaptation, and exploration of potential direct factors and underlying conditions affecting collaboration. Since this study is an explorative study, the aim is not to test or demonstrate the relevance of the existing theories but rather to set the focus on the empirical part. Therefore, the focus is kept within the description of the existing theories starting with commonly-used normative models on handling emerging risks in Section 4.1. This is followed by an approach used in this study in Section 4.2, which is taking the cross-sectoral collaboration better into account. Section 4.3 discusses the current challenges in collaborating across boundaries within societal safety in Norway. Section 4.4 sets the focus on discussing the model of collaborative governance which is also central in this thesis. The model describes the variety of factors and mechanisms that affect and should be acknowledged in efforts to improve cross-sectoral collaboration. Finally, Section 4.5 summarizes this chapter.

4.1 Managing emerging systemic risks associated with climate change

Climate change related risks such as floods, storms, heat waves, heavy rain, landslides, and avalanches can be classified as emerging systemic risks that are “[...] at the intersection between natural events, economic, social and technological developments and policy-driven actions.” (IRGC, 2008, p. 4). Furthermore, emerging risks are usually characterized by high uncertainty and a lack of knowledge about potential impacts (IRGC, 2017). Yet, “[...] in some cases this knowledge may be contested among actors with different interests and viewpoints.” (Renn, 2014, p. 114). This strengthens an observation that sometimes more salient issues, with relatively short-term objectives and financial pressure, can be conflicting with the overall national objectives to safeguard the citizens and prevent the damage to the infrastructure. A concrete example is to build on areas exposed to long-term effects of climate change such as sea-level rise. As will be illustrated in the following subsection 4.1.1, these kinds of risks can also be seen as man-made disasters. Subsection 4.1.2 introduces a widely recognized model developed by International Risk Governance Council that helps to conceptualize the emerging systemic risks.

4.1.1 From emerging risks to man-made disasters

One of the most acknowledged emerging risks in Norway related to climate change is associated with increasing precipitation. (DSB, 2016) According to the recent climate projections, the probability for excess amounts of precipitation are very high in many Norwegian cities. (DSB, 2016) The core of the problem is that in many Norwegian cities the current sewerage systems are most-often based on combined sewers, i.e. the system is not separating the sewage water from the stormwater but uses the same infrastructure. Thus, during excess precipitation this can pose problems both to the sewerage system but also to the wastewater treatment plants that are working on their full capacity. (NOU, 2015) As

furthermore highlighted, this lack of capacity can have serious consequences to human health if contaminated water is discharged to the surface. (NOU, 2015)

This example from the Norwegian sewerage system can be mirrored against and seen through the lenses of man-made disasters that are characterized by root causes and immediate causation. (Turner & Pidgeon, 1997) Accordingly, man-made disasters are disasters whose existence is being acknowledged in a foresight but due to biases in information flow and misperceptions among decision-making, the accumulated effects can be sometimes left unnoticed due to certain culturally accepted norms. (Turner & Pidgeon, 1997) Going back to the example from Norway, as pointed out in the report of DSB (2016, p. 50): “[...] *there exist known and available measures [...] there are many decision-makers that are dependent on each other, and that have to collaborate with both prevention and preparedness. There exist effective preventive measures that are expensive and time-consuming to get in place [...].*” Sometimes the consequences can also be left without further notice because of a reluctance to fear the worse outcomes. (Turner & Pidgeon, 1997) This can stem from rather expensive measures to prevent or minimize the consequences. The decisions are thus characterized with, what Rasmussen (1997) calls, “*conflicting objectives.*” Even though there exist several known means to prevent and minimise the effects related to the vulnerabilities of the Norwegian sewerage system, measures such as installing storm water management systems and setting more emphasis on utilizing nature-based solutions⁵ such as blue-green infrastructure can be both costly and time-consuming. (NOU, 2015)

4.1.2 The risk governance process

To cope with the emerging risks associated with climate change, we need adequate models to structure the risk management process. The International Risk Governance Council (IRGC) has developed a framework that can be utilized both to understand and assess the emerging risks, see figure 2. (IRGC, 2008) Even though the framework is not developed specifically for risks posed by climate change but since it is rather a general framework, it could be also utilized and applied to emerging risks associated with climate change. These climate change related risks are often, as Renn (2014, p. 114) describes them, characterized with “*emerging interactions and systemic dependencies*”, as the previously described example from the Norwegian sewerage system also hinted towards. The IRGC framework can be used to both understand the risks and decide how to handle them. In the following, each of the phases of the framework are briefly discussed and as far as possible applied to climate change adaptation.

⁵ Nature-based solutions can be seen as measures that are ecosystem-based solutions that are used to both climate change mitigation and adaptation such as green and blue infrastructure. (European Commission, 2015)

IRGC's approach starts by generating and evaluating the knowledge about the risk with the overall aim to understand the risk we are dealing with. Managing the risk is an iterative process meaning that we should constantly move back and forth between different phases in the framework while sharpening our understanding of it and deciding on different management options to handle the risk. This iterative process is illustrated with

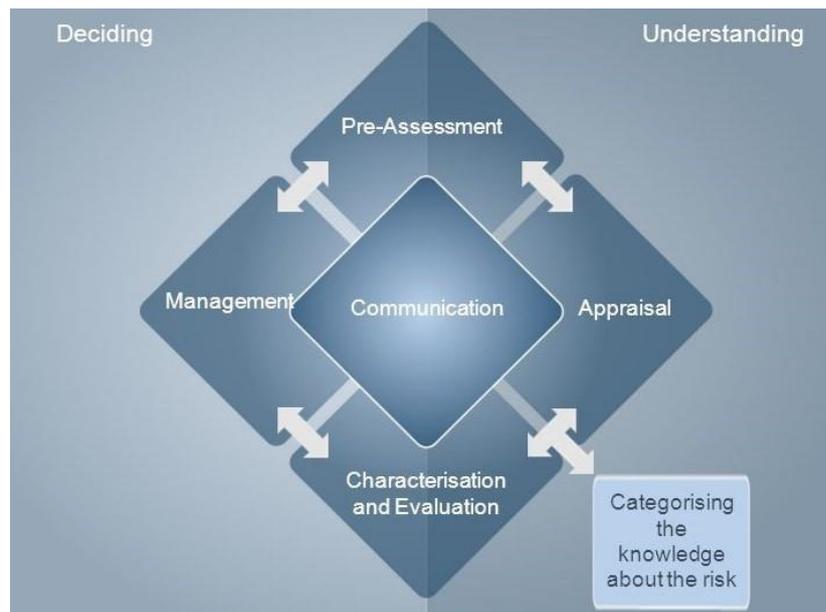


Figure 2 Risk Governance framework (IRGC, 2008)

double-headed arrows in the figure 2. The first part of the framework, that of understanding, can be furthermore divided into the following phases.

Pre-assessment defines the risk and frames the actual problem. It is in this phase where the early warning signs, i.e. indicators that there is already a problem should be assessed. In here, relevant stakeholders that can help to frame the risk should also be identified. The scope, i.e. boundaries of the risk that should be handled are furthermore defined in this phase. (IRGC, 2017) In their research on climate change adaptation in a local level in Norway, Dannevig, Hovelsrud & Husabø (2013) have identified specific aspects that should be in place in order to allow risks associated with climate change to be taken into consideration. They talk about real-world indicators that are "*observable and measurable signs of a problem such as minor floods, changes in weather patterns, ecosystem changes and changes in magnitude and frequency of weather events.*" (2013, p. 499). Extreme weather events, what Dannevig, Hovelsrud & Husabø (2013) refer to as "*focusing events,*" can also serve as such early warning signs that can help to acknowledge that there is already a problem. Looking at the local level, it is often the geographic boundaries of the municipality that define the boundaries of risk evaluation. Climate change touches many sectors and disciplines. Looking from a municipal perspective, it is crucial to define whether only municipal sectors are taken into account, or whether external stakeholders - such as energy companies, for instance - are considered.

The appraisal or assessment phase can be divided into two parts: risk assessment and concern assessment. The knowledge base for the problem and decision-making is developed in the risk assessment phase. Different options for preventing, mitigating, and adapting to the risk are assessed. Identifying both the source of the risk and the impacts of it to the society are done in the risk assessment phase. The likelihood and severity of the risk should be estimated.

Furthermore, the possible cascading effects of the risks, as the previously mentioned case of Norwegian sewerage system is an excellent example of, should also be taken into account in this phase. (IRGC, 2017) Lack of competence and knowledge about risks associated with climate change can create a pressure for prioritizing other tasks. Therefore, involvement of researchers that have enough of a knowledge base regarding the possible risk climate change can pose is also crucial. (IRGC, 2017) This observation from IRGC goes well together with Turner's notion of the importance of the information flow in safety management and with man-made disasters, as "[...] *there is nearly always someone who is aware of the immediate danger.*" (Rosness, et al., 2010, p. 75) Furthermore, findings from Dannevig, Hovelsrud & Husabø (2013) show that Norwegian municipalities that have been involved in research projects related to climate change adaptation, and who thus had better access to external expertise, were more likely, despite the lack of clear national guidelines, to add climate change adaptation higher in their municipal agenda. There are different ways to assess and evaluate the risk. In Norway, the previously mentioned risk and vulnerability assessments are commonly-used methods to assess the potential probabilities and consequences of the risk. Still, even though the climate change risk would be assessed, it will not necessarily lead to concrete actions for adaptation. (Dannevig, Rauken, & Hovelstad, 2012) An important, but often forgotten feature of the IRGC framework is concern assessment. Here, the values, public concerns, and other socio-emotional issues of climate change are assessed. (IRGC, 2017) The governance structures and national legislation play significant roles in determining the emphasis of climate change adaptation on the municipal level. Furthermore, as the more harmful effects of climate change are likely to take place in the future, this means that adaptation has to compete with other non-mandatory issues (Dannevig, Rauken, & Hovelstad, 2012).

Characterization and evaluation of the risk can help to prepare for decisions on how the risk should be managed. Risks associated with climate change are oftentimes characterized as emerging where there is a need for more comprehensive involvement of stakeholders. The characteristics of the emerging risks can also change over time. (IRGC, 2017) Risk evaluation should be based on the risk and vulnerability assessment to judge whether the risk is acceptable. When it comes to climate change, oftentimes the focus is on reactive adaptation measures, instead of proactive measures (Dannevig, Hovelsrud, & Husabø, 2013).

Management of risks includes design, decision-making, and implementation of different measures. The knowledge provided in previous phases of the IRGC model affects how decisions are made and which measures should be implemented to reduce the probabilities and consequences of an adverse event. It is in this phase of the risk governance process where the relevant stakeholders that are responsible for taking the decisions are also identified. As also highlighted, it is important to realize whether the stakeholders seen responsible of the risk management decisions have accepted this responsibility. The management of risks associated with a climate change can be seen as an iterative process. (IRGC, 2008) As

mentioned by IRGC (2008) one of the main deficits, that can also be seen in the light of climate change adaptation, is that some risks do not have a definite owner and thus there is no one entity that should be kept responsible for managing the risk. Furthermore, as the example from the Norwegian sewerage system also shows, implementing measures that are both costly, but moreover where decision-makers are relatively isolated from the impacts of their decisions, can sometimes lead to indecision.

Communication is a cross-cutting and central issue that should be integrated to all of the phases of the IRGC model. Communicating the risk enables the different stakeholders to understand the consequences of the risk, and as its best it helps relevant stakeholders “[...] to recognize their role in the risk governance process.” (IRGC, 2008, p. 14). Furthermore, as highlighted by IRGC (2008, p. 14) “[...] effective communication is the key to creating trust in risk management.” One of the identified and, in the light of this thesis, mentionable governance deficits related to communication are that sometimes “[...] one-way information instead of two-way communication prevents building a dialogue” (IRGC, 2008, p. 15). Furthermore, the way we communicate is an important ingredient of the decision-making process itself since it affects the level of trust between sectors. (IRGC, 2008)

Even though not explicitly mentioned in the framework, the IRGC has also acknowledged the importance of stakeholder involvement in risk governance. As with the risks with high uncertainties, it is highlighted to “[...] involve all affected stakeholders to collectively decide the best way forward.” (IRGC, 2008, p. 18) Yet, with risks that are characterized with ambiguity it is recommended to include “[...] societal debate about the risk and its underlying implications” (IRGC, 2008, p. 18). As climate change related risks can be seen as risks with high uncertainty but also ambiguity among the stakeholders, it is important to take into account “[...] the appropriate level of stakeholder involvement in the process.” (IRGC, 2008, p. 18). This is especially true with wicked problems⁶ that should be handled across sectors, like problems stemming from climate change. It is therefore important to highlight one of the deficits: “paralysis by analysis”, in stakeholder involvement, that emphasizes that “[...] selection of an overly inclusive process leads to inertia or indecision”. (IRGC, 2008, p. 19) Thus, as also emphasized in relation to Turners information perspective: “[...] it is necessary to focus on the processes through which information is disseminated, combined and interpreted. (Rosness, et al., 2010, p. 75).

Even though the IRGC’s framework acknowledges the importance of cross-cutting aspects such as stakeholder engagement and communication, the importance of inter-disciplinary, or as is the case in this thesis, cross-sectoral collaboration is not explicitly mentioned in the model as one of the risk management strategies. Furthermore, the IRGC framework, even though a common way to conceptualize the risk management process, provides little practical

⁶ See definition of wicked problems in Section 4.2

information for handling the risks on the ground. I would therefore argue that these kinds of models are far too normative to be directly applied in a practical level and to specific problems. This normativity is also highlighted by IRGC (2008, p. 22): *“The framework is not intended as a recipe or a checklist which can guarantee that all the relevant aspects are considered when analyzing a risk and its governance process and structures. It cannot replace thinking, or that matter, creativity.”* Therefore, I dare to argue that the missing aspects from the framework are both vertical, i.e. organizational and especially horizontal collaboration. Turner’s information perspective with man-made disasters also hints towards the importance of collaboration by highlighting the need to *“[...] understand the mechanisms through which some warnings gain the attention of decision-makers and eventually lead to preventive action, whereas other warnings are ignored or rejected.”* (Rosness, et al., 2010, p. 75)

As will be revealed in the following Sections, these cross-cutting issues of collaborative governance are important to take into account when handling emerging risks related to wicked issues, such as climate change.

4.2 Breaking the silence between silos – Importance of cross-sectoral collaboration

As the risks related to climate change touch many sectors, they should also be handled collectively. Yet, as already mentioned in previous section, emerging risks caused by climate change are characterized by high uncertainty, ambiguity, and unclear boundaries of ownership. To better understand the different mechanisms that affect risk governance in a municipal level, we should look at the handling of risks from two different perspectives: from organizational, or vertical governance, perspective and by taking into account the collaboration between different sectors.

The approach towards which the case study in this thesis is looked into is ultimately based on the work of two scholars. Ostrom (2010) highlights the importance of collective action, whereas Rasmussen (1997) draws attention to vertical governance structures and unconscious interaction of different actors. The work of these two scholars is fundamental to understanding why we should look at climate change adaptation from these two perspectives.

4.2.1 Wicked problems and collective action

Since climate change related problems do not have one single owner, adapting to the changing climate should also happen on multiple levels and within several sectors. Problems stemming from climate change have previously been described as wicked problems. The definition of wicked problems was originally designed by Rittel and Webber (1973), who used the term to refer to problems that are transboundary and thus difficult to define and inherently unsolvable. They argue that problems that different planners dealt with are inherently wicked. Since wicked problems lack a definite formulation, the problems can be

framed in many different ways depending on one's perspective. Stemming from the previous, wicked problems are never truly solved since each new insight of the problem improves one's understanding of the problem and the ways it should be addressed. It could thus be said that there are no true or false solutions to wicked problems, only better or worse, based on interest and values. Furthermore, as stated by Rittel and Webber (1973, p. 165) "*every wicked problem can be considered to be a symptom of another problem.*" This refers to an observation that a wicked problem can usually be traced back to a deeper underlying challenge. Every wicked problem is also unique and depends on the particular context of how the problem should be solved. (Rittel & Webber, 1973)

Ostrom (2010, p. 550) also recognized the importance of collective action and calls problems caused by climate change "*collective action problems*" that require collaboration across different disciplines and sectors. Thus, the risks and vulnerabilities posed by climate change have to also be assessed collectively. Yet, there exist several constraints and conditions that affect whether or not climate change adaptation is integrated into different municipal sectors and processes. Sometimes deficiencies in national legislation is hampering the adaptation process. Despite of clear signals from a national level, some Norwegian municipalities have addressed the climate change adaptation and added it to their municipal agenda. Research by Dannevig, Hovelsrud & Husabø (2013) has investigated the underlying reasons for this and found out that "[...] *the ability and effectiveness of local collective actions is the most important determinant of adaptive capacity.*" (Dannevig, Hovelsrud, & Husabø, 2013, p. 491) As furthermore pointed out, collective actions, i.e. collaborations are related to social learning which again "[...] *are facilitated through informal networks between academics, NGO representatives and officials.*" (Dannevig, Hovelsrud, & Husabø, 2013, p. 491) In this context, "*collective actions*" are defined as different stakeholders working together towards a common aim, whereas "*social learning*" stems from a notion that certain stakeholders are able to learn from each other when given an appropriate learning platform. (Ostrom, 2010)

Creating efficient mechanisms to cope with the wicked problems associated with climate change entails that there are several sectors involved with both assessing and finding adequate solutions to address the risks climate change is about to bring. Furthermore, as "[...] *individuals do not possess perfect information but are capable of learning as they interact in a particular setting*", it is justified that local collective action is the best way to find out the most appropriate solutions to climate change in a given time (Ostrom, 2010, p. 552). Furthermore, these kinds of [collaborative] settings where different people from different sectors can meet up "[...] *tend to enhance innovation, learning, adaptation, trustworthiness, levels of cooperation with participants, and the achievement of more effective, equitable and sustainable outcomes at multiple scales [...]*" (Ostrom, 2010, p. 552). What is more, creating meeting spaces for different sectors encourages face-to-face discussions and thus fosters mutual understanding and trust building. By doing so, the system, or municipality as is the

case in this thesis, will at least in principle be more climate-resilient and robust. The positive cumulative effect of collaboration should thus be clear. (Ostrom, 2010)

Yet, “[...] most governance mechanisms are designed at a single level - whether international, national, regional or local - and do not provide effective solutions for the problems that should be solved in many levels” (Nagendra & Ostrom, 2012, p. 104). Furthermore, as highlighted by the same authors, decentralization often does not recognize the importance of oftentimes complex interaction between different sectors and levels of governance. As it also seems, the existing normative models, such as IRGC’s risk governance framework presented in the previous section, often seem to underestimate, or at least not highlight enough, the importance of effective collaboration between different sectors and disciplines.

The work of Rasmussen (1997) contributes to the work of Ostrom (2010) by taking into account vertical interaction. He (Rasmussen, 1997) introduced a multilevel approach in risk management where he emphasized that we should also acknowledge the different levels and the interaction between these levels in order to fully understand and handle the risks. The approach by Rasmussen (1997) will be opened up in the following subsection.

4.2.2 Rasmussen’s multilevel approach in risk governance

Rasmussen (1997) introduced a multilevel approach in his study on industrial risk management where he emphasized the importance of acknowledging the different levels that ultimately affect the handling of risks. His approach can also be utilized when looking at climate change adaptation.

Figure 3 illustrates Rasmussen’s approach, which takes into account different levels involved in risk management. Rasmussen (1997) illustrates risk

management as a socio-technical system that is influenced by many levels of politicians, government and management by laws, regulations and procedures. At the top, the political climate sets the frames for the national level priorities. National legislation makes national priorities explicit and ultimately sets boundaries for the lower levels of governance. As figure 3 also emphasizes, there are several environmental stressors that affect the risk management

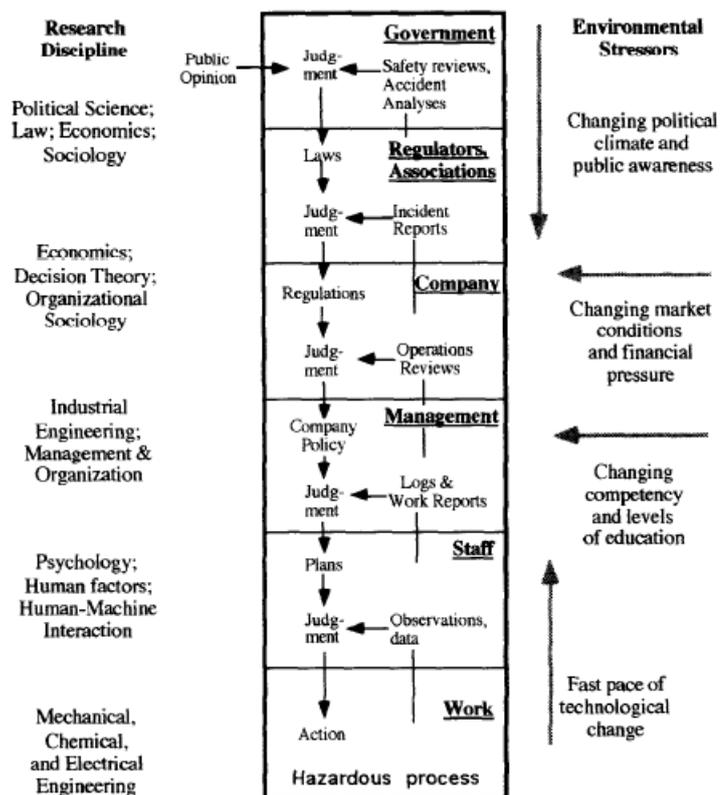


Figure 3 The socio-technical system involved in risk management (Rasmussen, 1997, p. 185)

on the ground such as public opinion, political climate, and market conditions. At the higher levels of the system “[...] *different objectives and values are formulated in rather general terms.*” (Rasmussen, 1997, p. 195). When these different objectives or laws and regulations are moved downward to a lower level where they should be put in action, the degrees of freedom of interpreting them increase depending on the context.

Even though Rasmussen (1997) recognizes that there are several disciplines involved at each of the various levels, he does not explicitly mention collaboration between different disciplines, or sectors. I would therefore argue that Rasmussen’s model (created over 25 years ago) reflects the traditional way of hierarchical coordination that has an emphasis on vertical coordination. This reflects back to Weber’s theory of bureaucracy (Weber, 1947 in Christensen et al., 2016, p. 318). Yet, Rasmussen’s model can be utilized when looking at climate change adaptation. This is done in the following subsection.

4.2.3 Cross-sectoral collaboration in different governmental levels

When considering different frameworks for managing emerging risks related to climate change, we should not see the different sectors in isolation but always include collaboration between various sectors at different levels of governance in the picture. This enables a more nuanced understanding and managing of the risk. In particular, local level networks should be in focus. Different local networks and alliances can impact the way decisions are made and they can thus contribute to bottom-up changes that can potentially also influence the national level.

Rasmussen’s multilevel approach in combination with cross-sectoral collaboration can also be applied to climate change adaptation. The illustration in figure 4 uses Rasmussen’s previously presented model (figure 3) as an inspiration to describe the collaboration and coordination practices between different sectors at multiple levels. As one of the four Norwegian principles of societal safety (see 3.1.1) also revealed, the crises - or risks - should be always handled at the lowest possible level of government. Having this principle of *proximity* in mind, it is easy to argue that both the collaboration and coordination between the sectors should ultimately happen at the municipal level. Creating a larger knowledge-base of the choices and decisions made requires collaboration between different disciplines and sectors on multiple levels of governance. Furthermore, as pointed out by Rasmussen (1997), since the couplings between different systems are getting tighter, we cannot see these systems (or sectors) in isolation from one another.

As figure 4 also illustrates, there are several environmental stressors that affect risk management or climate change adaptation on the ground. National focus on climate change mitigation, which ultimately stems from political decisions, sets the framework conditions for several other disciplines and sectors at the lower levels of governance. Furthermore, current market conditions, i.e. relatively short-term economic interests to build in areas exposed to long-term effects of climate change, can also be seen as environmental stressors. Again, the interdependencies between national level priorities and local level decisions (to, for instance,

build densely) should be seen in the same context. Thus, for example, decisions to build on areas that are exposed to the effects of sea-level rise should not be seen in a vacuum.

Yet, it is unlikely for cross-sectoral collaboration to happen voluntarily, as it requires management commitment and efficient coordination. That is especially true with the wicked problems such as coping with the effects of the climate change. Ultimately, the coordination practices should happen on the lowest possible governmental levels.

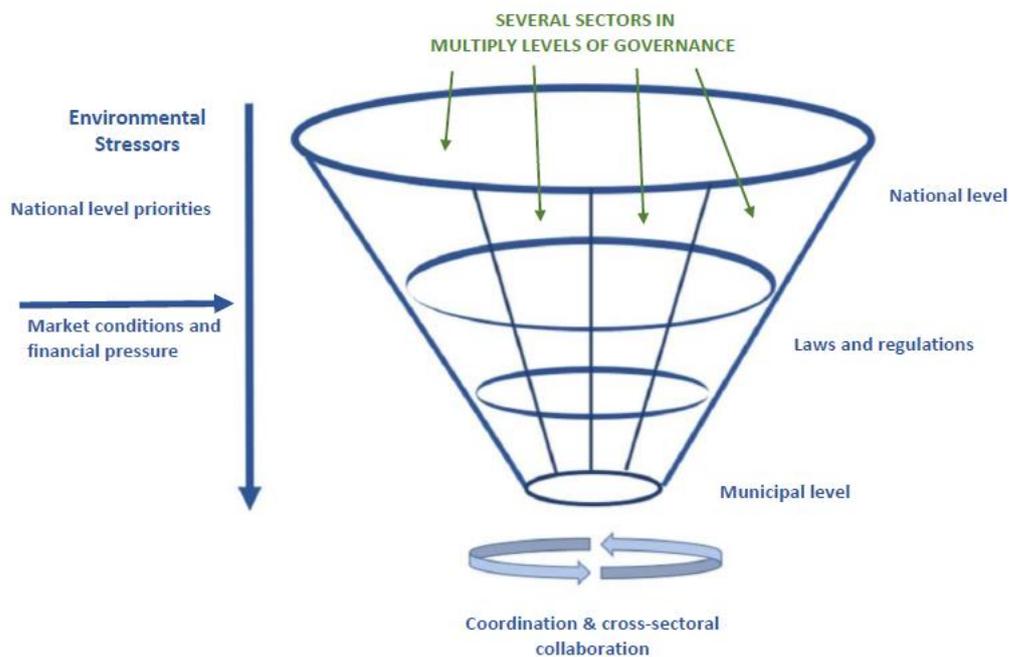


Figure 4 Cross-sectoral collaboration between different sectors in multiply levels of governance.

Success factors for implementing climate change adaptation in Norway

As Rasmussen's study found (1997), there can be other, more salient issues that have higher priorities than safety. The same applies with climate change adaptation, such as with safety issues that general compete with other "[...] more short term financial and survival criteria rather than long term criteria concerning welfare, safety and environmental impact." (Rasmussen, 1997, p. 186). In Norway some Norwegian municipalities have started to add climate change adaptation to their municipal agenda, despite clear national guidelines. Research by Dannevig, Hovelsrud & Husabø (2013) found that the following common factors helped for adding climate change adaptation to the municipal agenda in Norway: engaged officials and institutional capacity, extreme weather events, real-world indicators, and involvement in research projects. These factors were already touched upon in Section 4.1.2. The role of engaged officials and institutional capacity is central for adding climate adaptation to the municipal agenda. According to the research by Dannevig, Hovelsrud & Husabø (2013, p. 497) in Norwegian municipalities where "[...] climate adaptation has progressed, it is predominantly because administrative employees were engaged in the issues and particularly

interested in the consequences of climate change.” This is particularly true in larger municipalities where the institutional capacity can afford to focus on non-mandatory [municipal] tasks as well. Therefore “*[...] efforts of engaged officials should not be seen in isolation from the administrative capacity or organizational structures of the municipalities in which they work.*” (Dannevig, Hovelsrud, & Husabø, 2013, p. 498). Extreme weather events such as mudslides in residential areas, major floods causing extensive damage, and storms causing power failure can indirectly contribute to the inclusion of climate change adaptation on a municipal agenda. These kinds of extreme weather events can eventually lead to a stronger focus on utilization of RVAs in municipal planning processes. (Dannevig, Hovelsrud, & Husabø, 2013) Real-world indicators are minor events that, unlike extreme weather events, do not receive mass media attention. These can be related to, for example, the handling of rain water and inadequate drainage systems. The previously described sewerage system in Norway is a perfect example of real-world indicators (see section 4.1.1). Without engaged municipal officials, and with the absence of specific laws, these kinds of emerging risks are easy to overlook beforehand – and in contrast even easier to recognize in hindsight. Furthermore, as already highlighted in Section 4.1.2, involvement in research projects can contribute for adding climate change adaptation higher up in municipal agenda. Different projects, alliances, and networks are also beneficial for municipalities and can encourage the lifting up of climate change adaptation higher on the municipal agenda. As with real-world indicators, Dannevig, Hovelsrud & Husabø (2013, p. 500) also argue that “*[...] the initial involvement in the [research] project is oftentimes due to engaged and interested officials*”.

Furthermore, as Rasmussen (1997, p. 196) highlights: “*[...] information on an actual state of affairs*” is an important step in risk management as “*no control system will function better than its measuring channel*” (Rasmussen, 1997, p. 196). Having a sufficient knowledge-base is therefore crucial. Even though climate change includes a high degree of uncertainty, and the future impacts are difficult to predict, there exist certain climate projections - for instance, the amount of precipitation and sea-level rise - that should be sufficient to estimate the future effects of climate change. Yet, referring back to Rasmussen’s model, we need to be aware that in many cases the ones making the decisions are far away from the actual “*state of affairs*” and are looking at the world from their “*bird’s eye*” perspective. Accompanied with this observation, and with the fact that decision-makers are forced to, oftentimes unconsciously, choose between different objectives that are “*[...] a matter of balancing on the edge[...]*” (Rosness, et al., 2010, p. 79), it is easy to agree with Rosness et al. (2010, p. 79) when they highlight that sometimes decision-makers do not “*face the choice at all.*” Furthermore, and in the light of this study, most importantly, due to existing cultural beliefs and norms, and what Turner’s theory of man-made disasters also reminds us, there exist “*[...] critical divergence between those assumptions and the ‘true’ state of affairs.*” (Pidgeon & O’Leary, 2000, p. 16).

As will be seen in the following section, the collaborative challenges within societal safety are already being acknowledged in Norway. This adds up to the importance of collective action,

furthermore to collaborative governance and ultimately to the urgent need for more research on factors enhancing the collaborative process itself.

4.3 “Still going wrong” -challenges in collaboration and coordination in Norway

As stated in the previous section, ultimately wicked problems should be handled collectively. Furthermore, as some norms in our society are culturally taken for granted it is of the utmost importance to collaborate across sectors to learn from each other's perspectives, create innovative solutions, and most importantly, to enhance trustworthiness. (Ostrom, 2010; Pidgeon & O'Leary, 2000) As this thesis offers a snapshot of collaboration efforts between different municipal sectors within climate change adaptation in one Norwegian municipality, this section sets the focus on reviewing a few of the relevant national studies on collaboration and coordination efforts in the field of societal safety. As will be shown, the challenges in collaboration and coordination within societal safety are nothing new in Norwegian society.

4.3.1 Deeper look into Norwegian principles for societal safety

The risks related to climate change are increasingly transboundary, crossing many sectors and administrative levels. Therefore, there is an urgent need to handle these risks also across these horizontal and vertical sectors and levels. In Norway, one of the principles of societal safety requires collaboration between sectors, as described in section 3.1. I argue that coordination is a pre-requirement for effective collaboration. Yet, while the Norwegian first three principles of societal safety “[...] *responsibility, similarity and proximity are concentrated among different forms of specialization, they have a little to offer when it comes to coordination that is even more urgent problem [...]*” (Fimreite, Lægreid, & Rykkja, 2014a, p. 245)

The successful handling of risks related to societal safety often takes place at the interfaces between different sectors and organizational levels. The same applies to climate change adaptation. Yet, the sectors, or sectoral silos, are usually so specialized that the coordination and collaboration between them can be rather challenging. As the Norwegian administrative system is characterized by rather strong and relatively independent sectors that are somewhat independent from one another, the coordination both between but also within these sectors is weak. (Fimreite, Lægreid, & Rykkja, 2014b) Therefore, it is easy to agree with Fimreite et.al (2014a, pp. 245-246) when they state that “[...] *it is still unresolved how [the principle of] collaboration can go hand in hand with the [principle of] responsibility.*” At the same time, just like in general with different fields of societal safety, so too is climate change adaptation characterized by fragmented decision-making and unclear responsibilities between different sectors. The work and responsibility are spread over many sectors in different organizational levels, and thus no one has overall responsibility (Fimreite, Lægreid, & Rykkja, 2014b). Furthermore, the challenge of coordinating is a fundamental problem in Norwegian central administration as “[...] *it is difficult to establish a strong coordinating body to handle complex issues that should be handled across strong ministries.*” (Lango, Lagreid, & Rykkja, 2014, p. 74) The same authors argue that sometimes the coordination that seems to

occur is so-called “*negative coordination*” (p. 74) that is characterized by focusing on issues that are outside the responsibility of other departments or units instead focusing on issues that directly matter for other departments. Furthermore, the *negative coordination* is noted by lack of follow-up activities.

The same study (Lango, Lagreid , & Rykkja, 2014) found out that the departments who were supposed to have the coordinating role had rather weak instruments to use e.g., they did not have enough mandate and authority for disposition. Even though the intentions for strengthening coordination might be there, the lack of instruments hindered efficient coordination. This can also have implications for cross-sectoral collaboration. It is good to realize that even though the study by Lango, Lagreid & Rykkja (2014) had the focus on the ministerial level, I argue that these same challenges and fundamental reasons behind them could potentially also be resonated downwards to the local, i.e. municipal, level.

4.3.2 Collaboration challenges within societal safety in Norway

The research done by Almklov et al. (2017) discusses the challenges in interagency collaboration within societal safety in Norway. Their research set the focus on the relationship between organizational culture, [lack of] cross-sectoral collaboration, and societal safety. Even though the case study by Almklov et al. (2017) focuses on the events of 22nd July⁷, not in risks related to climate change, their findings reflect the challenges in cross-sectoral collaborations and coordination efforts in the public sector in Norway. Thus, their findings, which are based on case study evidence from 67 interviews from different governmental levels in Norway, offer a valuable asset to this thesis.

According to their main findings, cultural differentiation, i.e. cultural boundaries between different groups and organizations is a fundamental factor affecting cross-sectoral collaboration. This also has an impact on societal safety. They argue that cultural differentiation is one of the factors why collaboration, in spite of coordination, is not effective in some cases. By cultural boundaries they mean the gaps between different organizational cultures, cultural dynamics between different groups, and perceived cultural differences. These cultural boundaries are characterized by conflicting interests and objectives. Furthermore, cultural differences are argued to be explanatory factors in challenges within cross-sectoral collaborations and coordination. Thus gaining “*knowledge about boundary processes is important to change processes and the successful implementation of improvement measures*” (Almklov et al., p. 2). Furthermore, decreasing the [cultural] gaps between different groups (and members of a group) is highlighted to be one of the best cures

⁷ 22nd July incident is referring to the terrorist attack in Norway in 2011, where a right-wing terrorist conducted two attacks. His first terrorist attack, a bombing in the government district in Oslo, killed eight. His second target was a youth camp in the island of Utøya, where he shot 69 people to death. This terror attack has inspired many scholars to investigate the weaknesses of the agencies that are involved maintaining societal safety and security.

to reinforce the collaboration and coordination. It is rather easy to agree with these scholars when they state that *“better understanding and addressing inter- and intra-organizational cultural differentiation is necessary to deal with the coordinative challenges in societal safety”* (Almklov et al., 2017, p. 2). Thus, before we can improve the collaboration efforts between different groups and decrease the [cultural] gap between them, we first need to explore and understand these cultural differences. Based on the research, they generalize that *“there are persistent problems with inter-agency coordination and collaboration for societal safety in Norway”*. (Almklov et al., 2017, p. 2) Therefore, the challenges in cross-sectoral collaboration in what Almklov et al. (2017, p. 2) refer to *“silo-based public sector”* are not new in Norway. Yet, the research specifically focused on cross-sectoral collaboration and coordination within climate change adaptation is lacking. One of the explanatory factors for the lack of research might stem from the national level, which, for the time being has set an emphasis on climate change mitigation over adaptation.

How the differences between groups manifest themselves and in what way the cultural differentiation between - and within - the groups influence collaboration is a puzzling question. According to the research by Almklov et al. (2017), the cultural differentiation between and within the groups influences collaboration in different ways depending on the context. Their research emphasised *“the value of local knowledge and personal networks”* (Almklov et al., 2017, p. 7) that was more apparent in smaller municipalities. This resonates well with Ostrom’s (2010) study that also highlighted the advantage of using local knowledge and learning from others. Thus, there are important findings that we can take from smaller municipalities with shorter distances between sectors. In smaller municipalities, these kinds of personal networks and relationships seem to make collaborations easier in practise and also allow informal ad hoc collaboration. (Almklov et al., 2017, p. 7) Thus it is argued that informal structures make collaboration easier than formal structures. (Almklov et al., 2017) Looking at this observation within the lenses of the case study chosen for this master thesis, that of the cross-sectoral working group for climate change adaptation (see Section 2.2.2), I dare to hypothesise that the working group works as an excellent example for discovering different factors to improve the process itself.

As was seen, even though acknowledged as important, cross-sectoral collaboration is not a straightforward task than just happens automatically. While different groups interact in shared settings, they are influenced by *“different frames of reference areas of expertise and language”* (Almklov et al., 2017, p. 4). Yet, research shows that there is some mechanisms and immediate factors that can help to improve the collaborative process itself. The following Section sets the focus on these aspects.

4.4 Success criteria in collaborative governance

As highlighted in previous sections, managing emerging risks, such as the ones stemming from climate change, should be handled collectively across different disciplines and sectors. Yet, in

practise this is not a straightforward task and does not happen automatically. There are some fundamental mechanisms that can hinder cross-sectoral collaboration in climate change adaptation. One of these is related to the national level priorities that are oftentimes favouring climate change mitigation over adaptation. Moreover, the collaborative process itself can be hindered by many factors.

Acknowledging the underlying mechanisms and more direct factors that affect the cross-sectoral collaboration are important. The focus of this section is therefore put into concrete descriptions of these qualities that need to be at least partly present to ensure successful cross-sectoral collaborations and cross-sectoral teams. These qualities, or success criteria, are based on the work of Ansell and Gash (2007) and their model of collaborative governance.

4.4.1 Defining Collaborative Governance

Ansell and Gash (2007, p. 544) define collaborative governance as *“a governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-making process that is formal, consensus-oriented, and deliberative and that aims to make or implement public policy or manage public programs or assets.”* Even though generic, this definition of collaborative governance can also be seen in the light of cross-sectoral collaboration in climate change adaptation. Common features are that the collaboration efforts are initiated by public agencies, or as is the focus of this thesis, certain municipal sectors.

In their definition, Ansell and Gash (2007) also include non-state actors. As with climate change adaptation, these non-state actors could, for instance, include the power companies that own the power grid and/or property owners. As climate change adaptation touches several sectors in various governmental levels, or as Ansell and Gash refer to them, public agencies, ultimately there should be also several sectors included in the collaboration efforts with climate change adaptation. Even though this study is limited to the collaboration efforts between different municipal sectors, it is good to bear in mind that potentially, and in the ideal world, non-state stakeholders found in the above-mentioned definition of collaborative governance should also be included in what Ansell and Gash refer to as *“collective decision-making.”*

Looking at collective decision-making through the lens of this thesis, the *collective process* is understood in the very same way as described by these two scholars who emphasised that *“[...] collaboration implies two-way communication and influence between agencies and stakeholders and also opportunities to stakeholders to talk with each other.”* (Ansell & Gash, 2007, p. 546) Optimally the decisions shall not be made by one individual but together in a group. This emphasises the importance of the collaborative process itself. Ansell and Gash also highlight that the collaboration should be formal, organised, and explicit, thus leaving out the more informal and casual conversations that are often spontaneous. Even though

consensus is oftentimes not possible, nor even justified, the decisions should be made in concord. (Ansell & Gash, 2007) Finally, the focus should be on public issues, such as climate change adaptation, with the ultimate aim to “[...] *make or implement public policy or manage public programs or assets.*” (Ansell & Gash, 2007, p. 544).

4.4.2 A model of Collaborative Governance

Ansell and Gash (2007) created a simplified model of collaborative governance based on the findings of a meta-analysis of 137 case studies. The model, illustrated in figure 5, presents some of the key variables and their relationships that affect the collaborative governance. The model is divided into four broad variables: starting conditions, institutional design, facilitative leadership, and collaborative process.

All of these variables have either a direct or indirect effect on the outcomes of the collaborative process itself. The model can be utilised to identify and analyse the different hindering and reinforcing factors to the collaboration efforts. Acknowledging these factors also helps to recognize the improvement potential that can led to better outcomes for the collaborative process itself.

The core of this model is the collaborative process itself with more detailed variables. The variables of starting conditions, institutional design and leadership qualities are seen more as supporting ones for the process itself, leading to the outcomes. An example of these outcomes could be municipal climate change adaptation plan that touches many sectors. In the following each of these broad variables are further explored.

Starting conditions

Certain underlying mechanisms can either facilitate or hinder the collaborative process. Even though these are at the outset of the collaborative process itself, to gain a deeper understanding of the underlying mechanisms is crucial to be able to understand the framework conditions for the collaborative process.

As illustrated in figure 5, starting conditions have three broad variables. The first variable, *power, resource, and knowledge asymmetries* can stem from the lack of management support that can lead to some stakeholders not having the necessary time and resources available. Furthermore, in certain cases the imbalance between different, and oftentimes conflicting objectives can lead to “[...] *disadvantage in contests with representatives of relatively more cohesive and more easily organized economic interests.*” (Ansell & Gash, 2007, p. 551). This is especially true with wicked problems with long-time horizons such as climate change. National-level priorities that also affect the laws and regulations are also important, as these priorities also resonate on the local level and to the work of certain municipal sectors. (Rasmussen, 1997) In regards to climate change adaptation, it has “[...] *to various degrees been added to the political agenda in all industrialized countries, [...] adaptation measures are yet to be implemented in legislation and are, therefore, in practise voluntary undertakings.*” (Dannevig, Rauken, & Hovelstad, 2012, p. 1). The influence of the different time-lags between higher level objectives and lower, or rather local, level measures have also been highlighted by Rasmussen (1997). Furthermore, and in practise, these time-lags can hinder the efforts to

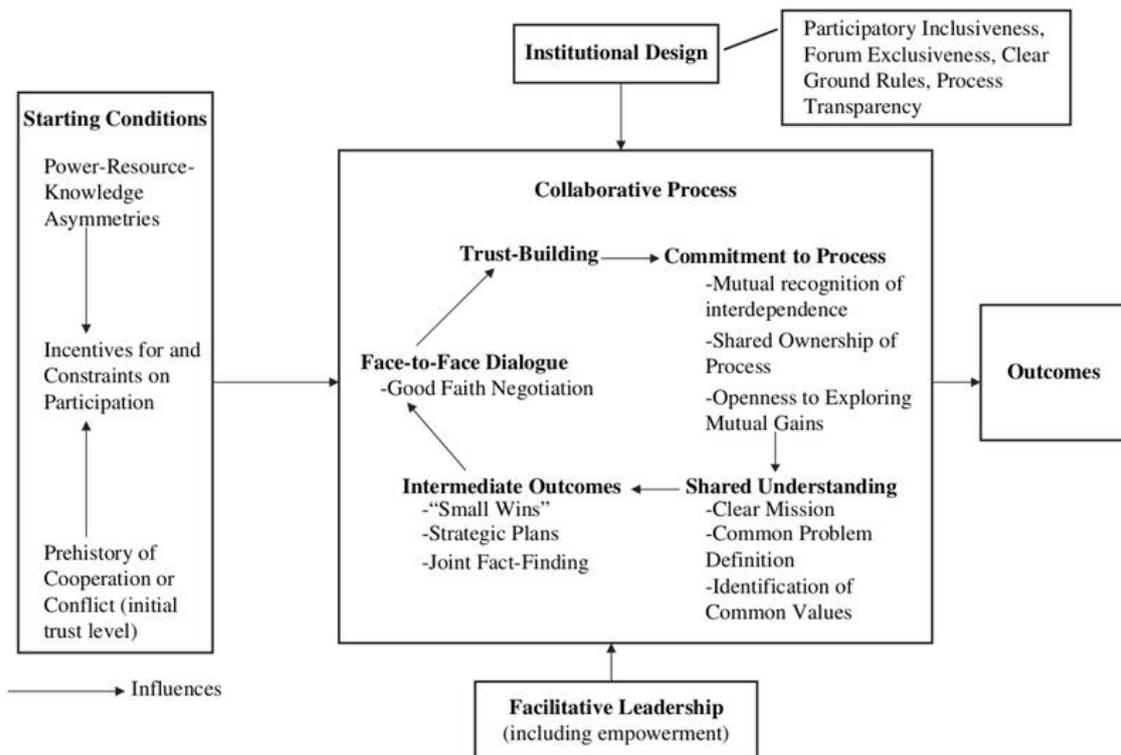


Figure 5. A model of Collaborative Governance (Ansell & Gash, 2007, p. 550)

set greater focus on long-term adaptation measures over the more short-term financial criteria. (Rasmussen, 1997) Thus, the priorities set at the national levels resonate to local level decisions and practises and should therefore be acknowledged.

The second variable *incentives for and constraints on participation* (see figure 5), stems from the power and resource imbalances as the efforts spent on collaborative process should yield to meaningful results benefitting the stakeholders. As the findings from Ansell and Gash (2007, p. 552) highlight: *“incentives increase as stakeholders see a direct relationship between their participation and concrete, tangible, effectual policy outcomes [...] but they decline if stakeholders perceive their own input to be merely advisory or largely ceremonial.”* They go on to state that incentives to participate in collaborative processes are low in cases where the goals (of the stakeholders) can be reached independently through other means. One such incentive is the collaborative process itself, especially if it is seen as an *“exclusive forum for decision-making”* (Ansell & Gash, 2007, p. 552). As Ostrom (2010, p. 550) also highlighted, and as was already stated in Section 4.2.2, *“collective action problems”* the craving for collaboration and thus incentives *“[...] increase if stakeholders perceive achievement of their goals to be dependent on cooperation.”* (Ansell & Gash, 2007, p. 552).

The third variable, *prehistory of cooperation or conflict* between different stakeholders can either facilitate or hinder collaboration efforts. Yet, in some cases conflicting views can also *“[...] create a powerful incentive for collaborative governance.”* (Ansell & Gash, 2007, p. 553). This is especially true in cases where the interdependencies are high and acknowledged. (Ansell & Gash, 2007) I would argue that at its best, the conflicts stemming between climate change mitigation and adaptation can lead to these kinds of conflicting views that could potentially improve the collaboration process itself. My argument stems from an observation that sometimes the mitigation measures such as urban densification can lead to negative effects on long-term climate change adaptation efforts. In practise, this example is closely related to the storm water management system and lack of availability of blue-green infrastructure. Furthermore, relating to urban densification, conflicting interests between long-term climate change adaptation and short-term financial pressure to build in areas which are exposed to the long-term effects of climate change, e.g. sea-level rise can be seen as these kinds of conflicts. Having these two observations in mind, and with a prerequisite that the interdependencies between mitigation and adaptation are being acknowledged, can eventually led to twisting around, what Ansell & Gash (2007, p. 553) call *“a vicious circle of suspicion, distrust, and stereotyping”* that is expressed with *“low levels of trust which in turn will produce low levels of commitment, strategies of manipulation, and dishonest communications”* into better *“social capital and high levels of trust that produce a virtuous cycle of collaboration.”* Thus, these prehistories, whether positive or negative, are powerful mechanisms that do have effects on the collaborative process itself.

Facilitative Leadership

Probably the best way to describe and highlight the importance of facilitative leadership, or coordination, to the collaborative process is to draw an analogy with the importance of a skilled orchestrator to a well-functioning symphony orchestra. Bringing different players

around the same table and “[...] *getting them to engage with each other in a collaborative spirit*” is the key characteristic of successful leadership (Ansell & Gash, 2007, p. 554). Furthermore, “[...] *setting and maintaining clear ground rules, building trust, facilitating dialogue, and exploring mutual gains*”, are the key tasks of the successful leader in collaborative governance (Ansell & Gash, 2007, p. 554). As its best, a facilitative, or what Chrislip and Larson (1994 *in* Ansell & Gash, 2007, p.554) call “*collaborative leadership*,” manages to mobilize the stakeholders to move the whole collaboration process forward, and ultimately to a higher level (Ansell & Gash, 2007). To ensure the meaningful outcomes from a collaborative process itself, the leadership should “*stimulate creativity by synthesizing the knowledge of diverse participants so the group can create new ideas and understanding*” (Ansell & Gash, 2007, p. 555).

In regard to the wicked problems stemming from climate change, where incentives to participate in the collaborative process are oftentimes low, and power is asymmetrical, the importance of the facilitative and collaborative leader cannot be emphasised more. As furthermore pointed out by Ansell and Gash (2007, p. 555), in these cases it is better to use the so called “organic” leaders, “*who emerge from within the community of stakeholders.*” Even though it would also be possible to use professional, sometimes external mediators as brokers, there is a clear advantage to use the expertise found within the community itself. The necessary leadership qualities also depend on the context. (Ansell & Gash, 2007) This resonates well with what Ostrom (2010) also highlighted: using local knowledge to the highest possible sense. Furthermore, as effective and facilitative leadership is likely to be time-, resource-, and skill-intensive, in some cases using multiply leaders - or coordinators - is justified. (Ansell & Gash, 2007)

Institutional Design

As stated by Ansell and Gash (2007), institutional design refers to both basic protocols, and ground rules for collaboration that are important ingredients for the procedural legitimacy of the collaborative process itself.

Optimally, the process should be broadly inclusive, including both critical but also troublesome stakeholders. Including a broad enough spectrum of stakeholders to mirror the problem in hand is thus recommended. In contrary, “[...] *weak or non-inclusive representation threatens or undermines the legitimacy of collaborative outcomes.*” (Ansell & Gash, 2007, p. 556). (Ansell & Gash, 2007) However, it is good to bear in mind that excess inclusivism can lead to a diluted process; as more stakeholders collaborate, the more complex the process itself becomes. This is especially true with the wicked problems that potentially touch many stakeholders, and that are characterized by strong conflicting viewpoints. Framing the problem and setting the scope is therefore important to identify relevant stakeholders that are included in the process itself. Furthermore, as Ansell and Gash (2007, p. 556) also remind us: some stakeholders may have “*alternative venues for realizing their agenda.*” This is

especially true with the sectors that can see the financial benefits of different climate change adaptation measures in a relatively short time-span. One obvious example is power companies that have, at least in some countries, started to see the long-term financial benefits of having underground power lines. The bottom line, as stated by Ansell and Gash (2007, p. 556), is thus that *“inclusiveness is therefore closely related to exclusiveness.”*

The process should be transparent and clear. To increase the legitimacy, there is a need for clear a scope and firm deadlines. Since *“the collaborative meetings can be endless”* (Ansell & Gash, 2007, p. 557), having definite roles and timetables is important. Even though some of the findings of Ansell and Gash (2007, p. 557) pointed out that this can in some cases *“reduce incentives for long-term cooperation,”* I would argue that having clear and well-defined goals for the process itself can potentially ensure including more stakeholders to the collaborative process itself and taking it to a new level.

Collaborative Process

The collaborative process, which is the core of the model, should be seen as a cyclical and iterative process, as illustrated in figure 6. Ansell and Gash (2007) divide collaborative *process* into five more detailed variables or stages: face-to-face dialogue, trust-building, commitment to process, shared understanding, and intermediate outcomes. Such as communication is described as cross-cutting aspect in the IRGC model [see Section 4.1], also Ansell and Gash (2007, p. 558) highlight the importance of communication being *“at the heart of collaboration.”* Therefore, the description of the detailed variables will start with face-to-face dialogue. (Ansell & Gash, 2007)



Figure 6 Collaborative process has five interrelated variables (Ansell & Gash, 2007, p. 550)

Ansell and Gash argue that even though face-to-face dialogue is important, it alone is not an adequate condition for collaboration to succeed. Even though direct dialogue can also add up to the mutual disrespect, it oftentimes helps *“[...] breaking down stereotypes and other barriers to communication that prevent exploration of mutual gains in the first place”* (Ansell & Gash, 2007, p. 558). Ansell and Gash go on stating that face-to-face communication is *“[...] at the heart of a process of building trust, mutual respect, shared understanding, and commitment [...]”* and should therefore not be undervalued. (2007, p. 558) The importance

of trust-building stems from an observation that usually the common vantage point for the collaborative forums is lack of trust. This can stem from prehistory of conflict, as Ansell and Gash stated with their *“vicious circle of suspicion, distrust, and stereotyping”* (2007, p. 558), as already touched upon in the beginning of this Section. Therefore, cultivating trust, even though by no means an easy task, is an important aspect in the collaborative process itself. Here, facilitative leadership has a key role.

Commitment to the collaborative process is another crucial factor. (Ansell & Gash, 2007) Even though the focus of the process itself is on the actual stakeholders participating in the process, a weak commitment from management resonates to the lower levels and cannot be totally overlooked. Furthermore, as wicked problems such as the ones related to climate change are often not value-neutral, political commitment, even though not highlighted by Ansell and Gash, cannot be left without acknowledgement. In general, the original purpose or motivation of the collaborative process is closely related to the commitment which again depends on which stakeholders are participating in the process itself. Motivators can be various, from ensuring that one’s own perspective is heard, to securing the legitimacy of the process itself. (Ansell & Gash, 2007) As can also be seen from figure 5, shared ownership of the decision making process is one of the dimensions related to the commitment. Providing the participants with the feeling of ownership to the process goes hand-in-hand with shared responsibility. This co-dependency between ownership and responsibility is closely related to mutual recognition of interdependence. Trust is also a critical ingredient that affects commitment and can be seen as one of the building stones for openness to exploring mutual gains. (Ansell & Gash, 2007)

Shared understanding of the clear purpose and defining a clear scope that is possible to achieve collectively are important aspects in successful collaborations. As stated by Ansell and Gash (2007, p. 560), shared understanding *“[...] might also mean agreement on the relevant knowledge necessary for addressing the problem.”* Regarding risks posed by climate change, it is important to have access to the necessary knowledge base. Moreover, intermediate outcomes are concrete and small results steaming from the process that can be said to be *“[...] essential for building the momentum that can lead to successful collaboration.”* (Ansell & Gash, 2007, p. 561) These *“small wins”*, such as joint fact-finding, are, as Ansell and Gash also highlight (2007, p. 543) important to *“[...] deepen trust, commitment, and shared understanding.”*

Finally, as the figure 5 also suggests, we should not forget that, even though the collaborative process itself is important, ultimately the process should lead to outcomes that are also benefitting the society as a whole. At least to some extent.

4.5 Synthesis

As this chapter revealed, managing wicked problems related to societal safety, e.g. climate change adaptation, should ultimately be handled on multiple levels and across several sectors. One of the Norwegian principles of societal safety, that of *proximity*, reminds us that as crises always happen locally, i.e. in a municipality, they should also be handled at this level. Furthermore, the principle of *collaboration* highlighted the importance of cross-sectoral collaboration. (DSB, 2018) Both Ostrom (2010) and Dannevig, Hovelsrud & Husabø (2013) emphasized local collective action as the most important determinant to success in regards to climate change adaptation. Yet, if we want to solve wicked problems, we should also consider the deeper underlying mechanisms, i.e. challenges in our society that are related to vertical governance mechanisms at multiple levels. (Rittel & Webber, 1973; Rasmussen, 1997) In order to fully address and manage wicked problems related to climate change, we therefore need to be aware of the framework conditions that set the boundaries for the local level efforts between different municipal sectors. Several underlying mechanisms affect these priorities, e.g. market conditions and national level priorities. These elemental factors ultimately resonate to the local level, and affect cross-sectoral collaboration. (Rasmussen, 1997)

Norwegian research by Almklov et al. (2017) highlighted cultural boundaries being a fundamental factor that affects collaboration between sectors. As their research pointed out, in order to decrease these cultural boundaries, we first need to gain deeper understandings about boundary processes. By doing this we can ultimately find ways to improve these cross-sectoral collaborations. The model of collaborative governance introduced by Ansell and Gash (2007) can be utilized when looking at these boundary processes. The core of the model, the collaborative process itself, is highlighting the importance of two-way communication, i.e. dialogue between different sectors. Communication was also emphasised in the IRGC risk governance model (IRGC, 2017) and by Ostrom (2010) as a precondition for trust-building. Furthermore, as highlighted both in the model (Ansell & Gash, 2007) but also by several other scholars, creating learning platforms enabled both to understand and to discover better ways to address these problems. These kinds of meeting places increase the inter-dependencies between different sectors, and consequently enable them to decrease these cultural boundaries. (Almklov et al., 2017; Dannevig, Hovelsrud, & Husabø, 2013; Ostrom, 2010)

Research shows that coordination between Norwegian “*silo-based public sector*” is a challenging task. (Almklov et al., 2017, p. 2 & Fimreite, Lægreid, & Rykkja, 2014a) Therefore, even though it is important to realize the importance of facilitative coordination, it is also crucial to acknowledge the influencing factors that are at the outset of the collaborative process itself. These underlying mechanisms are characterized, for example, by conflicting objectives on the national level, and asymmetries in power, resource, and knowledge distribution. These are powerful mechanisms that do have an impact on whether

stakeholders see the benefits of participating in the collaborative process at the first phase. (Rasmussen, 1997 & Ansell & Gash, 2007)

5 Description of the case study

This chapter introduces the case study to the reader, offering rich descriptions of the case municipality, and giving a basis for chapter 6 (discussion), where the research questions are answered. The main aim of this chapter is to describe different factors as well as underlying conditions and mechanisms that can either hinder or facilitate a cross-sectoral collaboration in the case municipality. The chapter is divided into four sections. The chapter starts with an overview of the case municipality's work towards climate change adaptation, with description of strategies and approaches (5.1). In Section 5.2 factors that are directly related to the group processes and that can either encourage or challenge the cross-sectoral collaboration are being introduced together with suggestions for improvements from the informants. Underlying (vertical) conditions and mechanisms that has an effect on either the cross-sectoral collaboration or municipal climate change adaptation in general are described in Section 5.3.

5.1 Addressing climate change adaptation -approaches of the case study municipality

The main aim of this Section (5.1) is to enrich the strategies and approaches presented in chapter 3 with rich descriptions attained from the interviews. The overview of the Norwegian governance system presented in chapter 3 revealed some aspects that have relevance to the municipal-level approaches. One of the mentionable issues is the lack of national strategies that would specifically address climate change adaptation. As it is today, the focus is more on climate change mitigation, which is reflected by municipal planning processes. Even though the national emphasis on climate change mitigation is also mirrored by the different practices and approaches in the case municipality, there are still some local efforts that are being done to bring climate change adaptation higher up in the municipal agenda. This section is divided into four main themes:

- The current strategies for climate change adaptation at the case municipality
- The importance of individual efforts for setting climate change adaptation higher up in a municipal agenda
- Cooperation with research institutions
- Missing interface between climate change mitigation and adaptation

This Section gives the basis for answering research question 1: *What characterizes existing strategies and approaches to climate change adaptation in the case municipality?* As already

mentioned, all of the research questions are being answered and mirrored against the theoretical considerations in the chapter 6.

5.1.1 Current strategies for climate change adaptation

Currently, the case municipality has four main strategies on climate change adaptation. Two of these strategies are central to the case municipality and directly related to internal processes. Integrating climate change adaptation to relevant municipal sectors is one of the strategies. Implementing regular vulnerability analysis, together with producing the very first municipal climate change adaptation plan, is also a central strategy. According to the climate change adaptation coordinator, the climate change adaptation plan will also act as a central document, together with the climate change mitigation plan. Yet, and as it is at the moment, even though the overall climate change mitigation and adaptation plans are presented in the same document, in practice the interfaces between these two approaches is missing. This became apparent while conducting the interviews, but also the current documents utilized to make the interview guide hinted in this direction. The missing link between climate change mitigation and adaptation will be further discussed in subsection 5.1.4.

Apart from working with the first climate change adaptation plan for the case municipality, one of the main tasks for the working group has been to work with the RVA-analysis. According to the coordinator, the working group has been focusing specifically for adding up climate change related risks for the municipal RVA-analysis. The so called *KlimaROS*, as the coordinator calls it, is relatively new in Norway and has been done for the first time for the case municipality. According to the coordinator, even though the climate change related part of the municipal RVA analysis was done internally in the working group, the external experts, e.g. from the Norwegian Water Resources and Energy Directorate (NVE) were consulted. It should be noted that none of the interviewed working group members have been involved in the RVA-analysis, but it was done with the previous members of the cross-sectoral working group. As already mentioned in the methodology chapter, as this study offers a snapshot of the current situation, and is thus not a longitudinal study, the previous members of the working group were left out from this study. Thus, gaining more detailed knowledge of the process (of conducting RVA analysis) has not been done.

The third municipal strategy on climate change adaptation is related to competence and research development through cooperation with research organizations. Thus, engaging with different research projects related to climate change adaptation can also be seen as an important approach to lift adaptation higher up in the municipal agenda. This cooperation will be discussed more in Section 5.1.3.

The fourth municipal strategy is related to cooperation with relevant partners on climate change adaptation together with strengthening the participatory planning with the citizens. Yet, within the case municipality, and regards to the cross-sectoral working group for climate

change adaptation, the focus is set internally on the municipal sectors, leaving out for instance energy companies, state railways, and the national road administration. Thus, it could be said that ultimately and in regard to climate change adaptation, the municipality is seen as an organization, not as a geographic area. According to the coordinator, this is partly due to the fact that climate change adaptation is such a new focus area in all of the Norwegian municipalities, and external actors will have to be taken into account in later phases.

5.1.2 The importance of individual efforts

Even though the national level strategies ultimately set boundaries and influence local level approaches, there are certain factors that can enhance climate change adaptation efforts on a municipal level. Engaged municipal officials are one of these factors that should not be overlooked when looking at the reasons why in certain municipalities climate change adaptation is set higher up in the agenda. As it became apparent, the current coordinator as the one who had initially established the working group for climate change adaptation, Furthermore, it also became apparent that even though the risks related to urban flooding have been acknowledged and are part of the municipal RVA-analysis, in practice implementing measures that decrease the risks of flooding are sometimes initiated by the actions of certain engaged municipal officials that have specific knowledge on the issue.

Cross-sectoral working group on climate change adaptation

As mentioned, the coordinator initiated the establishment of the cross-sectoral working group for climate change adaptation. As she pointed out “[...] I saw it at once, that with this theme [climate change adaptation] we have to work across sectors.” In fact, the position of the coordinator was also created by the very same engaged municipal official. As it is at the moment, the cross-sectoral working group includes representatives from five different municipal units (see details from Section 2.2.2). Currently, the coordinator is the only one working with the climate change adaptation in the Environmental Unit (Miljøenheten), as most of the other people working with the climate are focusing on climate change mitigation. This mirrors the national level policies (and ultimately political climate) on setting the priorities on climate change mitigation over adaptation. Furthermore, this strengthens the observation of the strong engagement of the coordinator to her position.

Ripple effects of individual efforts

There is currently many new construction and reconstruction projects going on inside the municipality’s boundaries, renovating one of the central public spaces being one of them. As it became apparent from the interview of a representative (hydrologist) from the municipal engineers (Kommunalteknikk), in the initial planning phase of the reconstruction, there was no intention to install the storm-water management system but rather to just give it a facelift. According to the interviewed hydrologist, installation of the storm-water management system to reduce the future consequences of excess precipitation and flooding was originally initiated by him and a few of his colleagues after informal chats by the coffee machine. As

stated by him, these casual conversations eventually led to the decision to make an initiative to also install a storm-water management system to the newly renovated public space. The initiative was ultimately accepted, despite the limited budget and extra resources (time and money) used to install the storm-water management system.

This example demonstrates how concerns of certain key individuals that have appropriate knowledge and are furthermore committed to their field of expertise, and who are able to reflect the current municipal practices from their professional perspectives and act accordingly, can have great importance. In municipalities that still have not experienced extreme weather events, these concerns are of the utmost importance. Furthermore, this example illustrates how informal relationships are of the utmost importance for ongoing cooperation.

5.1.3 Cooperation with research institutions

As one of the strategies for the case municipality's work towards climate change adaptation is competence development, through cooperation with research and development the case municipality is also actively involved in different national research projects related directly to climate change adaptation. Thus, apart from initiating the establishment of a cross-sectoral working group for climate change adaptation, the coordinator is involved in several research projects, networks, and alliances regarding climate change adaptation. In addition, the representative from Municipal Engineers (Kommunalteknikk) is involved in several networks and research projects related to climate change adaptation within his field (hydrology/storm-water management).

Again, as stated by the coordinator, it is oftentimes challenging that research provided by universities and different research institutions is not better oriented towards municipal needs. A possible explanation for this is both the lack of time and resources for municipal officials to apply the created knowledge, and the research organizations' knowledge-gap of the current municipal planning processes. Thus, the essence synthesized from the interview with the coordinator hints towards the need for more solution-oriented research and practical knowledge for the use of municipalities. Yet, as also became apparent, the hands-on knowledge offered by municipal officials is also beneficial to widen the horizon of researchers and research institutions and to integrate the more practical knowledge and municipal reality into their research. In addition, this can also help researchers to better understand which kinds of planning instruments are currently needed by municipalities, as the following quote by the coordinator clearly illustrates: "*[...] when I had the meeting with them (researchers), I mentioned the new National expectations (for climate and energy planning and climate change adaptation)*⁸ *[..] they did not know about these. In fact, they (the researchers in this*

⁸ *Statlige planretningslinjer for klima- og energiplanlegging og klimatilpasning*. NB. Climate change adaptation is included to the guidelines first time as from 2019. (Lovdata, 2018)

specific project) had never heard about these national expectations [...] and these are perhaps the most important national guidelines we (municipalities) get from the national level and eventually from politicians [...].” It was highlighted that there is a need for a more bottom-up approach, starting from the municipal needs that are ultimately implementing many of the adaptation measures. The case municipality’s involvement with research projects related to climate change adaptation is thus an excellent example on the advantages of bridging this apparent gap, for better two-way communication and including the municipal officials in an early phase of the research. The role of the coordinator as a broker to encourage mutual learning process should thus be clear.

The above examples illustrate the central role of the engaged officials for setting climate change adaptation higher up on the municipality’s agenda in general and explicitly with certain construction projects. Furthermore, the engaged officials are also crucial with the co-production of knowledge between municipalities and research institutions. Considering that there are other, sometimes more urgent policy areas that differ from the climate change adaptation with impacts in the rather distant future, the role of engaged officials cannot thus be underestimated.

5.1.4. Implications of missing interface between climate change mitigation and adaptation

The national level strategies are focusing on climate change mitigation, therefore leaving both climate change adaptation and especially the linkage i.e. interface between mitigation and adaptation with less or without notice. In practice, this can also be seen in the case municipality. As has been already mentioned, at the moment there is only one person working full-time with climate change adaptation at the Environmental Unit (Miljøenheten). Even though climate change mitigation and adaptation are interrelated fields in practice, on the ground-level there is little communication between the people working within these two fields as revealed by the climate adaptation coordinator: *“we do sit here [in the same open office] and we do talk in coffee breaks etc. [...] but professionally we have nothing in common”*. As this is an exploratory study, the deeper reasons for the lack of communication will not be discussed in this thesis.

It became apparent from several interviews that the missing municipal holistic strategy is in practice causing challenges to certain municipal functions. One concrete example on how favoring climate change mitigation can hamper the climate change adaptation efforts is related to green shift. As the transport sector counts for a relatively high share on annual GHG emissions, the case municipality, in line with many other Norwegian municipalities, is setting emphasis on increasing the share of sustainable modes of transport such as bicycling. Yet, time to time, while constructing new bicycle lanes, the maintenance of them is not being taken into account early enough in the planning processes. In practice this can cause challenges to the maintenance team (Bydrift) if the vulnerability of the infrastructure to more frequent and severe storms, floods, and increased precipitation is not taken into account. The

coordinator pointed out this example and it illustrates well the consequences of the lack of interface and imbalance between climate change mitigation and adaptation in practice. This mismatch between mitigation and adaptation will be further discussed in Section 5.3 with more concrete examples from the case municipality.

The above-mentioned examples described and further addressed different approaches and strategies of the case municipality. These examples also hinted towards different factors that can ultimately affect the cross-sectoral collaboration with climate change adaptation. There are also other organizational constraints and environmental stressors that do affect the municipal approaches. These will be further explored in Section 5.3. The next Section (5.2) takes a deeper look into the cross-sectoral working group and offers the reader factors that affect the team processes and leadership, that again play an important part in succeeding with climate change adaptation.

5.2 Group processes - success factors, constraints and improvement potential

This section looks at the aspects that influence the cross-sectoral collaboration in the case municipality. The cross-sectoral working group for climate change adaptation can at its best work as a platform for experience and knowledge sharing. As will be seen, team processes and team leadership, i.e. coordination play an important part in succeeding with cross-sectoral issues such as climate change adaptation. Yet, in practice certain hindering factors can influence the collaboration negatively. Thus, by paying more attention to these immediate factors the cross-sectoral collaboration can potentially be improved. This Section is divided into the following three broad themes:

- Platform for collaborative governance
- Improvement potential
- Organizational constraints

The rich descriptions given in this section help mainly to answer research question 2: *What are the factors hindering and reinforcing cross-sectoral collaboration in climate change adaptation?*; and research question 3: *What can be done to improve cross-sectoral collaboration in climate change adaptation?* As mentioned, the research questions will be answered in greater detail in chapter 6.

5.2.1 Platform for knowledge exchange, knowledge creation and network building

The cross-sectoral working group offers a platform for collaborative governance. Furthermore, it creates social capital as different municipal departments and units can ultimately learn from each other on how to better integrate climate change adaptation into their daily practices and real-life problems. As it became apparent from the interviews, knowledge sharing on urban planning processes is of the utmost importance to different

municipal units in order to understand when there is actually a window for climate change adaptation. At its best, the working group creates new knowledge that can again be useful for climate-resilient planning in a municipal sector. Furthermore, the group also functions as a platform for network-building across different municipal sectors and units.

One of the central themes during the meetings have been maps and other visualization tools. The Map and Survey Unit (Kart og Oppmåling) that is responsible for municipal maps has an important role during the meetings, as the representatives from the Unit present different maps that are available either in the municipality itself or in relevant national institutions such as in the Norwegian Water Resources and Energy Directorate (NVE) and Geological Survey of Norway (NGU). Even though the role of the Map and Survey Unit is more informative, during the meetings the other group members have also been able to come up with input on what kinds of maps and visualization tools would be useful for them. *"[...] as a map person I have got quite a lot of wishes [from other group members] on how the data could be visualized and analyzed [...] scenarios on floods and sea-level rise for instance: I can take a flood-zone map from NVE and compare it to municipality's data on different buildings. By doing that we can see how many and what kinds of buildings can potentially be exposed to flooding. A lot can be analyzed by using maps [...]"*. This citation from the representative from the Maps and Survey unit demonstrates the usefulness and potential of the cross-sectoral working group in knowledge creation that can at its best lead to new planning tools (maps) that are beneficial to the municipality as a whole. These kinds of face-to-face meetings were also valuable to other informants who were not up-to-date on all of the possible planning tools that could be used.

As climate adaptation is an issue that touches many interrelated sectors, the meetings offer an arena for learning. One concrete example that has been highlighted by most of the interviewees is the more precise information on the municipal planning processes and knowledge on when there is a window for climate adaptation. This is how a representative from an urban planning office describes her contribution to the working group: *"[...] It is important to understand [the basics] on municipal planning processes in general, and in relation to the Planning and Building Act [...] and when there is a window for climate change adaptation in the zoning (reguleringsplan). This has been new to some of the participants of the working group."*. Thus, this kind of knowledge exchange between the sectors is important both to understand the interlinkages between the different sectors as well as laws, regulations, and planning processes and - most importantly - to take the valuable information back to real life and apply it.

As the case municipality is a rather big one in the Norwegian context, the experienced distance between different municipal units can be rather long. Thus, these kinds of cross-sectoral groups and meetings are seen as a good platform for learning, networking, and for getting closer contacts for further cooperation between and within different municipal

departments and units. As already mentioned, one also gets a good overview of what other departments are doing in relation to climate change adaptation, together with a better overall picture on municipal planning processes. Potentially, there will also be more engagement with climate change adaptation when there is a dedicated working group for it. It also became apparent from the interviews that it is relatively easy to take the gained knowledge and information back to their corresponding units and departments.

5.2.2 Improvement potential -finding the common grounds

Even though it is of utmost importance to realize what is currently working, in order to lift the collaborative teams to a new level, we also must acknowledge the potential for improvement. It became apparent from the interviews that the original purpose for establishing the cross-sectoral working group was to work with the climate change adaptation plan. Yet, from time to time the meeting agenda is quite extensive, covering a broad set of issues, some of them being, although interesting and therefore valued, less relevant to most of the participants. This is perceived as challenging, as the objectives and value of the meetings are not always clear, and furthermore follow-up activities are missing. It was suggested that there should be a more bottom-up approach when setting up the agenda for the meetings, starting from the needs and perspectives of different sectors.

Agendas with concrete problem statements and clear objectives that, as far as possible, are directly relevant for different municipal sectors are thus suggested. This hints at the need for a broad ownership to the climate adaptation process in the group as a whole and not only as a responsibility of personnel that are wholly dedicated to climate change adaptation processes.

Role of a facilitative leadership

Some of the working group members described the meetings as very informative with a broad focus. The case municipality and the coordinator are also actively involved in many external networks, alliances, and research projects related to climate change adaptation. This already became apparent in Section 5.1 as one of the strategies for climate change adaptation in the case municipalities is to cooperate with relevant partners and research institutions. Yet, conveying information about these external networks to the meeting agenda was found challenging to some of the participants since, even though informative and interesting, the actual value of getting information about these external networks is left unclear. Thus, sometimes the agenda is too broad: *"[...] there is a lot of orientation [on ongoing external networks]. It is cool to know about and interesting...but what shall I do with this information? I do understand that these [networks and alliances] are really interesting and relevant for Environmental Unit (Miljøenheten) but I [my department] am not participating in these [networks/alliances]"*. This quote illustrates the importance of the facilitative team leadership and clear scope that is crucial if one wants to succeed with the cross-sectoral teams. These kinds of quotes also hint towards negative coordination.

Effective coordination is a pre-requisite for effective collaboration. The role of coordination cannot be underestimated as it is ultimately the coordinator's responsibility to give concrete tasks to members of the working group. This is especially true in cases where participants have other, more urgent and mandatory tasks in their daily agendas. This was also highlighted by one of the group members: *"[...] if there is no one who asks me to do something, someone to give me a request, I won't follow-up. Why would I if no one asks [...] I have enough work to do on my own [...]"*. The lack of time and unclear role distribution was also highlighted by other respondents. Thus, measures such as specific assignments were also pointed out by another group member: *"[...] what could help me in the group? Concrete tasks. I feel that now I have a passive role in the group. I would wish for a clear message [from the coordinator] on what we [other group members] could prepare before the meetings [...]"*. Based on these viewpoints, it could be argued that the coordinating function is a sweet balance between the top-down and bottom-up approach.

Common problem definition

When asked for concrete improvements on how to improve the collaborative process, some participants came up with suggestions as *"[...]one could challenge the people [working group] to come up with concrete problem statements or presentations that relate to climate change adaptation[...]"* One suggestion from the representative from Municipal Engineers to enhance the collaboration was to discuss in the group common grounds and cases that the members could solve together. He suggested mapping both the common goals but also the goals that are not common. Few of the group members also stated that the discussed problems and cases should be as concrete as possible, with clear deadlines. This kind of more-facilitative leadership, or coordination, could help to tighten the bond between different sectoral silos and furthermore help to expand ownership of the climate change adaptation. These suggested solutions could also help to realize one of the case municipality's adaptation strategies, which emphasized the integration of climate change adaptation to all relevant municipal sectors.

Suggestions for concrete tasks

One suggested task with a clear deadline is to focus on finalizing the municipal climate change adaptation plan. To most of the participants, this was seen as an important and urgent goal for both the group and for the case municipality, and should thus be higher up in the agenda. Finalizing the plan was also the main reason for establishing the cross-sectoral working group and it is one of the main climate change adaptation strategies for the case municipality, as already stated in section 5.1.1. For many participants, focusing on the plan also gives meaning since, apart from being a concrete and a clear task, it also has a clear outcome - the plan itself.

As the case municipality has a large number of ongoing building projects, it would also be ideal to integrate climate change adaptation already in the planning phase. Yet, as became

apparent from some of the interviews, as the case municipality still has not experienced major extreme weather events, the adaptation, especially for the uncertain future climatic scenarios, is challenging. The previously mentioned example of the installation of the storm water management system (see Section 5.1.2) is a very good and descriptive example of how, even though the climate change adaptation is still not seen as an urgent issue that should be integrated in all the new construction or reconstruction sites, it can still succeed due to engaged municipal officials.

The current laws and regulations are static and non-flexible. The interview with Building Applications (Byggesak) revealed the urgent need for seeing different construction projects from the perspective of climate change adaptation. As it is at the moment, they (the Municipal Building Applications) are relying a lot on the Planning and Building Act, which is weak in this thematic area. Therefore, one of the wished-for topics was to set the focus on finding ways to set climate change adaptation higher up in the agenda of the initial phases of (re)construction projects. These kinds of very concrete problem statements that stem from an actual need could be also ideal for the cross-sectoral working group as, apart from being concrete, they can function as common goals where potentially all the group members can participate. Ultimately, these kinds of common problem statements that are solved together in these face-to-face meetings are also a perfect way to encourage further collaboration and moreover, create positive and continuous learning loops.

Having clear and concrete goals for the meetings and for the working group also helps to establish more definitive roles for each of the group members. Furthermore, having a more bottom-up approach can turn the group members from passive recipients of the information to more active participants of the group who can also have an input on the agenda. Thus agenda-setting and follow-up activities are important ingredients for well-functioning collaborative groups.

The power of informal face-to-face contacts

The benefits of creating an informal culture that evolves from interactions and social connections should not be underestimated. One very good example of how casual conversations can lead to actions was the previously-mentioned example on the ways two hydrologists initiated a storm-water management system after a casual chat by the coffee machine (see 5.1.2) This example is a perfect illustration on how informal face-to-face dialogue between two engaged officials with common interests and values can provide valuable outcomes, if the settings are right. Therefore, cultivating more informal relationships can be also seen as one of the building blocks of trust, and eventually a well-functioning team.

What this part of the case study shows, is that micro and team processes matter for the success of climate change adaptation measures. Climate change adaptation processes that cross organizational and sectoral boundaries are influenced by the success in creating

successful multidisciplinary and cross-sectoral teams. The attention given to such details should not be underestimated when designing the structures and processes of climate change adaptation. Nevertheless, there are also certain external constraints that can hinder the coordinating efforts, and these will be discussed in the following subsection.

5.2.3 Team properties or organizational constraints?

One of the challenges of the group has been the absence of people from the meetings. This has been noted by both the coordinator and some of the participants. The immediate fix for this problem at hand has been to re-organize the whole cross-sectoral working group. Nevertheless, there are some underlying factors related to the organizational constraints that, without paying also attention to these, fixing the immediate and more visible constraints might have little or no effect.

During the existence of the working group there have been many changes in the group's composition: people have been dropping out and new people have been joining in. There have also been absences from the group meetings, which is found disturbing as highlighted by one of the group members: *"[...] there has been a little continuity and sometimes we are just 2-3 people who meet up, some people do not meet up at all [...]"*. This has been described as frustrating and *"[...]not a big 'boost' for the motivation"*. The reasons for not prioritizing the working group can be related to many factors such as lack of time or motivation. Sometimes, unclear objectives, as already revealed in previous subsection 5.2.2, can also hinder the participation as pointed out by one of the participants: *"Why do I go to a meeting (in general)? It is because I will something. Either I will deliver something, or I will gain something for myself. If this [the value] is unclear to me, I do not show up."* Thus, unclarified objectives of the meetings, combined with the fact that all the group members have other, sometimes more urgent tasks to do can cause the meetings to be insufficiently prioritized.

Group dynamics and personal chemistry was also mentioned as a possible hindering factor for the absence from the meetings. As such, climate change and climate adaptation are also *"[...] controversial issues that require personal engagement"*, as one of the group members neatly summarized. This is definitely true with the case municipality that, as has been mentioned several times, still has not experienced extreme weather events that could get attention from politicians or local media.

As a direct reaction to the absence of people from the meetings, there has been a decision to re-organize the whole working group in order to, as the coordinator puts it *"[...] find even more dedicated people to the group"*. This decision to re-organize the group was made in cooperation with the coordinator and the management group. Yet, when asked how one becomes a dedicated person, the coordinator clarifies that *"[...]it also depends on what kind of working tasks one has. It is not that they [the group members] are not interested but do not have the time [...] so one has to have both interest and time to sit in the working group [...] it*

was a bit random who was thrown in [to the group].” Thus, a lack of capacity and resources can also be a hindering factor. According to the coordinator, having people in the group with climate change adaptation as a primary task can be seen as solution.

If a lack of capacity (time) is seen as a constraint for the members of the working group, it certainly is also a constraint for the coordinator. As it became apparent, the coordinator has a double function. In addition to her coordinating role among the different municipal sectors, the coordinator is also engaged with different external networks, alliances, and research projects both on the regional and national level. Furthermore, she is working as a mentor for surrounding, smaller municipalities. Her double role with both external and internal networks can also be seen as a hindering factor for the malfunctioning cross-sectoral working group. This is how she puts it: *“As it is at the moment, I have to work a lot with these external networks [...] so I can see that this is far too much for one person [...] therefore we should probably have one more coordinator, kind of like a “Foreign Minister and Minister of the Interior”* She goes on, pointing out that her role depends a lot on the available resources as *“[...] with more resources we can do a better job [...] with more resources we can perhaps also include the external actors [infrastructure owners, road and railroad administration] and at the same time coordinate in a better way we do at the moment.”* It became apparent later on that in theory it could be possible to hire more people to work with climate change adaptation. This need for more resources has already been discussed at the Environmental Unit.

As was pointed out in this section, constraints related to time, resources, and perceived usefulness of the work are powerful mechanisms that cannot be overlooked. It is thus clear that by only focusing on team properties, i.e. so-called horizontal factors that cross the different municipal sectors we do not get far. Management support and setting more available time and resources for the collaboration efforts is an important determinant. Also, different organizational factors, such as political climate, among others play a significant role if we want to improve the cross-sectoral collaboration in controversial and cross-sectoral issues such as climate change that are furthermore characterized by long-time horizons, uncertainty, and ambiguity. These underlying conditions and mechanisms will be explored in more detail in the following Section.

5.3 Underlying conditions and mechanisms

As already mentioned in previous Sections, certain organizational factors, such as national level priorities to climate change mitigation over adaptation, can also influence the cross-sectoral collaboration in climate change adaptation. This is directly reflected on the municipal level, as one of the most obvious reasons hindering the work of the working group was the lack of resources, dedicated time, and mandate. Furthermore, municipal culture can, with its sectoral silos, act as a hindering factor. As climate change is seen as a controversial theme, and as the current legislation does not make the climate change adaptation explicit, in practice this can lead to power imbalances and thus set more focus to issues driven by market forces.

The themes discussed in this Section are:

- Mandate and resources
- Municipal culture
- Effects of favoring climate change mitigation over adaptation
- Need for more sector specific legislation

This Section furthermore helps to answer the research questions in chapter 6.

5.3.1 Lack of mandate and resources

It became apparent from the interviews of the working group members, that sometimes the lack of follow-up activities was hindering further collaboration. Part of this can be explained by certain organizational constraints related to mandate and available resources. Previously mentioned municipal planning tools, e.g. maps (see Section 5.2.1) is a good example how lack of mandate can hinder the implementation process as pointed out by one of the working group members: “[..] I have understood that Maps and Survey Unit is waiting for a concrete order from the group.[...] the order has to be a bit more formal, it cannot just come from the [working] group [for climate change adaptation].” Thus, from time to time, the good intentions of the coordinator are hindered by a lack of mandate and resource asymmetries to take action and implement the decisions made during the meetings.

One of the fundamental reasons for the absence from the meetings was the lack of dedicated time and resources. As it is at the moment, only the coordinator has the climate change adaptation as a full-time job, and none of the working group members has climate change adaptation as their primary working task. In general, as pointed out by one of the group members: “[..] here [in municipal sector] it is so that people have a lot of other tasks to do. To prioritize something that has a long time-horizon can be a bit of a challenge.” As climate change adaptation is a voluntarily undertaking, setting priorities to mandatory issues is therefore understandable. Therefore, as suggested by the coordinator, when setting up a

working group, the members should also get enough dedicated time and mandate from their department leaders. Capacity, i.e. time, as already revealed in Section 5.2.2 was also a challenge to the coordinator and described by her as the key to do a better job.

5.3.2 Municipal culture with sectoral silos

Even though, and according to the coordinator, it is clear that with climate change adaptation one should work in across sectors in practice this has been challenging. One of the fundamental constraints can be found from the municipal culture with its sectoral silos. Thus, as also highlighted by a few of the informants, there is a lack of municipal culture - or experience - to work across the different sectors. This is a typical case for most of the Norwegian municipalities, as also highlighted by informants.

Regardless of the struggles the case municipality is experiencing with its cross-sectoral collaboration, it became apparent that, compared to many other Norwegian municipalities, they are in the fore-front as the coordinator puts it *"[...] there is no formula on how to do this correctly. The way we [the case municipality] work is new in Norway. If you would talk with other bigger cities, they are struggling with this [cross-sectoral collaboration in climate adaptation] as well [...] but as I already mentioned: climate change adaptation is such a special area that one has to work across the sectors."* As this is pioneering work, the coordinator and the case municipality are still looking for better ways and procedures to work with it. To change the municipal culture to be more open for cross-sectoral collaboration requires, as one of the informants puts it, *"more awareness [of the importance of cross-sectoral collaboration] and more management support."* This stems back to the conflicting objectives in higher governmental levels.

Yet, even though the working group is still in its infancy, the municipal culture, at least in the case municipality is slowly changing and opening, as experienced by the representative from the Map and Survey Unit: *"[...] we are becoming better in collaborating across sectors. As my boss says to me that we can contribute and help other departments with their jobs. Before we always talked about internal billing if we for instance helped the Environmental Unit with maps. But now the management says that we just help [...] it is more internal. It will not cost them anything. We are becoming much better to work across sectors. And that is positive development to a group like this."* Thus, even though the cross-sectoral collaboration can be rather rigid, especially in larger municipalities with longer distances between the sectors, the municipal culture is changing and the cross-sectoral working group can be seen as a perfect manifestation of the more open municipal culture.

Nevertheless, as has been already pointed out in this chapter, both national and municipal priorities are favoring climate change mitigation over adaptation. In practice this can hamper the adaptation efforts as seen in the following subsection.

5.3.3 Effects on favoring climate change mitigation to climate change adaptation

In spite of all the efforts to set more focus on climate change adaptation on the local level and within and between different municipal sectors, there is some fundamental constraints in society that set boundaries for the climate change adaptation. As revealed in Chapter 3 (context), national level priorities, legislation, and ultimately the political decisions set the framework conditions for the work of municipal sectors. As it is at the moment, the national priorities favor climate change mitigation over adaptation. This is also reflected in legislation and further into municipal level.

One practical example of how the focus on climate mitigation affects the adaptation efforts in the municipal level can be found from the current trend in favoring urban densification. This is how the representative (hydrologist) from the Municipal Engineers (Kommunalteknikk) describes the challenge: *“The plots where there used to be only one house are being re-build so that there is maybe four apartments in the same plot. In these cases, there will be completely different situation with the hard surfaces (asphalt), and with all the [rain]water that will be led to the drainage system [instead of permeable surfaces such as grass].”* Thus, as a consequence of urban densification, the sewerage system is sometimes working on its full capacity (see example from Norwegian sewerage system in Section 4.1.1)

One of the suggested solutions for the challenges mentioned above is, as brought up by the informant, to have an overall strategy that takes better into account the synergies between climate change mitigation and adaptation. This should ultimately be initiated on the national level. These findings show that pulling in climate change adaptation earlier in municipal planning processes is a concrete potential for improvement.

5.3.4 Climate change as a controversial theme - need for more sector specific legislation

As already stated several times, currently the emphasis on national legislation is on climate change mitigation - thus leaving climate change adaptation with less attention. Even though the deeper political reasons for the national emphasis are left out from this exploratory study, the consequences for the work of certain municipal sectors, mainly the Building Applications (Byggesak) that ultimately gives building permits to the developers are so significant that the issue requires further exploration.

As it became apparent with the interview of the representative from the Building Applications office, oftentimes the unclear legislation that does not explicitly mention and clarify climate change adaptation is problematic. This stems from an observation that it is in practice almost impossible to hinder certain construction projects that are overlooking the risks of the long-term effects of climate change. For the case municipality, such as for many other coastal cities, one of the long-term risks is sea-level rise. According to one of the informants, in a worst-case scenario, the sea-level rise combined with urban floods can led to severe consequences in certain relatively newly-built urban districts by the shoreline. Yet, as the

national legislation is not explicit enough, there is no legal mandate to hinder these kinds of construction projects as mentioned by a representative from the Building Applications: “[...] *in practice we cannot influence anything that is not mentioned in the Planning and Building Act [...] and the Act is very weak in this thematic area (climate change adaptation)*”. She goes on to explain how “[...] *these guidelines on climate change adaptation are really generic [...] regarding floods the guidelines do not mention whether it is today’s floods, or 100-year floods. They [guidelines] just talk about floods in general. If the guidelines would be more specific and for instance talk about 100-year floods, then we [Building Applications] could use them [the guidelines] in our cases.*”. Thus, it could be said that there is a need for more sector-specific legislation that would give the authorities a larger mandate, and that would also set more specific requirements for property developers. According to the representative from the Building Applications, they have previously faced dilemmas with certain new urban districts built on the waterfront that were built in spite of the evidence for 100-years flooding. Thus, without a very clear legal basis initiated from a national level, there is little that can be done in practice. Yet, as also mentioned by the informant, the visualization tools such as maps showing different scenarios are fundamental to illustrate the climate change related risks to developers.

In general, and as mentioned by the informant from Building Applications, the Norwegian municipalities have very little independent power and mandate when it comes to building regulations. Thus, developers have quite a lot of freedom in certain urban development projects. Additionally, as also pointed out by the informant, from time to time the short-term financial benefits to build on exposed areas are prioritized over the long-term and still unpredictable risks related to climate change. As pointed out by the informant, one of the potential ways the cross-sectoral working group could help her work directly is to get a better look into other legislations and guidelines.

These examples show that national priorities have a great effect on the municipal level, planning processes, and ultimately to the work that has to be made within different municipal sectors, particularly Building Applications. As the representative from the Municipal Engineers stated when asked for concrete improvements for changing this: “[...] *It is perhaps the overall way of thinking that is in the background [...] that has an effect for the ones who have to do the concrete work [in the municipality] [...] and that is a shame. It is there [in the sharp end] where one gets the more detailed focus (of the problems in hand)*”. This calls for a more bottom-up approach when setting up the national laws and regulations.

The rich descriptions of the case study evidence will be utilized in the next chapter, which discusses the findings of the case municipality and mirrors them through the lenses of the theoretical considerations. Here, the research questions are also answered.

6 Discussion

The initial problem formulation referred to the ways that climate change adaptation is dealt with on a municipal level and across sectors. This chapter discusses the findings from the case study through the previously-offered theoretical lenses. The chapter is divided into three Sections following the logic of the research questions. Section 6.1 shines light on the characteristics of different municipal strategies and approaches on climate change adaptation. Section 6.2 explores the factors that are either hindering or reinforcing the cross-sectoral collaboration in climate change adaptation. Herein, both underlying mechanisms and more direct factors are discussed in detail. Finally, Section 6.3 offers potentials for improvement in cross-sectoral collaboration.

6.1 Characteristics of the existing strategies and approaches

RQ1: What characterizes existing strategies and approaches to climate change adaptation in the case municipality?

National level priorities that emphasize climate change mitigation over adaptation are resonated to the municipal level in different ways. Laws, especially the Planning and Building Act, which is the central planning instrument for most municipal sectors, is currently not explicit enough regarding the potential long-term effects of climate change. The national level priorities also have an indirect influence on the amount of resources dedicated to climate change adaptation at the case municipality, as at the moment there is only one person working with climate adaptation at the Environmental Unit. The current lack of explicit legislation ultimately enables on the prioritization of short-term economic interests over issues characterized by long-term horizons, uncertainty, and ambiguity at the municipal level. Case study evidence showed that loopholes in legislation enables developers to oversee the long-term effects of climate change with certain construction projects.

Producing a climate change adaptation plan is one of the fundamental strategies for the case municipality, and the cross-sectoral working team was initially established for finalizing this plan. Yet, currently the case municipality does not have a holistic, overall strategy that could take into account both climate change mitigation and adaptation. The lack of this interface stems from a national level emphasis and has practical implications down to the municipal level. Favoring urban densification at the expense of surface water management can be seen as stemming from this lack of a holistic strategy.

These aspects hint towards asymmetries in power, resource, and knowledge, which is one of the variables mentioned in the model of collaborative governance by Ansell and Gash (2007). Furthermore, these findings can be reflected towards Rasmussen's model of multilevel governance (1997) that emphasized how certain environmental stressors, such as market

conditions and national level priorities, do resonate to the local municipal level and the ways decisions are made.

Despite a lack of clear signals from the national level that would emphasize climate change adaptation, the case municipality has taken steps to integrate climate change adaptation in different approaches. It can be argued that many of the municipal strategies have materialized through the efforts of the current coordinator. The coordinator has initiated the cross-sectoral working group for climate change adaptation. She has also played an active role in involving the municipality in national research projects in climate change adaptation. Cooperation with research organizations is also one of the central municipal strategies that, in addition to co-creation of knowledge on different adaptation measures, can be seen as an efficient way for enhancing the mutual learning process between municipalities and researchers. Thus, the coordinator can be seen as a broker between both different municipal sectors and between research institutions and municipality.

The case municipality still has not experienced extreme weather events that could force planners and decision-makers to set more emphasis on climate change adaptation. Therefore, the role of engaged officials is fundamental for bringing climate change adaptation higher up on the municipal agenda. Furthermore, the case municipality is one of the largest municipalities in Norway and therefore has sufficient institutional capacity to conduct such projects. According to Dannevig, Hovelsrud & Husabø (2013), this is one of the fundamental factors, along with engaged officials, that needs to be present to more highly emphasize climate change adaptation. Cooperation with research organizations as one of the central strategies is also characterized to be one of the most common factors that help to bring more attention to climate change adaptation at the municipal level. (Dannevig, Hovelsrud, & Husabø, 2013)

Case study evidence pointed out another, more pragmatic, example of the importance of engaged officials in implementing preventive climate change adaptation measures. As described in section 5.1.2, the installation of a storm-water management system in a newly-renovated public space was originally initiated by two hydrologists after they started to raise the issue during coffee breaks at work. This example can be seen through the lens of man-made disasters, and it demonstrates the importance of information flow (Turner & Pidgeon, 1997). Furthermore, this example from the case municipality proves the importance of professional competency for acknowledging the emerging risks of climate change (IRGC, 2017).

The way that the problems are framed affects the strategies and approaches used to solve them. (IRGC, 2017) Even though one of the municipal strategies is to collaborate with relevant partners, the current practices emphasize the collaboration between different municipal sectors. Thus, the municipality is seen more as an organization, not as a geographic area. As

it is at the moment, external stakeholders such as power companies are not yet included in the process. One of the explanatory factors for this is that the cross-sectoral working group is still in its infancy. Moreover, the apparent lack of resources has an effect on this. As a direct result of this, the climate change adaptation plan also emphasizes municipal sectors, leaving out for example power grids.

The establishment of the cross-sectoral working group is an excellent example of how emerging risks stemming from climate change should potentially be handled: collectively and across sectors. Since wicked problems caused by climate change are transboundary and there is no one definite formula on how to handle them, finding adequate solutions and ways to frame these problems should be done collectively across sectors and disciplines. (Rittel & Webber, 1973; Ostrom, 2010) Potentially, this cross-sectoral approach enables the municipality to see the problems and solutions from different perspectives. Furthermore, one of the characteristics of the current strategies is cooperation with research organizations, which enables easier access to external expertise that will contribute to expanding the knowledge-base. (Dannevig, Hovelsrud, & Husabø, 2013; Rasmussen, 1997; IRGC, 2017) In this matter, the importance of local level networks can, again, not be overstated.

One of the Norwegian guiding principles of societal safety is related to the importance of collaboration. Furthermore, based on the principle of proximity, the municipalities can be seen as the lowest possible governmental level in Norway. Municipalities can thus be seen as the cornerstone for both civil protection and for climate change adaptation. (DSB, 2018) Having these two principles in mind, I would argue that the case municipality's approach for establishing a cross-sectoral working group for climate change adaptation can be seen as a good manifestation of how to apply these two principles of societal safety in practise.

6.2 Hindering and reinforcing factors

RQ2: What are the factors hindering or reinforcing cross-sectoral collaboration in climate change adaptation?

The variables presented in Ansell and Gash's model of collaborative governance (see section 4.4.2) are used as a vantage point to discuss the main factors either hindering or reinforcing cross-sectoral governance in the case municipality. The table in Appendix B synthesized the knowledge gained from the case study in relation to both the model of collaborative governance and wider theoretical considerations. Even though the core of the model is the collaborative process itself, there are many variables that should be acknowledged in order to fully understand the factors that affect the cross-sectoral collaboration.

The underlying mechanisms, i.e. *starting conditions*, create frames for the collaborative process itself. Subsection 6.1 hinted towards *power, resource, and knowledge asymmetries* that are, at least in some degree, present in the case municipality. The imbalance in resource

distribution between climate change mitigation and adaptation has an indirect effect on the process itself, as the lack of resources, i.e. time, can prevent some of the participants from attending the meetings. Knowledge sharing is especially important with wicked problems that are transboundary. (Rittel & Webber, 1973) Ansell and Gash (2007) do not mention research organizations in their model of collaborative governance. Yet, it is important to realize the role of research organizations in decreasing knowledge asymmetries, and in enhancing the competence and knowledge about the risks. (IRGC, 2017) As the case municipality, including the current coordinator, is involved in several research projects and networks regarding climate change adaptation, this works as a reinforcing factor for the cross-sectoral collaboration.

In general, asymmetries in power, resource, and knowledge distribution can work as a powerful incentive to participate to collaborative forums, such as the case municipality's working group. (Ansell & Gash, 2007) The precondition to this is that the stakeholders acknowledge the importance, and see the benefits, to work across sectors. Yet, as also stated by Almklov et al. (2017, p. 2), this can be rather challenging in a "*silo-based public sector*" where cultural boundaries between groups are traditionally known to be long. Yet, the case study municipality has started to acknowledge the importance of working across sectors. This acknowledgement stems from a management decision. As the importance of local collective action with wicked problems, such as the ones related to the climate change, cannot be highlighted too much, this observation from the case study municipality can be seen as the first step for decreasing these cultural boundaries. (Ostrom, 2010; Dannevig, Hovelsrud, & Husabø, 2013; Rittel & Webber, 1973; Almklov et al., 2017) Case study evidence showed that the lack of a holistic strategy, i.e. missing interface between climate change mitigation and adaptation, was also an incentive to participate in these kinds of collaborative forums. This is especially the case with the participants who realize the interdependencies between mitigation and adaptation measures.

Case study evidence showed that the current coordinator is engaged with her work. Apart from being the initiator for the cross-sectoral working group, her efforts are also manifested through enhancing the mutual learning process between municipalities and researchers. Dialogue is at the heart of collaboration (Ansell & Gash, 2007; Ostrom, 2010; IRGC, 2017) . Therefore, the efforts and initiatives of the current coordinator to create communication platforms, e.g. the cross-sectoral working team in climate change adaptation, and to improve the information exchange between municipalities and research organizations, is vastly important. She furthermore played a great role in establishing her position as the first climate change adaptation coordinator at the case municipality. Highlighted by both coordinator as well as Ansell and Gash (2007), using coordinators that work in the municipality and thus know the municipal culture is better than using external mediators. As initially the incentives for participating in the cross-sectoral process are low, this coordination has a vastly important role for increasing these incentives. (Ansell & Gash, 2007)The efforts of the coordinator are

therefore crucial to both increase the interdependencies and decrease the cultural boundaries between different municipal sectors. (Almklov et al., 2017; Ansell & Gash, 2007)

Yet, in the case municipality weak instruments, i.e. the lack of a coordinator's mandate, combined with excess amounts of work is hindering her ability to focus fully on the cross-sectoral team. Due to these resource limitations and weak instruments, there are some challenges in coordination that materialize by lack of follow-up activities, and by having overly broad meeting agendas. Fimreite et al. (2014a) refer this as a negative coordination.

Creating meeting spaces for face-to-face contacts is important as it contributes to two-way communication. Dialogue between different stakeholders helps to achieve mutual understanding and understand each other's perspectives in a new light. Ostrom (2010) also highlighted the importance of these kinds of learning platforms. According to the working group members, these kinds of meetings where different professionals meet up are valued on their own. The case municipality's cross-sectoral working group is an important platform to enhance these personal networks and to gain more knowledge, for example on planning processes in the case municipality. As also stated by Almklov et al. (2017), personal networks are valuable assets to decrease cultural boundaries between different sectors. Even though Ansell and Gash (2007) point out that the vantage point for the meetings are usually distrust, I would highlight that since the theme of the meetings, climate change adaptation, was known to be common denominator to most of the participants, the level of initial trust was therefore relatively high.

As stated by Ansell and Gash (2007), having a clear scope and deadlines increases the *legitimacy* of the process itself. The initial purpose for establishing the group was to work with the climate change adaptation plan. Yet, as it is at the moment, there is also other, what Ansell and Gash refer to as "*intermediate outcomes*" that can help to increase the legitimacy of the process itself. A practical example of these intermediate outcomes is the co-creation of visualization tools, i.e. maps. Co-creating these kinds of pragmatic and innovative solutions where different areas of expertise can be utilized, increases the mutual recognition of interdependency. (Ansell & Gash, 2007; Ostrom, 2010) As its best, these kinds of intermediate outcomes that enhance commitment can help to decrease the cultural boundaries between different municipal sectors (Almklov et al., 2017).

6.3 Improvement potential

RQ3: What can be done to improve cross-sectoral collaboration in climate change adaptation?

The role of facilitative coordination to success with cross-sectoral collaborative is of the utmost importance. (Ansell & Gash, 2007) With its current work load combined with a lack of resources, the working group cannot work at its full potential. Therefore, it is recommended to have two coordinators, as highlighted by the current climate change adaptation coordinator. Having two coordinators was also highlighted by Ansell and Gash's model as one of the measures to improve the process (2007) As she points out herself, this could strengthen the cross-sectoral working group as one of the coordinators could set the focus on managing the group, whereas the other one could focus on the external networks, alliances, and research projects. A team of two coordinators would strengthen the process, as with more resources the full potential of the knowledge gained from research organizations and external networks could be better digested and filtered to the actual needs of the cross-sectoral working group. Apart from having more resources, the need for more mandate also became apparent.

Yet, it would be naïve to claim that merely having more instruments, i.e. mandate and more resources for the coordinator would be enough to improve the cross-sectoral collaboration in such wicked issues as climate change adaptation. I base my argument on the previous Norwegian studies of Almklov et al. (2017) and Fimreite et al (2014b) that both emphasize how collaboration in the rather strong and independent silo-based public sector is weak. The study by Lango, Lagreid and Rykkja (2014) furthermore realized that the weak instruments, i.e. lack of mandate and authority, are characteristic in some Norwegian Departments in ministerial level who supposed to have the coordinating role of societal safety. The findings of Lango, Lagreid and Rykkja (2014) are also applicable to the case municipality's Environmental Unit, where the coordination in climate change adaptation is ultimately takes place.

Nevertheless, there are some important findings that we can take from local collective actions. The case municipality's cross-sectoral working group is a perfect manifestation of how wicked problems should be handled: locally and across sectors. This approach can be also mirrored against the two Norwegian principles of societal safety: *proximity and collaboration*, that are both central in this thesis (DSB, 2018). Therefore, as also stated by Almklov et al. setting more focus on these kinds of "*boundary processes*" (2017, p. 2), i.e. what I understand as the collaborative process, is important if we want to improve cross-sectoral collaboration. Consequently, the improvement measures should be dedicated to the collaborative process itself.

As all the working group members have other, sometimes more urgent tasks to do than engaging with the working group activities, it is of the utmost importance to increase the perceived value and usefulness of the cross-sectoral working group in general and meetings in particular. Case study evidence showed that commitment to the process is one single factor that, by improving we can strengthen the collaborative process itself. Commitment is closely

related to the motivation to participate in these meetings. Therefore, we need to find the ways to create more incentives for participation. Focusing on different means for improving the commitment to the collaborative process itself broadens the perceived ownership (Ansell & Gash, 2007; Ostrom, 2010)

Concrete, actual, and focused problem statements and objectives that are directly relevant for the municipal sectors are needed. Co-creation of the visualization tools, i.e. maps, is an excellent example on the ways that that can benefit many of the municipal sectors. One of the group members wished for more of these kinds of smaller projects that the group members could collectively do together. As also highlighted by the group members, there should be more regular meetings and follow-up activities after the meetings. Concrete tasks that could enhance two-way communication during the meetings and thus increase the motivation to participate was one of the wished-for possible improvements mentioned by the group members. As the original purpose of establishing the cross-sectoral working group was to finalize the climate change adaptation plan, having the plan itself as a concrete task during the meetings was experienced important and should be prioritized during the meetings.

As one of the key motivators for most of the group members was initially related to the climate change adaptation plan, it is thus recommended to set more focus on this plan. Advantages for collectively focusing on the plan is also related to shared ownership. (Ansell & Gash, 2007) This can potentially widen the perceived ownership of climate change adaptation in general. This is of the utmost importance since the climate change touches many sectors and ultimately the case municipality's climate change adaptation plan should be both produced and implemented across sectors. I argue that this would also increase the interdependencies between different sectors in general, not just in relation to this specific group. This could furthermore help to decrease the cultural boundaries in a silo-based public sector (Dannevig, Hovelsrud, & Husabø, 2013).

The table in Appendix B includes more detailed suggestions for improvement potentials.

7 Conclusion and perspective

This chapter offers concluding remarks Section 7.1. The suggestions for further work based on the findings from this study are also offered in Section 7.2.

7.1 Concluding remarks

The title of this thesis - *“Breaking the silence between silos - exploring collaborative governance in climate change adaptation”* - already hinted towards the importance of collective action. Even though the main emphasis in this thesis has been on *local* collective action, the study also revealed some fundamental mechanisms that do have an effect on the ways that climate change adaptation is dealt with on a municipal level. As Rittel & Webber (1973) also highlighted, wicked problems need to be solved on multiple levels. This adds up to the complexity of the problems caused by climate change - and to the ways and means to solve these challenges. The model of collaborative governance utilized in this thesis emphasized the importance of *communication* being *“at the heart of collaboration”* (Ansell & Gash, 2007, p. 558). Even though Ansell and Gash emphasized the *horizontal* communication and collaboration, also communication within the silos - or different vertical levels - is important in order to fully understand all the possible nuances and conflicting objectives affecting the collaborative process itself. (Rasmussen, 1997) To explore more on different approaches to brake this *silence between* and *within the silos* screams for further studies.

7.2 Ways forward

This thesis used interviews as the main method to gain insights on the ways that climate change adaptation is dealt with across different sectors. Ansell and Gash (2007) argue that there is need for more ethnographic research to open up all the nuances to gain a deeper understanding, and ultimately improve and raise, the collaborative process. Research by Almklov et al. (2017) also supports the need for more meso-level research on cross-sectoral collaborations in Norway. As climate change adaptation is going to be lifted higher up in the national agenda in Norway (as of 2019), this would offer a great opportunity for longitudinal case studies to study the effects of changing framework conditions on the collaborative process itself.

Potentially, the case municipality and the cross-sectoral working group used in this thesis could offer a perfect learning platform and a test ground to see the effects of different measures that can be applied to improve collaborative capabilities. One of these concrete measures was to use two coordinators, as suggested by both Ansell and Gash (2007) and also desired by the current climate change adaptation coordinator of the case municipality. Furthermore, as highlighted by Ansell and Gash (2007, p. 562) *“[...] case study research into trust building, the development of shared understanding, and commitment formation would be particularly valuable.”* Thus, there are several avenues of investigation to focus on.

Concluding remarks

This master thesis has been a culmination of several years of intense work and studies at the Norwegian University of Science and Technology. Even though the learning curve has not always been linear, but rather complex and most definitely iterative, the process itself has given me a lot - both in a professional, but also on a personal level. Looking at the whole process with a bird's-eye view, this master thesis in the field of Safety Management has furthermore enabled me to apply and combine the previously-acquired knowledge from my earlier two university degrees: practice-based Environmental Management and Engineering from Tampere University of Applied Sciences, Finland, and project-based Urban Planning and Management degree from Aalborg University, Denmark. It is only now that I am able to realize the true value and full potential of all the inter-disciplinary knowledge that I have gained throughout my studies.

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Appendix A Interview guide

Background

- Can you tell me about yourself? How long have you been working at [...] municipality?
- What is your background?
- Can you tell me about your work?
- Can you tell me about your role in the cross-sectoral working group for climate change adaptation?

Mapping of different stakeholders and sectors (related to the municipality's climate change adaptation)

- Can you tell me about all these stakeholders? Why it is important to have all these stakeholders and sectors involved in the climate change adaptation at the [...] municipality?
- Who are the most central sectors/stakeholders in regards to climate change adaptation in [...] municipality?
- Is there some central sectors/stakeholders that are missing from the picture?

Collaboration between different sectors and actors

- Can you tell me about the collaboration between different municipal units/sectors? How is the collaboration in practise?
- What reinforces or hinders the collaboration between different actors/sectors?
- Has there been any changes on the way you collaborate after you become a member of the cross-sectoral working group?
- Any cultural differences between different sectors/units/actors? Is it easier to collaborate some other sectors than others?

Climate change adaptation plan

- What are the central actors/sectors that are working with the climate change adaptation plan?
- Is there going to be new actors/sectors involved in the cross-sectoral working group for climate change adaptation?
- Can you tell me about the climate change adaptation plan? How is the process? Who is writing it? What are the most important measures that could improve the cross-sectoral collaboration in climate change adaptation?
- What could help you the most as a member of a group/coordinator?

Further work and summing up

- I will conduct interviews with most of the people who are involved in the cross-sectoral working group for climate change adaptation. Do you have suggestions for some other people I should interview? How about actors who are not in the network?
- Is there anyone else who is working with climate change adaptation at [...] municipality? Who?

Why/Why not? What do you mean by that? What are the reasons that...? Can you tell me a bit more about...? Do i Understand it right when you say that...? Can you specify? Can you give me details on...? Can you give me examples of...? How do you see that in practise...? How do you experience that...?

Appendix B -Synthesis of case study evidence and theoretical considerations

Theoretical Considerations

Model of Collaborative Governance /

Starting Conditions: Power-Resource-Knowledge Asymmetries

Political climate. National level priorities affecting laws and regulations that eventually resonate and have implications to the local level.

Lack of management support and organizational infrastructure.

Emphasis on short-term financial criteria over issues characterized with high uncertainty and long time-horizon.

Source: Ansell & Gash (2007)

Wider Theoretical Considerations

Relating to Power-Resource-Knowledge Asymmetries

Conflicting objectives in decision-making with short-term economic benefits and long term uncertainties relating to climate change. National level priorities set boundaries for the lower levels of governance. Environmental stressors, i.e. national level priorities and current market conditions.

Man-made disasters and (biases in) information flow together with misperceptions among decision-makers. Cumulating and cascading effects, synergies, emerging interactions and systemic dependencies. Importance of local level networks/ local collective action in acknowledging the emerging risks and finding solutions to handle them. Characteristics of the wicked problems, e.g. transboundary, challenging to define, lack of competence and knowledge about the effects of climate change. Involvement of researchers/involvement in research projects to get access to knowledge and external expertise. Vertical governance structures & sometimes governance structures are designed at the single level.

Challenges of establishing strong coordinating body to handle complex issues that should be handled across sectors between strong ministries.

Negative coordination.

Sources: Dannevig et al. (2013), Rasmussen (1997), Turner & Pidgeon (1997), Renn (2014), Rosness et al. (2010), Fimreite et al.(2014)

Relation to the case study evidence

Root causes: National level priorities in climate change mitigation over adaptation. Missing interface between climate change mitigation and adaptation.

Implications to municipal level: Lack of interface resonates to municipal planning processes, e.g. conflict between urban densification & surface water treatment. Increasing the share of sustainable transport modes by building more bicycle lanes without paying enough attention to maintenance in changing climate, is characteristic in a case municipality. Resource imbalance between climate change mitigation and adaptation at the case municipality's Environmental Unit. Lack of instruments, i.e. mandate to implement the decisions made in the cross-sectoral working group, i.e. maps and other visualization tools/planning instruments

Improvement potential: Better acknowledgement of the interface between climate change mitigation and adaptation at the municipal level. (National guidelines change as from 2019 leading to better acknowledging climate change adaptation). Acknowledging the importance of climate change adaptation in general.

Root causes: Lack of national focus to climate change adaptation affects the laws and regulations. Planning and Building Act is not explicit enough regarding sea-level rise. The Act sets the emphasis on extreme weather events, leaving less specific emphasis to more gradual changes and long-term effects of climate change.

Implications to municipal level: Building Applications (Byggesak) that are heavily dependent on legislation (especially Planning and Building Act) do not have the mandate to hinder developers to build on areas that are posed to more long-term and gradual effects of climate change. Holistic planning that takes into account climate change mitigation and adaptation is dependent on individual efforts.

Improvement potential: More specific national legislation (especially Planning and Building Act). More holistic planning. Bottom-up approach starting from the needs of municipalities and municipal sectors

Best practice example: Municipal planning instruments, i.e. maps and visualization tools (currently waiting to be implemented) can help the Building Applications to illustrate the long-term effects of climate change to developers.

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Theoretical Considerations

Model of Collaborative Governance /

Starting Conditions: Incentives for and Constrains for Participation

Stemming from power and resource imbalance. Stakeholder's acknowledgement of their participatory efforts to the actual outcomes. Influenced by possibility to achieve the goals through alternative means and by whether the achievement of the outcomes/goals are dependent on cooperation. Collaborative process itself can be seen as incentive if seen as an exclusive forum for decision-making and if cooperation is seen as a prerequisite for achievement of the goals.

Source: Ansell & Gash (2007)

Wider Theoretical Considerations

Relating to Incentives for and Constrains for Participation

Importance of collective action in wicked problems, e.g. due to unclear boundaries of ownership. Real-world indicators & extreme weather events (acknowledgement). Framing the problem. The unspecified legislation stemming from national level priorities. Weak instruments i.e. lack mandate and authority. Cultural differentiation i.e. cultural boundaries. One of the Norwegian societal safety principles, that of collaboration, does not specify in which governmental level the collaboration should take place. Weak coordination between different sectors. Dilemmas between coordination and responsibility. Involvement in research projects.

Sources: Ostrom (2010), Dannevig et al. (2013), IRGC (2017), Fimreite et al. (2014a), Fimreite et al. (2014b), Almklov et al. (2017)

Relation to the case study evidence

Root causes: Municipal culture with sectoral silos. Little or no experience to work across municipal sectors.

Improvement potential: More awareness needed for the importance of cross-sectoral collaboration. More management support.

Best practice example: The case municipality's cross-sectoral working group. Municipal culture slowly opening up to collaboration across different sectors and municipal units. The cross-sectoral working group can be seen as a pioneering group to work across municipal sectors

The case municipality is involved in a national research project in climate change adaptation. Yet, it became apparent that even though beneficial to the case municipality, the research is not solution-oriented enough from the perspective of municipalities.

Improvement potential: To bridge the gap, better communication between the municipalities and research organizations is needed in early phases of the research project. This entails the co-production of knowledge.

Root causes: Missing interface between climate change mitigation and adaptation. Climate change adaptation has a long-time horizon

Implications to municipal level: Lack of interface resonates to the lower level of governance and potentially affects the cross-sectoral collaboration. Currently most of the adaptation measures are voluntary undertakings. Lack of incentives to participate.

Continues...

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Theoretical Considerations

Model of Collaborative Governance /

Starting Conditions: Prehistory of Cooperation or Conflict

Influences the incentives for collaborative governance in cases where interdependencies are high and acknowledged. Initial level of trust, and social capital has an effect to commitment, and communication and thus collaborative process itself. *Source: Ansell & Gash (2007)*

Wider Theoretical Considerations

Relating to Prehistory of Cooperation or Conflict

Man-made disasters and the information flow. Importance of collective actions, The value of local knowledge and personal networks. Cultural differentiation i.e. cultural boundaries between different groups and organizations that are characterized by conflicting interests and objectives. These cultural boundaries are argued to be explanatory factors in challenges within cross-sectoral collaborations and coordination.

*Sources: Turner and Pidgeon (1997), Ostrom (2010)
Almklov et al. (2017)*

Relation to the case study evidence

Observation: Conflicts between climate change mitigation and adaptation can create incentives to collaborate in cases where the interdependencies between mitigation and adaptation measures are acknowledged. Thus, the lacking interface, i.e. conflict, between mitigation and adaptation can work as a powerful mechanism for cooperation.

Continues...

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| Theoretical Considerations | Relation to the case study evidence |
|--|--|
| <p>Model of Collaborative Governance / Facilitative Leadership or Coordination Setting and maintaining clear ground rules, building trust, facilitating dialogue and exploring mutual gains. Stimulate creativity by synthesizing the knowledge of diverse participants so the group can create new ideas and understandings. Leadership/Coordination is utmost important if incentives to collaborate are low and power is asymmetrical. Organic (internal) coordinators instead of external mediators are preferred. Coordinator as a broker. Using multiply leaders/coordinators can be justified. <i>Source: Ansell & Gash (2007)</i></p> <p>Wider Theoretical Considerations Relating to Facilitative Leadership or Coordination Facilitating leadership encourages two-way communication instead of one-way information that ensures building a dialogue and affects the level of trust. The role of coordinator in local collective actions that are created by informal networks, establishing learning platform and meeting places encourages face-to-face discussions, achievement of mutual understanding and trust building. The role of engaged officials is crucial for adding up climate change adaptation into municipal agenda. This role should not be seen in isolation from the institutional capacity i.e. resources. Involvement to research projects related to climate change adaptation is often due to engaged officials. The coordinator as a broker between different municipal sectors, and between research organizations and municipalities. In Norway, coordination is experienced weak between rather strong and independent sectors (in higher levels of governance). Negative coordination, i.e. focus on issues outside the responsibility and interests of other stakeholders, lack of follow-up activities. Weak instruments, i.e. lack of mandate and authority for disposition, can hinder coordination efforts. Cultural differentiation, i.e. cultural boundaries between different groups, affects cross-sectoral collaboration and coordination. These cultural boundaries are characterized by conflicting interests and objectives. Decreasing these boundaries are found to be one of the best cures for better collaboration and coordination. Local networks, personal networks, and informal structures make collaboration and coordination easier. <i>Sources: IRGC (2008), Ostrom (2010), Dannevig (2013), Fimreite et al. (2014a), Almklov et.al (2017)</i></p> | <p>Drivers: Coordinator as an initiator for the cross-sectoral working group. The position of the coordinator was initiated by the coordinator herself. Coordinator is working at the municipality's Environmental Unit thus she is internal for the municipality. Coordinator is involved with many research projects relating to climate change adaptation. Coordinator as a broker to encourage mutual learning process, co-production of knowledge between municipalities and research organizations.</p> <p>Barriers: Weak instruments, i.e. lack of mandate for disposition. Negative coordination i.e. lack follow-up activities, agenda setting. The negative coordination can stem from a lack of resources, i.e. currently the coordinator works with many other projects and is the only one working with climate change adaptation at the Environmental Unit. Lack of resources (time) and mandate for implementing decisions made during the meetings. Pioneering work with the cross-sectoral working teams.</p> <p>Improvement potential: Agenda setting and the role of coordinator: more bottom-up approach starting from the needs and perspectives of different sectors involved in the cross-sectoral working group; concrete problem statements; better follow-up activities. More facilitative coordination that can help to tighten the bond between different sectors and expand the ownership of the climate change adaptation. Need for more management support (mandate), resources, and capacity. Having two coordinators is justified.</p> |

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Theoretical Considerations

Model of Collaborative Governance / Institutional Design

Institutional design refers to both basic protocols, and ground rules for collaboration. These are important for the procedural legitimacy of the collaborative process itself. Optimally wide range of stakeholders should be included to increase the legitimacy of the process. Importance of framing the problem, with relevant stakeholders. Importance of transparent and clear process. To increase the legitimacy, clear scope and deadlines needed.

Source: Ansell & Gash (2007)

Wider Theoretical Considerations Relating to Institutional Design

Defining the risk and framing the problem is especially important with emerging risks which, by nature include broad set of stakeholders. Appropriate level of stakeholder involvement is important. Selection of overly inclusive process leads to inertia or indecision. Involvement of researchers to ensure appropriate knowledge-base. Identification of relevant stakeholders is crucial. Unclear responsibilities between different sectors since the work and responsibility are spread over many sectors in different organizational levels.

Sources: IRGC (2008), Fimreite et al. (2014)

Relation to the case study evidence

Characteristics: *Scope: Municipality is seen as an organization, not as a geographic area. Stemming from this, stakeholders are from within the different municipal sectors. External stakeholders are not included to the cross-sectoral working group.*

Drivers: *In some meetings scope has been clear, i.e. focus on creating new municipal planning tools (maps); getting more knowledge on municipal planning processes. Group members experience this motivating and useful from their perspectives.*

Barriers: *Unclear scope and lack of deadlines. Unclear role distribution, lack of concrete tasks.*

Improvement potential: *Defining the scope, i.e. focusing on finalizing the municipal climate change adaptation plan. Clear deadlines and more concrete problem statements stemming from the actual needs.*

Theoretical Considerations

Model of Collaborative Governance /

Collaborative Process: face-to-face dialogue and trust-building

Communication, i.e. face-to-face discussions, are at the heart of collaboration. Face-to-face dialogue is necessary, but not sufficient condition to success with collaboration. It helps to break down stereotypes and other barriers to communication that prevent exploration of mutual gains at the first place. Importance of trust-building, shared understanding and commitment. Trust-building stems from an observation that oftentimes the starting point for communication is lack of trust. This relates to prehistory of conflict. Cultivating trust and the role of facilitative leadership.

Source: Ansell & Gash (2007)

Wider Theoretical Considerations

Relating to face-to-face dialogue and trust building

Two-way communication, i.e. dialogue, instead of one-way information. Communication affects the level of trust. The importance to set the focus on processes through which information is disseminated, combined and interpreted. Creating meeting spaces is important as it encourages face-to-face discussions and thus achievement of mutual understanding and especially trust-building. The settings where different people from different sectors can meet up tend to enhance innovation, mutual learning, adaptation, trustworthiness, levels of cooperation and the achievement of more effective, equitable and sustainable outcomes. Facilitating collaborations and social learning through informal networks. Informal structures make the collaboration easier than formal structures.

*Sources: IRGC (2008), Rosness et al. (2010), Ostrom (2010)
Almklov et al. (2017)*

Relation to the case study evidence

Drivers: Cross-sectoral working group as platform for knowledge exchange, knowledge creation and network building. Learning platform and meeting place for different municipal officials. Platform for getting closer contacts for further cooperation

Barriers: Lack of clear and concrete goals, and group members lack of acknowledging the value can hinder people to participate to the meetings. People dropping off from the cross-sectoral group, absence of people, new participants. Agenda setting: meetings are experienced informative, but group members highlighted that sometimes two-way communication missing.

Best practice example: Installation of storm-water management system is a good example on how informal face-to-face conversations between two municipal officials that are committed to their field of expertise (hydrology) eventually led to setting more emphasis to climate change adaptation measures.

Improvement potential: Cultivating more informal relationships. This can be realized by for example focusing on common goals (see intermediate outcomes)

Theoretical Considerations

Model of Collaborative Governance /

Collaborative Process: Commitment to process

Weak commitment from a management can resonate to lower levels. The original purpose, or motivation for the collaborative process is closely related to the commitment. Motivators: to ensure that one's perspective is being heard, to secure legitimacy. Shared ownership of the process is related to the commitment. The feeling of ownership goes hand in hand with commitment and shared responsibility. Co-dependency between ownership and responsibility are closely related to mutual recognition of interdependency. Openness to explore mutual gains.

Source: Ansell & Gash (2007)

Wider Theoretical Considerations

Relating to commitment to process

Importance of management commitment and support. Eventually national level priorities set the framework conditions and affects the level of commitment. Engaged administrative employees and interested in the consequences of climate change. Learning from different perspectives and co-create innovative solutions. In Norway: relatively independent sectors with cultural boundaries between the sectors. Decreasing the cultural boundaries can be seen as one of the cures for better collaboration. Different sectors are influenced by different frames of reference, areas of expertise and language.

Sources: Rasmussen (2007), Dannevig (2013), Ostrom (2010)

Fimreite et al. (2014b), Almklov et al. (2017)

Relation to the case study evidence

Drivers: Strong commitment of the coordinator to the climate change adaptation. As such the working group is a good platform for recognizing interdependencies.

Barriers: Commitment to the process can be hampered with too broad and extensive meeting agenda that does not have a direct value for the participants. Unclear role distribution. Original purpose of establishing the cross-sectoral working group was to work with the climate change adaptation plan. It is experienced that the focus has not been in the plan but in other issues

Best practice example: Co-creating planning tools, i.e. maps and other visualization tools where knowledge from different sectors can be synthesized. This kind of knowledge creation can as its best enhance commitment to the collaborative process itself.

Improvement potential: Need for broader ownership to the climate change adaptation process. To improve the shared ownership of the process, it is recommended to have more bottom-up approach, starting from the needs of the different participants; exploring mutual gains by mapping what is common and what is not; and by setting emphasis for finding real-life problem statements group members can solve together. This can also help to turn some of the group members from passive recipients of information into more active participants of the group. Setting the focus to the original purpose of the group: to finalize the climate change adaptation plan.

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| Theoretical Considerations | Relation to the case study evidence |
|--|--|
| <p>Model of Collaborative Governance / Collaborative Process: Shared understanding Shared understanding of the clear purpose and defining scope that is possible to achieve together. Common agreement on the knowledge that is needed to address the problem. Access to the knowledge-base. <i>Source: Ansell & Gash (2007)</i></p> <p>Wider Theoretical Considerations Relating to shared understanding Shared understanding of the risk, common problem recognition and framing the problem. Defining the boundaries of the risk. At the municipal level this is usually the geographic boundaries or municipality as an organization. Finding out different options for preventing, mitigating or adapting to the risk. Wicked problems relating to climate change can be framed in many different ways, there is no common formula. For wicked problems there is no definite solution that could be either true or false. The solutions to wicked problems are only better or worse depending on the interests and values. Collective decision making can also enhance the shared understanding by learning from each other's perspectives. Cultural differentiation i.e. cultural boundaries between different groups. These cultural boundaries are characterized by conflicting interests and objectives. Social learning and meetings as learning platform. <i>Sources: IRGC (2008), Rittel and Weber (1973), Ostrom (2010), Almklov et al. (2017)</i></p> | <p>Drivers: A platform for learning for instance about municipal planning processes. Information and knowledge sharing Barriers: Top-down agenda setting, extensive meeting agenda, danger for diluted process. Unclear scope and value of the meetings. Improvement potential: Setting clear focus. Common problem definition. Mapping the needs, more bottom-up approach.</p> |

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Theoretical Considerations

Model of Collaborative Governance /

Collaborative Process: Intermediate outcomes & actual outcomes

Intermediate outcomes are concrete and small results from the process itself. These are important for building the momentum that can enhance the collaboration even more and make it more successful. These are also referred as “small-wins” and can be for instance common fact finding. These intermediate outcomes are important to deepen the trust, commitment and shared understanding. Ultimately the whole collaborative process should lead to concrete outcomes that are beneficial to the society as a whole.

Source: Ansell & Gash (2007)

Wider Theoretical Considerations

Relating to Intermediate outcomes & actual outcomes

Design, decision-making and implementation of the different measures. There are no true or false solutions for wicked problems, only better or worse, based on interests and values. Learning from each other’s perspectives, creating innovative solutions, enhance Trustworthiness. Face-to-face collaborative settings helping to achieve more effective, equitable and sustainable outcomes in multiple levels.

Sources: IRGC (2008), Rittel and Weber (1973), Ostrom (2010), Dannevig et al. (2013)

Relation to the case study evidence

Drivers: Different planning instruments, i.e. maps and other visualization tools that are designed during the process. Potentially these can be seen as small-wins

Barriers: Lack of mandate to implement the maps. Lack of sufficient amount of small wins

Best practice example: As such the different maps are perfect example what the cross-sectoral group could potentially achieve together if just given more mandate and resources to implement the decisions.

Example outside the working group: Installing the storm water management system to newly renovated public space was initiated by two hydrologist that have common interest and expertise. The installation can be seen as “small-win” that was originally initiated by two engaged municipal officials that work together in the same municipal unit.

Improvement potential: Setting more focus on common problem definition(s) that enables to have clear intermediate outcomes. Concrete problem statements that stem from the needs of different municipal units. Building Applications suggested of setting the focus to for example to mapping different guidelines and laws that would be beneficial for them (other than Planning and Building Act). Better focus on climate change adaptation plan that is clear and straightforward outcome. More mandate and follow-up to implement the “small wins”, e.g. planning instruments.