Collaboration avenues and structures within local climate adaptation governance - The case of local climate adaptation governance in Sweden

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Abstract
Climate change adaptation is essential to future-proof societies around the world. It is a cross-sectorial undertaking which requires collaboration, structure, long-term planning, and resources. Sweden has placed highly in international indices ranking climate work, yet scholars have recently argued that Sweden's approach to climate questions, especially adaptation, is fragmented. This thesis furthers those arguments by thoroughly analysing Sweden's internal collaboration avenues and structures. It brings forward which actors are key in Sweden's adaptation work, which actors that are the ones experienced as most important by local governments, and how the organizational structure of key actors may influence adaptation work. It also exemplifies challenges within adaptation collaboration by highlighting a somewhat forgotten actor within adaptation, the Transport Administration, which oversees key infrastructure that must be adapted for the future. Moreover, the research highlights one possible avenue for more holistic adaptation, Robust Decision-Making. This thesis finds that; adaptation is not suitably integrated into current institutionalized governance processes; Key actors, mainly SMHI, MSB, CABs, and municipalities, have different structures and approaches to the question of adaptation, potentially inhibiting collaboration; That holistic adaptation approaches are not well utilized by municipalities and seems to be a mainly academic product, thus far.

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Summary

The effects of climate change are becoming more and more visible for each passing year. The importance of mitigating further climate change cannot be overstated, yet it is not enough to simply mitigate. The global society has reached a point where adapting to the future climate is essential. Sweden ranks highly in several indices about climate work and is regarded as a leader in climate work globally. Recently, this picture of Sweden has been scrutinized by scholars who argues that Sweden's internal climate adaptation system does not deserve this praise. Sweden's internal adaptation structure have been argued to lack a holistic view of adaptation, have unclear division of responsibilities, and inefficient collaboration avenues. However, previous research has not sufficiently explained how these issues are connected to collaboration that takes place across administrative and geographical borders, which actors that are key in shaping the system, or highlighted the importance of organizational structure among climate adaptation actors. It is in this conjunction of unanswered questions that this thesis contributes to the field of climate adaptation scholarship.

By viewing climate adaptation through the lenses of problem framing, governmentalization, and transformative adaptation, this thesis conceptualizes climate adaptation as a governance process which is influenced by, and influences, other processes within local governance. Climate adaptation is thus shaped to fit into already institutionalized processes that do not necessarily reflect the entire scope of adaptation but is slimmed down to a few key points that are made manageable. In Sweden's case climate adaptation becomes a technical question of how to shape spatial planning, how to decrease the effects of natural hazards, and how to do this as locally as possible with little intervention from the national government.

This thesis has collected material from all of Sweden's 21 County Administrative Boards, as well as the 'best' climate adaptation municipality within each county. This material shows that the organizational structures in different municipalities and in different County Administrative Boards differs significantly. An aspect that influences which adaptation strategies that are deemed viable and desirable. This primary material was supplemented with a survey to the adaptation officer in each of the 21 municipalities and a content analysis of 21 different 'samrådsredogörelser' from the Transport Administration in each of the 21 municipalities, which highlights if adaptation has been an issue of discussion when building transport infrastructure. This process yielded results that shows a lack of focus on adaptation measures across geographical borders, that diverse actors are experienced as key collaboration

partners with the municipalities, and that the transport infrastructure seems to be adapted in silos.

In conclusion, three main points emerge from the results and discussion of this thesis. First, that organizational structures among adaptation actors differs, although adaptation is mainly a part of spatial planning, risk/preparedness, or on a strategic level being directed by the boards of municipalities or County Administrative Boards. Second, that two actors, the Swedish Meteorological and Hydrological Institute and the Swedish Swedish Civil Contingencies Agency, acts as gatekeepers to the adaptation field, and potentially forms climate adaptation as a question with an emphasis on technical capabilities. Lastly, that holistic adaptation is not widespread in Sweden, and that it seems thus far to be more of an academic product than something that has trickled out into climate adaptation work on a local level.

List of Abbreviations

County Administrative Board	CAB
Swedish Metrological and Hydrological Institute	SMHI
Civil contingency Agency	MSB
Intergovernmental Panel on Climate Change	IPCC
Research question	RQ
Göteborgsregionen	GR
Robust Decision-Making	RDM
Dynamic Adaptive Policy Pathways	DAPP
Collaborative Risk Informed Decision Analysis	CRIDA
Nature-based Solutions	NBS
Svergies Geologiska undersökning	SGU
Statens Geotekniska Institut	SGI

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1. Introduction

Adapting to the effects of climate change is one of the most important challenges that must be dealt with across the globe. Different countries and regions have different approaches to adapt society. Sweden, as an internationally recognized leader in the work with climate change (Burck et al., 2020; Wamsler and Brink, 2014), as well as having specifically articulated the ambition to be a frontrunner in climate questions (Government Proposition 2008/09; Government Proposition 2016/17), is believed to have an efficient mechanism for working with climate adaptation internally. Although, recent literature on the topic of Sweden's climate adaptation argues that there are several shortcomings (Olsson, 2018; Wamsler and Brink, 2014; Schultze et al., 2022), internal investigations have reached similar conclusions (Statens Offentliga Utredningar, 2017; Riksrevisionen, 2022). Sweden's internal mechanisms for climate adaptation lacks holistic governance, sufficient resources, and internal collaboration (Persson et al, 2021; Glaas, 2013; Storbjörk, 2007; Riksrevisionen, 2022).

Furthermore, one challenge that seems to thus far be largely ignored is that of internal cross-border climate adaptation, cross-border is here understood as adaptation measures, or the need thereof, between two or more municipalities or counties, not international borders. These geographical and administrative borders put up frames that do not necessarily reflect the 'best' way to cope with a certain risk that needs to be adapted to, but just fit that issue into the preexisting legal and institutional environment (Becker, 2021a). Despite both being recognized as a leader in climate questions, and having the ambition to be one, previous scholars have highlighted the fragmented governance of climate adaptation in Sweden (Olsson, 2018; Johansson and Mobjörk, 2009; Glaas, 2013). To investigate this puzzling relationship this paper will boil down the above-mentioned conundrum to three researchable questions: First, *how does Sweden govern local climate adaptation, and does the relevant actors collaborate in this field?* Second, *is climate adaptation governed in similar ways across Sweden, both geographically and administratively?* Third, *how could climate adaptation be governed more holistically in Sweden?*

The structure of this thesis is as follows. The *Contextual Background* section briefly explains how climate adaptation is generally governed in Sweden. The *Research design* and methodology chapter lays out in detail how the research has been conducted and justifies decisions about data gathering and interpretation. The *Theoretical framework* introduces the theoretical foundation of the thesis and explains concepts that are key for understanding the

discussion part later on. In *Results*, the findings from the analysis of primary material and the results of the expert survey are presented. The *Discussion* part relate the results to each other and ties back into the theories explained in the Theoretical framework, this presents a nuanced picture of how climate adaptation governance looks in Sweden. Lastly, the *Conclusion* summarizes the findings and briefly answers each of the Research Questions asked in the beginning.

2. Contextual background

Climate adaptation in Sweden is almost exclusively managed on a local level by municipal regulation and legislation (Statens Offentliga Utredningar, 2017), specifically by city planning officers (Olsson, 2018; Wamsler and Brink, 2014). Although there are several regional and national agencies that have been tasked with certain responsibilities in the ordinance about governmental agencies climate adaptation work (Climate ordinance, 2018), which by and large frames climate adaptation in Sweden since 2018 (Riksrevisionen, 2022). The agencies that have been tasked with specific responsibilities to further Sweden's climate adaptation agenda include the Swedish Metrological and Hydrological Institute (SMHI), the Housing authority (Boverket, 2021), all 21 County Administrative Boards (CABs), and not as pronounced yet has an important role, the Civil Contingency Agency (MSB). Beyond the more specific tasks that these agencies have been given, there are 29 other agencies that have a more overarching responsibility of including climate adaptation in their planning and activities (Climate ordinance, 2018). One of these 29 is 'Trafikverket', the Swedish Transport administration. Trafikverket is responsible for planning, maintaining, and developing the roads and railways owned by the state (Trafikverket, 2023).

The following is an example of internal criticism that exists within and between adaptation actors in Sweden which contributes to the picture of fragmentation in governance. Stately owned roads and railways make up the majority of major roads that goes between counties and municipalities, but also some of the more trafficked roads that goes into all cities (Trafikverket, n.d.). This means that Trafikverket are governing an aspect that is inherently cross-border, and something that is in need of adapting to the climate of the future (Statens Offentliga Utredningar, 2017, p.423). Trafikverket themselves further iterates the importance of planning long-term and to take a changing climate into consideration in their work (Liljegren, 2018). Moreover, the expert council on climate adaptation highlights that transport systems must be planned very long-term because of their long lifespan, which makes them more difficult to adjust and adapt afterwards (Schultze et al., 2022, p.339). Despite that Trafikverket seems to

be aware of their role in adapting society to a future climate, they have recently received strong criticism for their 12-year plan of how the transport infrastructure should develop (Regional Utveckling & Samverkan i Miljömålssystemet, 2021). The criticism is strongest from the CABs and highlights that Trafikverket neglects their role in societal planning, does not take biodiversity into consideration, and is inherently incremental in their plans with no thoughts as of how to create a society that is less dependent on cars to reduce the climate impact in line with governmental goals (ibid.). Some CABs goes as far as saying that Trafikverket goes against the directive given by the government as to how the transport infrastructure should develop (ibid.).

This internal criticism from one climate adaptation actor to other points to some fragmentation within this question. Yet, current discourse on climate adaptation in Sweden focuses on other important questions, mainly regarding responsibility and equality (Persson et al., 2021), financing adaptation measures (Glaas, 2013; Storbjörk, 2007), how 'much' adaptation is required (Kanyama, et al., 2019), and how to include nature-based solutions (NBS) (Wamsler et al, 2020). What is to a significantly lesser extent examined or analysed is how the internal collaboration within Sweden works, if it is a functioning model of working with climate adaptation, and if the processes that are central to climate adaptation are governed similarly across Sweden. These aspects are key to understand what makes for a holistic governance model of climate adaptation.

3. Research design and methodology

To answer the three RQs asked above this thesis employs a research design that consist of several different pathways. First, an analysis of 21 CABs and municipalities which are the key actors within climate adaptation (Olsson, 2018; Wamsler and Brink, 2014; Statens Offentliga Utredningar, 2017). Second, to gain insights into cross-sectorial collaboration and cross-border adaptation the Tranpsort administrations 'samrådsredogörelser' will be analysed. Third, focusing on how holistic adaptation could be integrated into the current system this thesis draws on previous works in combination with asking professionals in the field if this is done today.

The data that will be the foundation of this thesis' discussion and conclusion consists of targeted material concerning the above-mentioned pathways. This section will explain what data, why that specific data, how that data will be analysed, how that data was collected, and why this approach is the most appropriate to research the phenomenon of fragmented governance of climate adaptation in Sweden. Moreover, answering these questions will

contribute to understanding the Swedish climate adaptation systems challenges, and may also provide awareness about possible solutions to these, especially within the collaboration between different governance levels.

3.1 Previous methods and guiding research in the field

Analysing climate adaptation governance in certain national settings is not a new endeavour by any means, but the way this thesis is structured fills what seems to be a gap in current literature, the internal collaboration between different administrative and geographical systems, and differences in problem framing, in Sweden. Inspired by previous research in this area, especially by Olsson (2018), Wamsler and Brink (2014), Brink and Wamsler (2018), Glaas et al. (2022), Becker, (2021a; 2021b) and the view of adaptation presented by Eriksen et al. (2015), this thesis draws on those projects to shape the research.

Olsson's (2018) dissertation concerning how climate change adaptation as a problem in Sweden is conditioned on "…the current order of things" (Olsson, 2018, p.212), thereby reproduces the current paradigm of growth-oriented development, shows how limited municipalities can be in their efforts to adapt to climate change. Moreover, this dissertation focuses on how current socio-environmental conditions limits the possibility of more transformative climate adaptation. This is something that this thesis latches on to and reiterates in a 'new' setting in Sweden, that of the post-2018 significant climate-related legislation that has been implemented (Naturvårdsverket, n.d.c; Climate Ordinance, 2018). The method employed by Olsson (2018) is that of problem framing, connected to the WPR framework developed by Bacchi (2012). This thesis uses the same framework, albeit to look at a slightly different aspect, that of organizational structure of all CABs in Sweden, as well as 21 selected municipalities.

On a slightly different note, Wamsler and Brink (2014) evaluated how adaptation was worked on in different municipalities and the similarities and differences in approach. Moreover, Wamsler and Brink (ibid., pp.1378-1379) conclude that there is a significant lack of institutional support for adaptation planning on a municipal level. This approach, to focus on how municipalities work with adaptation planning as a way to evaluate how coherent it is in Sweden, is something that this thesis employs as well, although with more focus on organizational structure and collaboration.

More recently, Glaas et al. (2022) has conducted a significant deep dive into how a municipality in Sweden could enable a more transformative approach to adaptation through more meaningfully including citizens in the process. The conclusion from this study is highly

relevant for the third research question of this thesis, which investigates how the adaptation governance in Sweden could be more holistic.

The choice of theoretical framework for this thesis was made on the basis of the dissertation by Olsson (2018), and the excellent framing of adaptation made by Eriksen et al. (2015). Through Eriksen et al. (2015) the political dimension of the climate adaptation debate is included, and the notion of maladaptation is introduced.

Specifically for the third RQ of this thesis, an extensive literature search concerning holism, transformative adaptation, robust decision making, decision making in uncertain settings was conducted. This search narrowed down what material concerning a more holistic approach to adaptation to a question about robust decision-making (Wikman-Svahn, 2021).

3.2 Actor selection

This section will explain choices regarding which actors and what data is specifically chosen for this thesis. These choices are all made to make this thesis as comprehensive as possible when detailing the governance of climate adaptation on a local level, on a regional level, and the collaboration beyond administrative and geographical borders.

The key actors included are the municipalities, the CABs, and the Transport administration. To include municipalities in research regarding climate adaptation governance in Sweden is almost a must. Municipalities are the entity that carries out climate adaptation 'on the ground' and has in previous research and public reports been highlighted as the key actor in adaptation work (Olsson, 2018; Wamsler and Brink, 2014; Schultze et al., 2022; Statens Offentliga Utredningar, 2017). The specific municipalities included in this thesis have been chosen for several reasons.

First, since one aspect of this thesis concerns the possible geographical and administrative differences, municipalities from different parts of Sweden have been included. Secondly, to not haphazardly choose municipalities in different parts of Sweden, and to hopefully be able to show that the municipalities included actually do work with climate adaptation, which is not the case in all municipalities in Sweden, the 'best' climate adaptation municipality per county in Sweden has been included. There is one quite well-known ranking of climate adaptation work on a municipal level in Sweden, done by IVL environmental institute and Swedish insurance (Matschke Ekholm et al., 2021), from which this thesis included the highest-ranking municipality per county.

With the new climate adaptation legislation from 2018 (Climate ordinance, 2018) the CABs were tasked with following up on municipal climate adaptation work, coordinate and support adaptation work done by state agencies, improve documentation and knowledge, and

analyse regional and interregional effects of climate change (ibid.). Beyond these specific tasks, the CABs are responsible for overseeing and approving all planning (oversight plans and detailed plans), and all proposed constructions. The CABs are thereby controlling and 'pulling the strings' when it comes to current climate adaptation work, which almost exclusively focus on spatial planning (Olsson, 2018, pp.19-22; Statens Offentliga Utredningar, 2017).

The probably most controversial decision for actor selection in this thesis is that the Transport administration is included. The Transport administration does not have any specific responsibilities through the Climate ordinance (2018), they are but mentioned as one of the 29 agencies that has to include adaptation work in the planning and activities. Despite their seemingly large distance to the question of climate adaptation, they are one of the actors that deal with every municipality in Sweden, individually or in a more cross-border capacity, and work with spatial planning extensively. Moreover, the expert council has highlighted the importance of transport systems as a process that must be planned very long-term due to its lifespan and difficulty in adjusting and adapting at a later stage (Schultze et al., 2022, p.339). The longevity of the Transport administration's planning received harsh criticism from CABs across Sweden when they recently released their 12-year plan (Regional Utveckling & Samverkan i Miljömålssystemet, 2021). How the Transport administration works with climate adaptation as the link between municipalities can therefore reveal how collaboration between different governance levels manifests.

Furthermore, Trafikverket uses the Intergovernmental Panel on Climate Change, (IPCCs) RCP 4.5 scenario as the scenario from which they make their long-term decisions, except when it comes to sea-level rise, an area where they instead utilize RCP 8.5 (Liljegren, 2018). Which RCP scenario to use when planning is not regulated in Sweden but is left to each and every actor to decide (Naturvårdsverket, n.d.a). Although, Naturvårdsverket, the Swedish Environmental Protection Agency, points out that for planning of certain activities, such as building buildings, transport infrastructure, or water and sewage, which scenario is chosen to plan for is of great importance (ibid.). Especially important is to advance adaptation measures that are robust, fitting for a multitude of future scenarios, and adaptation that is flexible to deal with unexpected changes (Olsson, 2018, p. 91; Naturvårdsverket, n.d.b).

3.3 Data collection approaches

3.3.1 Expert survey

As this thesis aims to fill the gap in current literature of a detailed examination of local climate adaptation collaboration between different official actors, as well as highlighting

similarities and differences between different administrative and geographical systems in Sweden, the research has been designed with this in mind. The data collected for this thesis consists of three different strategies to collect relevant primary data.

First, answers by climate adaptation professionals to a survey that was sent out in early March to 21 different municipalities in Sweden. From the municipalities there is not one uniform way of conveying how they work with climate adaptation. Information pertaining to adaptation work could be included in an oversight plan, a climate adaptation plan, preparedness plans, environmental strategy documents, or just be non-existent. Looking through and analysing all the different plans and strategies was thus too big a task for this thesis. Therefore, a survey was sent out to the person responsible for climate adaptation in the 21 municipalities chosen with a set of questions centred around collaboration aspects of climate adaptation work, and with some questions about organizational structure and robust decision making (see appendix A). The logic behind sending out a survey to the person responsible for climate adaptation is that those results are easier to compare and contrast, they reveal information that this thesis deems the most important and is less time consuming than analysing a few thousand pages. This aspect is meant to yield information that helps this thesis answer all three research questions (RQs).

3.3.2 Organizational structure analysis

Second, the organizational charts for each of the 21 CABs in Sweden was included (See Appendix B). This was collected through emailing every CAB and asking for the organizational chart. From the CAB the most important aspect for this thesis is their organizational structure, since this can reveal how climate adaptation is framed utilizing the problem framing framework by Bacchi (2012). This in turn matters for what each CAB is emphasizing in their work with climate adaptation, which all stems from the same climate ordinance (2018). This is targeted at the second RQ about similarities within the governance across different geographical and administrative boundaries.

3.3.3 Content analysis

Third, 21 different 'samrådsredogörelser'[1] that were conducted by the Transport administration in each of the 21 municipalities that the survey was sent out to, this information is publicly available and was collected on the Transport administration's website (Trafikverket, n.d.). Such a document contains information pertaining to what actors, that are affected by a plan to build something, have said about the plan, and this must be published according to Swedish law (Boverket, 2022b). These documents often contain comments from municipalities, regions, CABs, other governmental agencies and can contain information from organizations, citizens, and private companies. Since Trafikverket does work all over Sweden, their 'samrådsredogörelser' was cross-referenced with the municipalities that are already included in this thesis, and the newest one connected to each municipality, since climate adaptation was first meaningfully legislated in 2018 (Climate ordinance, 2018), was included in the analysis. These documents were targeted to contribute to the answer of RQ one specifically, and somewhat RQ two.

3.4 Secondary material

Beyond these three primary sources, secondary material in the form of the most recent ranking of municipalities when it comes to climate adaptation (IVL, 2021), the two most recent and significant investigations into climate adaptation issued by the government (Riksrevisionen, 2022; Statens Offentliga Utredningar, 2017), the recent 800-page report by the expert council on climate adaptation in Sweden (Schultze et al., 2022), and a multitude of previous scientific articles on the topic is used to rationalize choices of material, and emphasize key aspects of climate adaptation in Sweden. Moreover, a literature search for transformative and holistic climate adaptation work in Sweden was done, this laid the groundwork for the third RQ and the resulting category was brought into the survey sent to the municipalities.

3.5 Data analysis

This thesis has been shaped with a theoretical background that is anchored in governmentality. Utilizing governmentality as the base means that certain types of data is more relevant to critically examine. Governmentality is especially adept at examining the "…connection and problematization of political rationalities, systems of knowledge and micro-

[1] A document containing information of how an entity that is planning to build something has heard and taken into consideration viewpoints from all actors that may be affected by the upcoming structure (Boverket, 2022)

practices…" (De Roeck, 2019: 162). The method has therefore been shaped to focus on written primary material and organizational structure, as well as a survey to find answers to relevant questions on a local level. This approach allows this thesis to contrast and compare similarities and differences between different governance systems in the Swedish context.

Qualitative content analysis is exemplary to use when examining a vast amount of data but not particularly interested in the number of times a certain word is mentioned, but more in what context it is mentioned. Content analysis as a strategy is the exercise of discerning what a certain word means in a certain setting, it is about how the words utilized in specific texts shape the world around us (Lamont, 2015; Halperin and Heath, 2017).

3.6 Operationalizing the data

This thesis utilizes an inductive approach to categorize the data. The organizational charts from the CABs, the survey to the municipalities, and which organisations that will be more highlighted than others because they are key collaborators to municipalities, are the foundation for the categories of how climate adaptation is framed. These categories have been derived from the data and then developed into different framings of climate adaptation with the aid of the WPR framework in the discussion (Bacchi, 2012).

In the documents from Trafikverket the words adaptation, or variations of that word, (in Swedish Anpassa, anpassning, anpass), as well as the word climate, (in Swedish klimat), have been searched for to analyse the paragraph and subchapter where the word is written, and if it is a comment in the 'samrådsredogörelse' it is noted who made that comment. This approach allows for more material to be included in this thesis without having to read several thousand pages of material that is not relevant to this thesis. The word environment (in Swedish miljö) is actively not included because it is often mentioned as part of something called environmental consequence description (miljökonsekvensbeskrivning) which only focus on how the building of the project affects the environment, not how the project ought to be adapted to the environment of the future (Naturvårdsverket, n.d.b).

The survey from the municipalities is used to contrast the findings of the content analysis, as well as to point to more direct similarities and differences. This combination of approaches to achieve triangulation is meant to contribute to a more robust data set and adds further depth to the results and discussion below.

4. Theoretical framework

This thesis has thus far explained the methodological approach that will guide how the research in this thesis will be conducted. It has also highlighted something lacking in the current literature on the subject, a deep examination of internal structural differences and their impact, as well as collaboration between different actors and levels. With this clarified it is now time to turn to how this approach ties into the theories and concepts that has previously been utilized in the field and that best explain climate adaptation structures, all of this helps the thesis obtain its goal of answering the three research questions. First, *how does Sweden govern local climate adaptation, and how, if at all, does the relevant actors collaborate in this field?* Second, *is climate adaptation governed in similar ways across Sweden, both geographically and administratively?* Third, *how could climate adaptation be governed more holistically in Sweden?*

The theoretical and analytical framework that is the foundation of this thesis is primarily based on governmentality (Stripple and Bulkeley, 2011; Methmann and Oels, 2015; Oels, 2011). Governmentality provides an excellent starting point for shaping an understanding of how climate adaptation is governed within a certain setting (Lövbrand and Stripple, 2011: 28-30). In this thesis, the governmentality – climate adaptation nexus will be specifically in focus. Moreover, due to the flexibility of governmentality, three more notions/concepts will be the basis for this thesis, cross-border adaptation, problem representation, and fragmentation/holism from complexity theory. The combination of these different notions and concepts forms the framework of how this thesis understands climate adaptation, specifically in the Swedish context.

This part will introduce and partly discuss four key aspects of this thesis founding blocks. First, governmentality which is the broader understanding of how climate adaptation is governed as an issue, not only in Sweden, but generally in advanced liberal economies (Oels, 2005). Second, problem representation in combination with governmentality, that further shows how climate adaptation is governed, especially how it is made to fit current legislation and institutional practices (Corry, 2012; Blok, 2011; Bacchi, 2012). Third, fragmentation and holism as two opposites that can be used to characterize current climate adaptation governance, and possibly suggest a 'better' climate adaptation governance (Biermann et al., 2009; (Heylighen et al., 2011). Fourth and finally, cross-border adaptation which will allow this thesis

to draw conclusions from much of the primary material gathered concerning collaboration aspects across geographical and administrative borders (Benzie, et al., 2016; Carter et al., 2021)

4.1 Governmentality

Governmentality is a critical approach to the study of governance, which involves examining how issues are made manageable and how actors are governing in specific fields. This perspective allows for a critical, historicized examination of the governing process, rather than taking the mode of government for granted (Lövbrand and Stripple, 2011: 28-30). Michael Foucault first introduced the concept of governmentality through a series of lectures in the late 1970s. Since then, it has been developed by scholars, such as De Roeck (2019), Dillon (2007), Methmann (2010), Methmann and Oels (2015), Methmann and Rothe (2012), Oels (2011), Oels (2013), Stripple and Bulkeley (2011), into the analytical tool it is today.

The use of governmentality as an analytical tool has increased in popularity, particularly within the study of security or risk issues, notably within the power-knowledge nexus (De Roeck, 2019; Joseph, 2013; Oels, 2013). Governmentality can be used as a perspective to problematize, historicize, and criticize certain modalities of power, and also as an analytical tool to connect conceptualizations of power with governmentality regimes (Stripple and Bulkeley, 2011: pp.8-9). Additionally, governmentality can work in tandem with other perspectives to provide new insights into questions of rationality, power, and politics (ibid., p.9).

In this work, governmentality will be used in tandem with problem representation and cross-border governance to problematize and analyze climate adaptation governance in Sweden. This approach may help identify potential long-term maladaptive processes that can arise from current policies and practices and is a steppingstone to suggesting a more holistic approach. A maladaptive process can be defined as “adaptation that, in one way or another, worsens existing and/ or future conditions for individuals/ civil society/ corporations/ governments and/ or environmental values” (Glover and Granberg, 2021, p.1)

4.1.1 Power – knowledge nexus

Foucault's work draws attention to the fact that knowledge is not just a neutral or objective representation of the world, but rather is produced through complex processes that involve power, authority, and social relations. According to Foucault, knowledge is not something that exists in a vacuum, but rather is shaped by historical, social, and political forces that influence how it is produced, disseminated, and validated (De Roeck, 2019, p.161; Oels, 2013, pp.200-201; Oels, 2011, pp. 18-19).

One of the key implications of Foucault's analysis is that the production of knowledge is intimately linked to the exercise of power. Those who have the ability to produce and disseminate knowledge are able to shape not only what counts as "true" knowledge, but also what is considered "normal" or "deviant" behaviour, and what is deemed worthy of study and investigation (Oels, 2013, pp.200-201; Oels, 2011, pp. 18-19). The control and distribution of knowledge is often closely tied to systems of governance and social control. In many cases, knowledge is used to legitimize and reinforce existing power structures, while simultaneously marginalizing or excluding alternative perspectives and forms of knowledge (De Roeck, 2019, p.161).

Given these insights, it is crucial to critically examine the ways in which knowledge is produced and deployed in various contexts, and to question the assumptions and power dynamics that underlie these processes. By doing so, we can better understand the complex relationships between knowledge, power, and social change.

4.1.2 Governmentality in climate adaptation

Understanding these core aspects of governmentality is key when applying this thinking onto climate adaptation issues. Since climate adaptation is very context-specific (Owen, 2020, p.2), it is essential to be clear in what context one examines climate adaptation governance. Although, there are some more general challenges and practices when it comes to ‘developed’ economies (Sarkodie, et al., 2019). The focus of this thesis is on the Swedish context and will therefore in this section frame the governmentality regime that is shaping adaptation within Sweden.

Climate adaptation governance in Sweden is characterized by a decentralized structure where most of the power in acting on adaptation lies with the 290 municipalities. The power to decide and act on adaptation is confined within certain international, national, and regional frames though. Moreover, the capacity to act on adaptation relies on resources, where the disparity between different municipalities is immense (Statens Offentliga Utredningar, 2020). Most of these municipalities have limited resources for implementing adaptation measures themselves and do therefore rely to a large extent on external funding. Funding may come from CABs, governmental agencies, EU projects, or other similar actors. Although, the most important source of funding is a fund for the prevention of natural hazards that is controlled by the Civil Contingency Agency (MSB) (Riksrevisionen, 2022). This reliance on external actors for funding and frameworks secedes a large portion of the power that municipalities have

themselves. This is especially true when it comes to what type of adaptation is seen as appropriate to implement.

Municipalities are themselves free to decide how and if they work actively with climate adaptation because of the lack of clear legislation in this area (Lundh et al., 2022, p.90), although there are certain regulations that frame some aspects that could be included in adaptation work. The Plan and building act (PBL) constitute that the municipality must analyse how the risk of flooding, erosion, and landslides can impact the built environment, how this may be exacerbated by climate change, and how to reduce these risks (ibid.; Boverket, 2022a). Moreover, the environmental charter (Miljöbalken) contains regulations that make it the municipalities responsibility to adapt environmentally hazardous activity to possible future climate scenarios (Naturvårdsverket, n.d.a). These two regulatory frameworks exemplify some of the boundaries within which municipalities work and limit their power to act within climate adaptation. The next part will dive deeper into how these governance aspects may create a fragmented way of dealing with climate adaptation.

4.2 Problem representation

This thesis draws inspiration from previous literature about the structure and organisation of Swedish climate adaptation, specifically when it comes to what climate adaptation is represented to be in Sweden (Olsson, 2018, pp. 48-51). Same as the theoretical framework that Olsson (2018) is relying on, WPR (Bacchi, 2012), this thesis will utilize, but in combination with governmentality (Stripple and Bulkeley, 2011) to argue for the importance and possible implications of organizational structure.

This section will briefly explain the key aspects of the WPR framework, the connection to governmentality, and how this all may influence climate adaptation in Sweden.

4.2.1 Problem representation

As noted above, what knowledge that is ‘appropriate’, what is ‘normal’, and what is ‘deviant’, are all forms of exercising power (Oels, 2013, pp.200-201; Oels, 2011, pp. 18-19). One way of shaping this is through problem representations. Problem representations are in its essence the production of meaning of a phenomenon (Olsson, 2018, p.38). Meaning that how a problem is represented is a sort of ‘truth’ that is generally accepted in a certain field, or within a certain group. The connections to the Foucauldian arguments about knowledge and power are quite strong, and Bacchi (2012) connects the two through her framework WPR that is a tool to analyse policies with a Foucauldian lens.

Furthermore, Bacchi (2012, pp. 4-5) shows how one can 'backtrack' policies to analyse how a certain actor is shaping the problem, which in turn says how this actor views the 'truth'. The actors most often suggesting policy proposals are different levels of government, different agencies, or different types of organizations that are proponents for policies. The 'truths' that are disseminated through problem representations are rarely questioned in their core (Olsson, 2018, pp. 39-40). The way a problem is represented then turns into a condition for dealing with that problem that masks the political dimension of a certain way of representing a problem (ibid.).

The political dimension of climate adaptation is vital to include in discussions of climate adaptation (Eriksen et al, 2015). Adapting to climate change can look vastly different for different groups of individuals, organizations, agencies, etc., especially what is deemed positive adaptation or maladaptation (ibid.). A lack of a uniform understanding of adaptation among individuals or organizations working towards a common goal under the same regulatory and institutional framework may at best severely inhibit the efficiency of those processes, and at worst worsen the situation all together. Moreover, adaptation is mainly thought of as a politic neutral, technocratic response to climate change, but recent literature has challenged this view (ibid.). More recent conceptualizations of adaptation clarify that

> "…too narrow a focus on policy-making and planning in response to climatic stressors runs the risk of characterizing adaptation decision- making processes as exclusively beneficial and primarily technical or managerial, bounded only by economic and technical capacities as well as scientific uncertainty" (Eriksen et al, 2015, p.524).

This may not only make adaptation efforts costly and inefficient but may also inhibit any potential of transformative adaptation (Eriksen et al, 2015, p.523).

4.2.2 Problem representation and organizational structure of climate adaptation in Sweden

Furthering this argumentation about problem representation with an example from Sweden. If a municipality wants to implement climate adaptation measures anywhere in their municipality this must somehow be funded, currently there are no ways of directly funding such measures through any type of tax or fee (Andersson and Nilsson, 2021). Most municipalities, because of scarce resources, must therefore somehow secure external funding for such projects to afford them. There are several avenues to apply for funding, although most, if not all, put certain conditions on the funding. The one that is the most prevalent within Sweden is fund 2:2

from MSB (Riksrevisionen, 2022; Myndigheten för Samhällsskydd och Beredskap, 2023). This fund is however only paid out to quite large projects that rests on a risk analysis, cost-efficiency calculations, and that are aimed at reducing the impacts of natural hazards (Myndigheten för Samhällsskydd och Beredskap, 2023). The adaptation measures that are available to the municipality if they apply for this type of funding are then reduced to certain technical measures that fulfil the criteria of preventing deaths from natural hazards. The way the problem of climate adaptation is represented in this case is as one of technical measures to save lives, which is inherently close to risk management. Even though climate adaptation includes aspects of risk management, more holistic adaptation is about transforming the entire society to cope with the climate of the future (Fedele et al., 2019; Glaas et al., 2021). This also exemplifies how an issue that has recently appeared on the agenda is morphed to fit into current institutions and legislation (Becker, 2021b; Blok, 2011). This may be one contributing aspect to an increase in fragmented adaptation efforts all over the world (Intergovernmental Panel for Climate Change, 2022, p.20)

4.3 Fragmentation, holism, and transformative adaptation

Fragmentation, as a concept, entails the division of something into constituent parts, presenting an antithesis to holism. However, there is a lack of consensus in the literature regarding how to frame fragmentation of governance in a specific area. This paper will adopt the framework proposed by Biermann et al. (2009) for understanding fragmentation within governance. Consequently, two crucial considerations arise. Firstly, it is essential to acknowledge the relativity of fragmentation, as all forms of governance entail some degree of fragmentation, and there is no 'true' holistic way of either governing or researching anything (ibid., p.18). Secondly, fragmentation can best be categorized as occurring within and between three dimensions: institutions, actor constellations, and norms (ibid., p.6). These two considerations will guide this research when discussing the Swedish adaptation organisation.

Holism as a theoretical foundation is found within systems theory and the idea of open systems, that a system (in this thesis that of climate adaptation in Sweden), interacts with other surrounding systems (Heylighen et al., 2011). For example, at a geographical scale the global, international, and regional systems that Sweden are a part of. At an issue-scale, legislative frameworks, national policies, local policies, etc. that climate adaptation interacts with. Each system is also 'imagined' as having a boundary, inputs, and outputs. The boundary is to identify a system, but it must be emphasized that the system operates beyond its own boundary through

input of information, matter, etc. from other systems, and that it influences beyond its own boundaries through outputs of information, matter, etc. (ibid.). This way of imagining the system of climate adaptation is useful when discussing transformative adaptation which is here defined as "…fundamental systems' changes that address root causes of vulnerability [that] may be needed" (Fedele et al., 2019, p.116). Transformative adaptation is thus a view of adapting society by changing entire systems, i.e. how we treat our land, what constitutes sustainable development, etc., which stands in contrast to current practices of incremental adaptation that focus on technical capacities, or that are reproducing vulnerabilities again and again (Intergovernmental Panel for Climate Change, 2022, p.20; Fedele et al., 2019, pp.116-

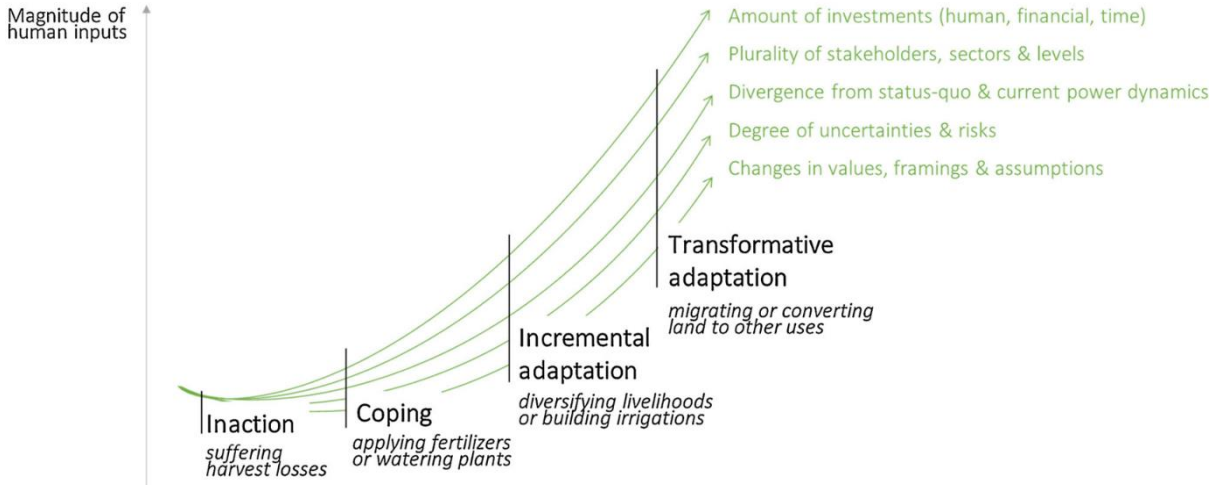


Figure 1. Types of strategies for reducing the impact of climate change on social-ecological systems, with examples from agriculture, along a gradient of increasing magnitude of responses (Fedele et al., 2019, p.117)

117). Figure 1 shows how the difference between transformative and incremental can be imagined.

4.3.1 Fragmentation and Holism in a Swedish context

Applying the arguments above to the Swedish context is not by any means a new undertaking. Previous scholars and reports have highlighted the issue of fragmentation in Swedish climate adaptation efforts in many different ways (see Wamsler and Brink 2014; Olsson, 2018; Schultze et al., 2022; Riksrevisionen, 2022).

On a concrete level this has for example been argued by municipalities that they are given different tasks by different governmental actors of what they need to do and the objectives from different agencies can be quite far apart from each other, or even directly contradictory (Olsson, 2018, pp.133-134). Moreover, municipalities argue that they need better data and help from expert agencies on everything connected to climate adaptation(ibid.), which could be anything from geological surveys to flood risk mapping to spatial planning legislation clarity. The

problem is then represented as a lack of knowledge, expertise, and often resources, and this is a type of fragmentation in the system itself.

The fragmentation can also be brought up to a higher level of abstraction. The municipalities attempt to figure out how to fit the problems associated with climate adaptation to their other objectives of growth, development, etc., thereby premising adaptation on the compatibility of current policies and objectives (Olsson, 2018, p.134). In many cases this can inhibit any type of transformative adaptation effort and does not contribute to a more democratic process of adaptation (Fedele, 2019; Glaas et al.,2022). Fragmentation is thereby prevalent on several planes in the Swedish context. A picture of climate adaptation as fragmented and incremental, with little effort to pursue more holistic or transformative adaptation emerges throughout this section, the details of how this materializes in a concrete setting will be brought forward in the discussion below.

4.4 Cross-border adaptation

One aspect of this thesis concerns how climate adaptation is dealt with across different geographical borders between municipalities, and the administrative borders between municipalities and other governmental actors that are in charge of some aspect of climate adaptation. Framing cross-border adaptation is a rather new undertaking from the scientific community (Harris, 2021; Carter et al., 2021; Moser and Hart, 2015). Yet the foundation of this thinking is inherently close to that of system thinking (Heylighen et al., 2011), especially within resilience (Bergström and Dekker, 2014). Moreover, cross-border adaptation thinking is not yet properly integrated into "…on-the-ground' adaptation planning" (Moser and Hart, 2015, p.13). This last aspect is something that this thesis dives deeper into in the Swedish context.

One problem with the cross-border frameworks that exists is that they almost exclusively deal with international borders between different states, and not 'internal' borders (Benzie et al., 2016; Carter et al., 2021). Despite the lack of 'internal cross-border' frameworks, the concept of cross-border adaptation has significant bearing on how the Swedish adaptation structure is set up. Framing adaptation beyond the narrow scope of one specific geographical area, or within the jurisdiction of one specific agency, organisation, or municipality can increase the understanding of the 'best' adaptation alternative (Carter et al., 2021). In combination with complexity theory, especially the concepts of holism and fragmentation (Glaas, 2021; Fedele, 2019; Heylighen et al., 2011), cross-border adaptation can be a useful tool to examine how adaptation is governed.

4.4.1 Cross-border adaptation in Sweden

There are no frameworks or established avenues through which cross-border adaptation is framed in Sweden (Schultze et al., 2022, p.11). What does exist is a few ad-hoc collaborative efforts between some CABs, governmental agencies, and municipalities that attempt a more holistic approach to adaptation (ibid., p.109). The CAB of Skåne, regarded as being in the forefront in matters concerning adaptation in Sweden, collaborates with SGI (Statens Geotekniska Institut), SGU (Svergies Geologiska undersökning), the CAB of Halland, and two coastal municipalities, to cope with the problems of a rising sea level and coastal erosion (SGU, 2023). This collaboration is quite unique and is one of only three that is highlighted by the expert council on adaptation's recent report about the state of climate adaptation in Sweden (Schultze et al., 2022, p.276).

These types of collaborative efforts are in this thesis understood as cross-border, since they are explicitly working with problems that cross both geographical and administrative borders. The cross-border concept will in this work be used to highlight that when several municipalities, or a municipality and a CAB or state agency are working together on a climate adaptation project they are managing a cross-border phenomenon, either crossing geographical or administrative boundaries. This is done to shed light on the shortcomings of coping with climate change in small incremental instances everywhere, some which may undermine or worsen others (Glover and Granberg, 2021; Juhola et al., 2016).

5. Results

This chapter will present the results found in this research. It is centred around the three different key actors, municipalities, CABs, and the Transport administration, to show and explain the depths of the climate adaptation governance in Sweden.

First, the organizational structure of the CABs and the part of the municipal survey that is aimed at how the organization looks will be presented. The result of the organizational material is the basis for the categories developed throughout this thesis.

Second, the similarities and differences across the geographical and administrative borders will be shown. This is to visualize the vast differences across Sweden of how climate adaptation structures look like.

Third, collaboration aspects will be in focus. Different aspects of collaboration, focusing on collaboration partners, cross-border collaboration, and collaboration avenues are showcased.

Fourth, how a more holistic governing of climate adaptation could look, although this will mainly be dealt with in the discussion.

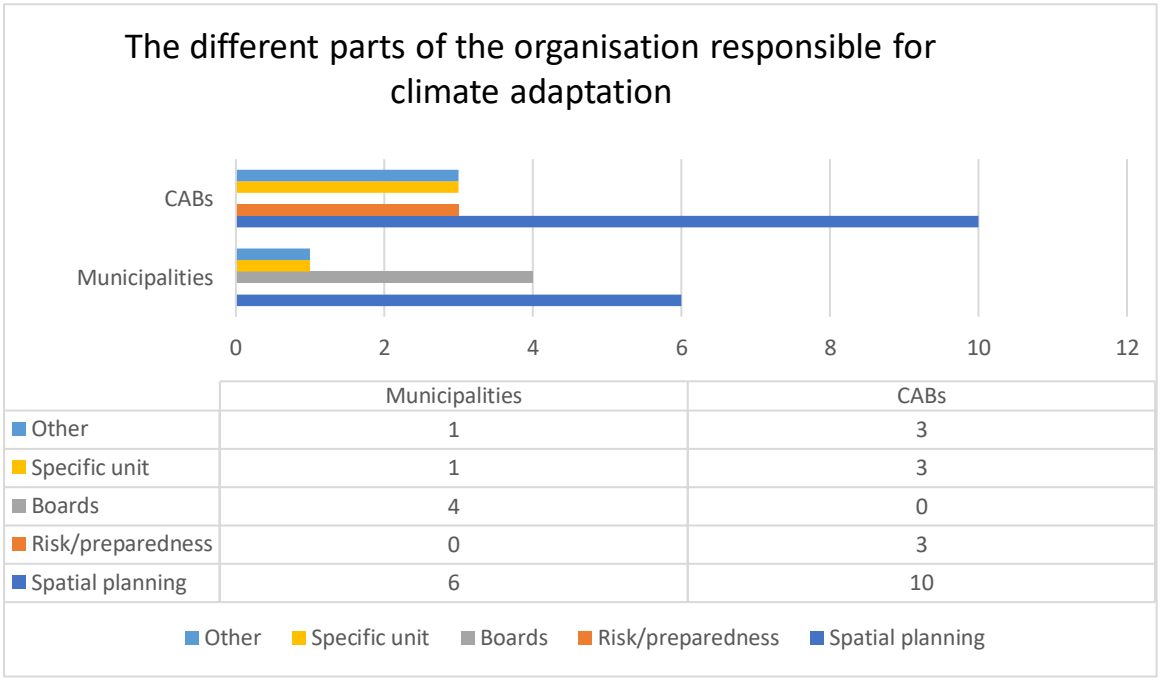
5.1 Organizational structure

Starting off with the organizational structures of both the CABs and the municipalities. The municipal survey was sent out to 21 municipalities, 12 of which answered the survey fully, and one which contacted the researcher for a further understanding of the questions.

The CABs organizational structure was gathered through emailing all 21 CABs in Sweden and asking them to send the organizational charts, and asking which department and unit that was responsible for climate adaptation questions. 18 CABs answered, and the three remaining organizational charts were found manually, two of which the department or unit responsible for climate adaptation is not entirely clear and will therefore read as unknown.

There is a slight difference between municipalities and CABs as to which departments and units are responsible for climate adaptation, but generally they are organized around spatial planning, the board of the respective entity, or risk/preparedness. Fig. 2 shows how the

categories are spread between the CABs and municipalities respectively.



	Municipalities	CABs
Other	1	3
Specific unit	1	3
Boards	4	0
Risk/preparedness	0	3
Spatial planning	6	10

Other Specific unit Boards Risk/preparedness Spatial planning

Figure 2 Overview of different organizational structures

5.1.1 Municipalities

The departments and units responsible for the question of climate adaptation in municipalities differ somewhat as can be seen in fig.2. There is a majority that has placed the question of climate adaptation under spatial planning or under the municipal board. From a reading of the surveys, those municipalities that have answered that the board oversees climate adaptation are referring to mainly strategic responsibility. Moreover, there is only one municipality that has a specific unit for climate adaptation questions.

There is not a single municipality that has the climate adaptation question under the department/unit of preparedness/risk. This is quite interesting since there is a multitude of CABs organized this way, more about that in the discussion.

Furthermore, there is two municipalities that are categorized as other, one of which answered that there is no one who specifically works with climate adaptation, but the units of strategic development and growth/spatial planning are working on projects related to climate adaptation. The other one answered that there is a working group around a climate adaptation plan, but beyond that there is no organized systemic adaptation work.

5.1.2 CABs

The CABs are more unison in their structures, but it is still only about half that have climate adaptation within the same department. There are more CABs than municipalities that

have specific climate adaptation departments/units, three in total. As noted above there are several CABs that work with climate adaptation together with preparedness/risk questions, which sounds logical but a point that will be further scrutinized in the discussion below.

There is only one CAB that stands out completely, that is Gävleborg, which works with climate adaptation under the guise of sustainable development.

5.2 Geographical differences

Above the different organizational structures that exist in the CABs and municipalities are presented, this section briefly goes into the geographical and administrative spread of the different structures.

In a geographical sense, there does not seem to be any relationship between the different structures of CABs and municipalities. The 12 CABs that deal with climate adaptation as a part of spatial planning span from Skåne to Gotland to Västernorrland. There are also municipalities in counties that have climate adaptation within spatial planning where the CAB does not have it (i.e Boden in Norrbotten, see Appendix A), or the opposite (i.e Karlstad in Värmland, see Appendix A).

Additionally, population size of municipalities and CABs could reveal that the bigger the population the bigger the organization of those large entities, and the larger the organisation the more specialized units. This does not seem to be the case when it comes to the CABs. In table 1 the population and structure of all municipalities and CABs are presented, which showcase the lack of correlation between size and structure.

Among the limited number of municipalities that are included in this thesis however, the biggest one that answered the survey is also the only one with a specific unit that deals with climate adaptation questions (Norrköping). This municipality is also the one that ranks the highest in IVLs ranking of municipalities out of all the respondents. This correlation may therefore not be that noteworthy.

Municipality	Unit/department responsible for climate adaptation	Population	Key collaboration partner(s)
Boden	Spatial planning	28,048	CAB

Gotland	No specific, only a climate adaptation plan	61,173	SMHI, energy and building companies on Gotland
Huddinge	Municipal board	114,504	CAB, MSB
Karlstad	Municipal board	96,466	CAB, SMHI, MSB, housing authority
Kungsbacka	Spatial planning	85,801	GR, RKS, CAB
Norrköping	Specific climate adaptation unit	145,120	Most frequent with SMHI, housing authority, and Linköping university
Skövde	Spatial planning	57,463	SMHI, CAB, Transport administration, research entities, municipal companies, property owners
Söderhamn	Municipal board	25,258	CAB, partners in EU project
Tierp	Municipal board	21,406	CAB, MSB, Naturvårdsverket, Upplandsstiftelsen
Umeå	Spatial planning	132,235	CAB, SMHI, Naturvårdsverket
Värnamo	Spatial planning	34,692	CAB
Västervik	Spatial planning	36,650	CAB, consultant, property owners, the Region
CABs	-	-	-
Dalarna	Risk/preparedness	288 310	

Gotland	Spatial planning	61 173	
Gävleborg	Other	287 334	
Halland	Spatial planning	342 805	
Jönköping	Other	369 113	
Kalmar	Spatial planning	247 711	
Kronoberg	Other	204 335	
Norrbotten	Risk/preparedness	249 177	
Skåne	Spatial planning	1 414 324	
Stockholm	Specific climate adaptation unit	2 440 027	
Södermanland	Specific climate adaptation unit	302 566	
Uppsala	Spatial planning	400 682	
Värmland	Spatial planning	283 976	
Västerbotten	Spatial planning	276 295	
Västernorrland	Spatial planning	243 265	
Västmanland	Specific climate adaptation unit	280 713	
Västra götaland	Risk/preparedness	1 758 656	
Örebro	Spatial planning	307 772	
Östergötland	Spatial planning	471 912	

Table 1. Municipalities and CABs structure and population. Population numbers retrieved from: SCB befolkningsstatistik 2023

5.3 Collaboration

On a note of collaboration there are a few different points of data within the material gathered.

Firstly, which other actors are seen as key by municipalities from the survey, but also which actors that highlights adaptation to the Transport administration in the 'samrådsredogörelse'.

Secondly, the extent of cross-border collaboration, which is one part of the survey, and can be deciphered from the 'samrådsredogörelse' by highlighting if a municipality or CAB that is not the one in which the building project takes place has commented on anything related to climate adaptation.

Thirdly, around what type of measure the collaboration takes place, can both be read from the surveys as well as the 'samrådsredogörelse'. For example, raising a bridge between different municipalities, flood mitigation measures upstream to reduce floods downstream, being part of any collaboration network such as Regional Coast Collaboration (RKS, n.d.), etc.

5.3.1 Collaboration partners

Key partners to the municipality, which is the actor most relied on within climate adaptation, are not very widespread. Generally, the municipalities that answered the survey listed the CAB, municipal organizations and companies, SMHI, and MSB. Analysing the 'samrådsredogörelse' further shows that SMHI and the CAB are key actors within the collaboration aspect. Naturvårdsverket, a state agency focusing on environmental questions, deserves an honourable mention as it was mentioned by municipalities, and had made comments in the Transport administration's 'samrådsredogörelse'. Important to note here is that municipalities could mention several key actors, and the analysis of the 'samrådsredogörelse' allowed for several actors to be included.

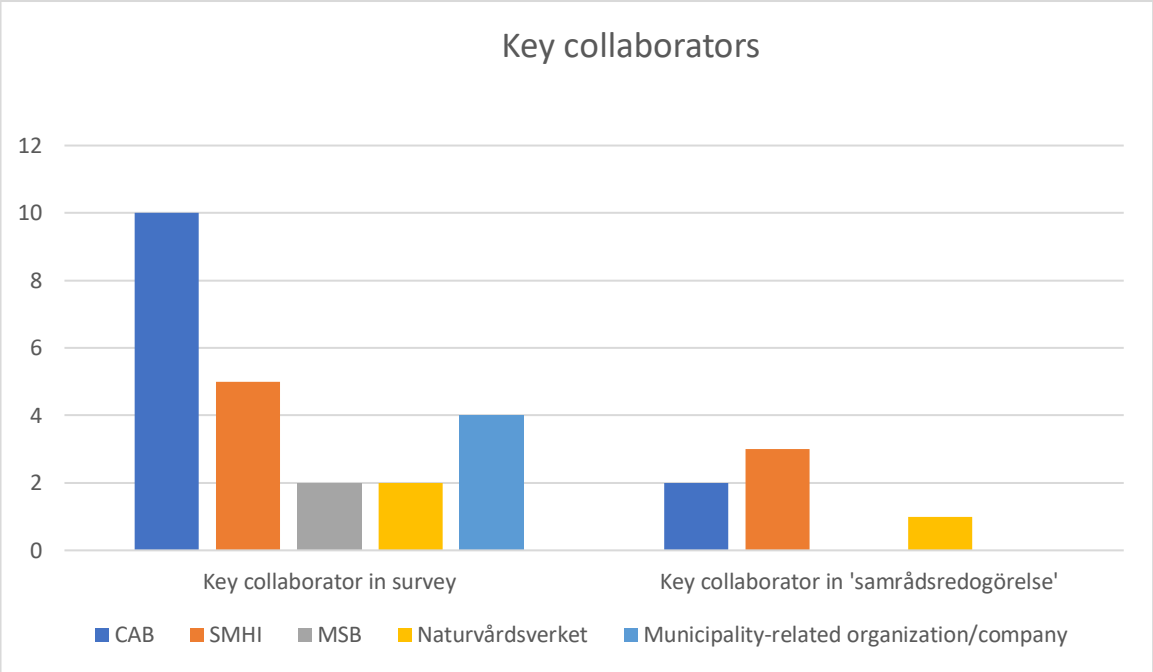


Figure 3. Key collaborators

Beyond the listed actors in fig 3, there were several both internal and external actors mentioned, such as the housing authority, EU-project partners, consultants, property owners, different types of networks such as RKS, Upplandsstiftelsen, and Göteborgsregionen.

Moreover, evident from fig 3 is that there were far less results from the 'samrådsredogörelse' than from the survey. This stems from the fact that the survey specifically asked a question about key collaborators, whereas the 'samrådsredogörelse' is public primary material that deals with comments about infrastructure projects by the Transport administration. The lack of focus on climate adaptation discussions in these documents is nonetheless quite interesting.

In table 1 above the structure of the municipality, their listed key collaboration partner, and the structure of the respective CAB that works in their region is cross-referenced. This could reveal insights into how important the organizational structure is to make collaboration easier and more efficient.

5.3.2 Cross-border collaboration and collaboration avenues

Moving on to the aspect of cross-border collaboration, reminding the reader that this thesis frames cross-border as between geographical borders within Sweden, i.e., between two or more municipalities, or administrative borders between the municipality and any other actor.

From the 'samrådsredogörelse' there is not a single instance where a neighboring municipality to the one where the project takes place that has commented on anything related to climate adaptation. The actors that have brought up anything climate-related are SMHI, the

CAB, the Transport administration themselves, the municipality where the project takes place, private citizen/citizen organization, and Naturskyddsföreningen. Noteworthy here is that only in four of the 21 ‘samrådsredogörelser’ climate adaptation is remotely discussed, two times more advanced with concrete geographical places and measures, and two times just mentioning that it should be taken into consideration. When it comes to mitigation or more general climate change consideration, it is dealt with in eleven of the 21 documents.

In the survey the municipalities answered, the main themes around cross-border collaboration are knowledge-sharing, collaboration with the CABs, collab with state agencies, or collaboration through networks such as RKS, GR, or with EU partners. Only two municipalities say that they do not have any cross-border collaboration.

Furthermore, the survey asks specifically about any collaboration with the Transport administration when it comes to climate adaptation, and there is not one single climate adaptation officer at the municipalities that has answered concretely that they are collaborating within this question. Two municipalities mention that they maybe, or indirectly are doing it, but not explicitly about climate adaptation (Norrköping, and Söderhamn, see Appendix A).

Diving deeper into collaboration, the survey specifically asked municipalities around what type of issues they were collaborating with across geographical borders. The categories that emergers from this data are quite narrow in its focus.

In fig. 4 we can see the response from the municipalities when asked about what type of

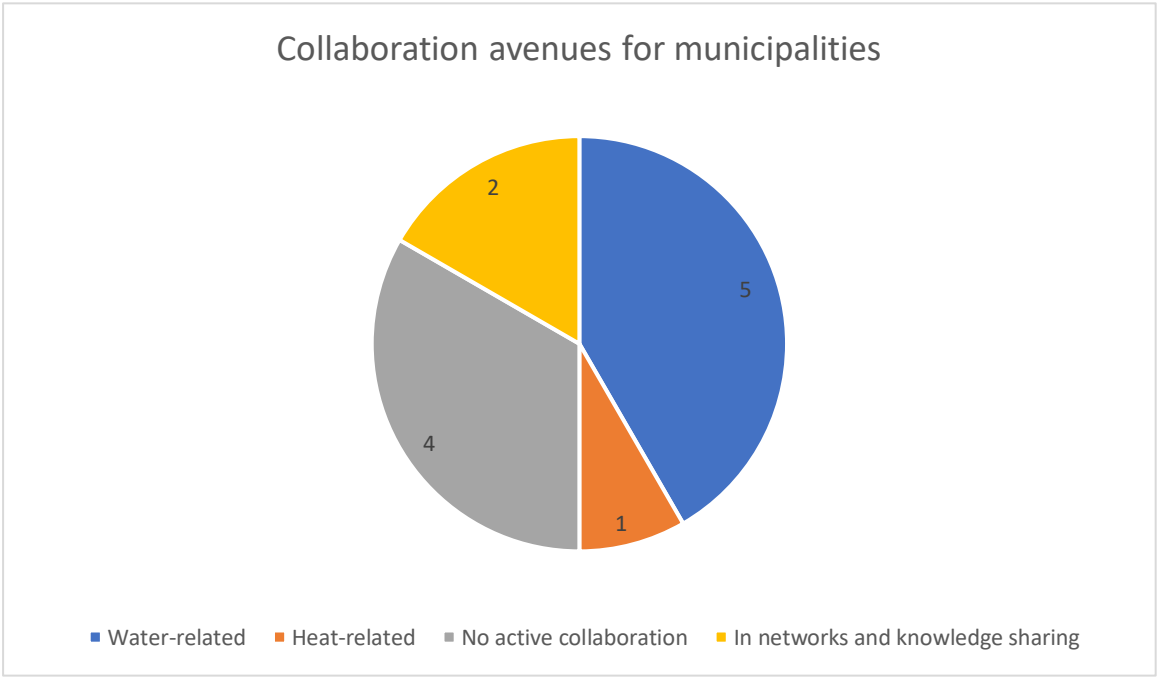


Figure 4. Collaboration avenues for municipalities

collaboration projects cross the municipal border.

The results from cross-border focus and from collaboration avenues have been written together because many respondents referred to earlier responses or gave a very similar response to the different questions for cooperation with actors outside the municipal organisation, and more specifically about climate adaptation measures that crosses the municipal border.

5.4 Holism through RDM

The third RQ of this thesis focuses on how to govern climate adaptation holistically. This question is by its nature quite abstract, and the results presented here do not paint the entire picture. Having said that, through an extensive literature search for holism, transformative, and robust climate adaptation planning in Sweden a picture emerged around the usage of the concepts of robust decision-making (RDM), Dynamic Adaptive Policy Pathways (DAPP), and Collaborative Risk Informed Decision Analysis (CRIDA) (Carstens et al., 2019). These concepts are utilized in a research project by KTH together with one CAB (Gävleborg) and three municipalities (Danderyd, Gävle, and Söderhamn), one of which is also part of this thesis (Söderhamn). This is the only project that includes municipalities and CABs with an aim at accomplishing more holistic climate adaptation found in the literature search.

From these findings one question was included in the survey, simply to ask the municipalities if they had worked with any of the concepts above when it comes to climate adaptation. This was not to categorically say that municipalities do or do not work holistically with climate adaptation, but as a probe to see how wide these concepts have spread since the start of the research project that brought them to light for some municipalities in 2015. Only one of the 12 respondents said that they worked or had worked with any of these concepts, which was Söderhamn. Västervik answered that they had not worked with it within the municipality but was part of a research project now where RDM was included.

6. Discussion

This discussion is structured around the three RQs asked in the beginning. First, *how does Sweden govern local climate adaptation, and does the relevant actors collaborate in this field?* Second, *is climate adaptation governed in similar ways across Sweden, both geographically and administratively?* Third, *how could climate adaptation be governed more holistically in Sweden?*

Answering these questions entails a combination of the theoretical framework and the results of this thesis. The discussion will thus bring to the forefront the interplay between the results presented above with the theoretical notions of governmentality, WPR, Cross-border adaptation, and holism, in the Swedish context.

6.1 Collaboration avenues in climate adaptation

The first RQ of this thesis concerns the governance and collaboration within climate adaptation in Sweden. The results above show that the CABs play a central role as a collaborating partner for the municipalities in Sweden, that collaboration seems to be centred around water issues, and that climate adaptation may not be a discussion often had as a collaboration point in transport infrastructure projects, despite the importance of their longevity (Schultze et al., 2022, p.339).

6.1.1 Collaboration partners and power

The key collaboration partners for the municipalities are the CABs according to the results above. This is not surprising at all and is in line with previous work in this field (Olsson, 2018, p.35; Wamsler and Brink, 2014). The CAB is responsible for coordinating and following up on municipal climate adaptation work in their region (Climate ordinance, 2018), and as will be discussed in 6.2 most municipalities in this thesis have organized the climate adaptation work together with spatial planning, an area where the CAB is even more involved in the municipalities work. Therefore, that the CAB is the key partner for most municipalities is quite expected.

What is more surprising however, is that not all municipalities listed their respective CAB as a collaboration partner because of all the administrative links between the two when it comes to climate adaptation. Cross-referencing the structure of the CABs and municipalities, including the listed key collaborators it shows that among the ten municipalities that included the CAB as one of their primary collaboration partners, six of them have organized climate adaptation within the same broader field as their respective CAB. These are also the only municipalities

that are working with climate adaptation within the same department as their CAB in this research. This aspect will be further discussed in 6.2.2.

Beyond the CABs there is an array of actors mentioned as collaboration partners, the 'top three' being SMHI, MSB, and internal organization and companies within each municipality. Moving past the internal organization in each municipality because they differ significantly depending on the context of the municipality, and are therefore difficult to discuss in any meaningful way. Both SMHI and MSB holds significant power within the climate adaptation arena in Sweden.

SMHI is the agency that has the most, and the clearest, responsibilities within the climate ordinance (2018). They are responsible for spreading knowledge, developing methods, counselling, and deciding how to follow up on and what should be reported to the government (ibid.). Through a governmentality lens, this means that SMHI is one of the, if not the, most powerful actor in Sweden when it comes to how climate adaptation is framed (Olsson, 2018, pp. 34-35). Beyond SMHIs responsibilities within climate adaptation, they are an expert agency within meteorology, hydrology, oceanography, and climatology (SMHI, n.d.). Their standing when it comes to providing accurate information about the climate and the weather is second to none (Kanyama et al., 2019).

Another aspect of SMHIs power of influence in climate adaptation is their task to follow up on government agencies, and municipalities, work with climate adaptation (Climate ordinance, 2018). They are currently doing so through their accounting tool 'KLIRA' (Sjöberg et al., 2018). In the survey to municipalities in this research one question was about if and how they follow up on their climate adaptation work, and there was only one of the twelve municipalities that mentioned that they are doing it through KLIRA. This points to a severe lack of information flow between municipalities, SMHI, and the government which then bases decisions on incomplete information. KLIRA is a yearly self-estimation survey sent out to the municipalities which is then summarized to a report by SMHI to present the results (ibid.). Although, the latest available report about the municipalities is from 2019, whereas a new report is released every year about the climate adaptation work of the governmental agencies (SMHI, N.Db). There is no available information as to why this is the case.

MSB on the other hand does not have that much to do with climate adaptation on paper, especially not since few municipalities seem to be organized so that climate adaptation and risk/preparedness work are under the same roof, the area where MSB is most well-known. Despite that, MSB controls the largest funding mechanism for climate adaptation in Sweden, the fund 2:2 from MSB (Riksrevisionen, 2022; Myndigheten för Samhällsskydd och Beredskap,

2023). MSB, together with SMHI and SGI are the entities that review applications for this fund and decide on their merits (Bahr and Ivarsson, 2020). All three of these institutions are quite technical and focus more on disaster reduction and prevention, than any type of long-term transformative type of climate adaptation. Moreover, this fund is only paid out to the prevention of 'sudden-impact' disasters, not the 'creeping crisis' of climate change (Jakobsson, 2021, p.131). This gives MSB significant power over in what direction municipalities must shape their climate adaptation efforts in order to receive external funding.

6.1.2 Cross-border adaptation and water issues

When it comes to the cross-border dimension of this thesis, the results show that the avenues through which municipalities are mainly cooperating are within water issues (Figure 4). There is likely a manifold explanation for the focus on water issues. Partly the intense focus on sea level rise and precipitation in the Swedish climate debate (Schultze et al., 2022, pp.42-43). As a country quite far in the north, heatwaves and urban heat islands, are relatively new to the discussion compared with sea level rise and pluvial and fluvial flooding. Additionally, several municipalities highlighted that they are having discussions on the access to drinking water that they share with other municipalities, and lakes that cross municipal borders.

This then suggests that municipalities collaborate more often when they share something physical with another municipality, although none of the municipalities mentioned any type of collaboration along roads, bridges, railways, or any type of infrastructure that runs between municipalities. Since the Transport administration is responsible for that type of infrastructure (Trafikverket, n.d) one would assume that it is through them that the climate adaptation aspect is included. Although, as highlighted above through their 'samrådsredogörelse', the document that likely would contain traces of collaboration between municipalities within transport infrastructure, there is not a single instance where a neighbouring municipality have commented on anything related to climate adaptation (see 5.3.2). There is also not a single municipality that highlighted any collaboration projects with the Transport administration when it comes to climate adaptation.

Even though water issues certainly are among the most important from a Swedish perspective, the lack of answers concerning spatial planning and infrastructure is quite odd. Since most of the CABs and most of the municipalities seems to think that climate adaptation is a question dealt with under the guise of spatial planning (Figure 2), one would think that this has transferred into a collaboration avenue between municipalities as well. The results do unfortunately not allow for any elaboration on what type of networks for knowledge sharing that the municipalities participate in, something that an interview approach might have. Despite

the lack of sufficient depth in the survey, the data is quite clear on one point. When it comes to cross-border transport infrastructure the municipalities do not take climate adaptation into account, this may be because they see it as the Transport administration's responsibility. Even so, a disconnect can arise if the Transport administration does not sufficiently take into consideration the climate adaptation plans, or other plans and objectives of the municipality, this can cause adaptation efforts that negatively affect each other, or be contradictory to other tasks given. As highlighted by Olsson (2018)

"[T]oday, many municipalities receive a long list of supporting documentation from the County Administrative Boards that concerns, for example, protected areas of different types, different national interests, shore protection, flood mapping, noise areas, and more. Not uncommonly, these different aspects can be contradictory and result in conflicting objectives" (Olsson, 2018, pp.134-135).

6.1.3 Transport administration

The Transport administration is one of the key actors included in this thesis, but their relevance when it comes to climate adaptation seems to be highlighted mainly from an academic standpoint (Schultze et al., 2022, p.339). The results above are telling a tale of climate adaptation in Sweden where the Transport administration is practically non-existent, and that transport infrastructure and climate adaptation are not discussed together (Table 1; Figure 3; Figure 4).

The Transport administration themselves have a climate adaptation plan which was established right after they were included as an agency that must include climate adaptation in their work in the Climate ordinance (2018). This adaptation plan states, among other things, that

"[t]he climate adaptation work is complex because the work must be coordinated with several external actors, such as municipalities, county administrations and other authorities. It takes time to build up skills and contact networks". (Liljegren, 2018, p.5, my translation)

It is moreover articulated that

"the issue of climate adaptation must form a natural part of the daily work of most employees at the Swedish Transport administration. This applies to both long-term and short-term issues in planning, maintenance, investment[,] and traffic management." (Liljegren, 2018, p.5, my translation)

These writings clearly place the ‘samrådsredogörelse’ within the scope of documents that ought to include climate adaptation, something that was not taken for granted in the early process of writing this thesis.

In the 21 ‘samrådsredogörelser’ analysed in this thesis only four contained any type of adaptation language, whereas there is climate change related language in eleven of them. There is significantly more said about mitigation, in one ‘samrådsredogörelse’ there is even an entire chapter about mitigation (Karlshamn, see Annex B), than there is consideration taken to adaptation. The climate adaptation that is dealt with in the ‘samrådsredogörelser’ is two of the four times more distinct and refers to something concrete. Once it is stated that the road will be adapted to the climate of the future, without any further clarifications (Strömsund samrådsredogörelse, see Annex B). The other time adaptation is brought up as a discussion around drinking water close to Tierp where it is stated that it is safe from the effects of climate change. Beyond those two specific instances, adaptation is mentioned in passing as something that will be taken into consideration by the Transport administration two times.

The severe lack of focus on climate adaptation in these documents is somewhat worrying for the future of the transport infrastructure across Sweden. Even the IPCC scenarios (Data Distribution Centre, 2019) from which municipalities and the Transport administration are planning long-term differentiates, which makes cooperation even more difficult, especially since they both must adhere to the ‘caution principle’ in such planning (Naturvårdsverket, n.d.b).

“[T]he contemporary planning paradigm remains linear and largely informed by experiential input. Basing contemporary adaptation strategies on such planning approaches downplays the path dependency of sociotechnical development and is liable to create lock-in points that limit future adaptation options and may push society into developmental dead ends.” (Payo et al., 2016, p.3)

The municipalities themselves are responsible for most roads within the municipality, but when it is a major road that crosses into another municipality the responsibility lies on the Transport administration. Yet, the effect of adaptation efforts on such roads will affect the surrounding areas significantly, and if the people working with transport infrastructure on a daily basis do think about the effect of adaptation efforts beyond the project within which the effort is aimed, the result is at best inefficient, and at worst maladaptive.

6.2 Structure and its relevance

The second RQ focus on the similarities and differences between the governance of climate adaptation in Sweden. The results points in all directions, basically that there is no coherency between what qualifications you need to work with climate adaptation questions in different parts of Sweden. The one most common way of framing it though is as a resource connected to spatial planning.

6.2.1 Spatial planning and problem framing

As Sweden grants municipalities the sovereign right to adopt land use plans (Planning and Building Act (2010), municipalities are the key actor in spatial planning. The entity closest to their power within spatial planning is the respective CAB of that municipality which is responsible for overseeing their land use plans, and either accepts or repeals detailed and oversight plans made by the municipality (Boverket, 2017). As per the results above (Figure 2), adaptation is most commonly framed as an aspect of spatial planning. This is concurrent with previous research and official reports on the subject (Statens Offentliga Utredningar, 2017; Olsson, 2018; Wamsler and Brink, 2014).

For the field of climate adaptation, and in line with WPR thinking (Bacchi, 2012), this means that climate adaptation in Sweden is mainly thought of as a problem that can be built away. While spatial planning of course is critical for long-term climate adaptation, especially city planning that creates zones where it is unwise to erect buildings due to future climate change impacts (Jönsson, 2023), it is still following the pattern of incremental adaptation that even IPCC has said is not enough (Intergovernmental Panel for Climate Change 2022, p.20). With too much of a focus on spatial planning in climate adaptation and the belief that sea walls or flood-proof buildings are enough, the more transformative aspect of adaptation that many believe are needed to properly cope with climate change risks being overlooked.

Beyond the possible risk of missing the long-term, holistic aspects of climate adaptation, that spatial planning and adaptation are so closely interlinked have further implications in the Swedish system. As seen above, two of the key collaborators to the municipalities are SMHI and MSB, neither of which has anything to do with spatial planning, yet ‘controls’ key aspects of the adaptation scene. Financing from MSB as the single largest fund that pays out money to municipalities who wish to undertake project to reduce the risk of a certain natural hazard (Myndigheten för Samhällsskydd och Beredskap, 2023). SMHI, which are in charge of spreading knowledge, following up on, and developing methodology for adaptation. On the other side of this coin is the housing authority (Boverket in Swedish), which regulates and spreads knowledge concerning spatial planning, but is a quite small player in adaptation circles.

The solutions to climate change in terms of adaptation can manifest completely different from an organisation which works with climate models, to one which works with risk prevention and preparedness, to one which works with planning regulations (Bacchi, 2012).

Moreover, not all municipalities, which are the actors doing the 'on-the-ground' work in adaptation, are structured the same way, which may further complicate cooperation, especially in the adaptation of cross-border related issues.

6.2.2 Geographical differences

Having highlighted how important the structure of the organisation is for how the problem, and thereby the solutions, are framed, that the differences geographically and administratively is as big as they are, is quite worrying for any hope/chance of a more transformative approach to adaptation in Sweden. Even though the most common way of structuring the adaptation work is within spatial planning, the differences that exist are spread across Sweden geographically (Table 1). There is some coherency found when looking at the structure of certain CABs and the municipality in that region which are working with adaptation under spatial planning. As previously mentioned, six of the municipalities that listed the CAB as one of the key collaborators, are structured the same way as their CAB when it comes to adaptation. Here is some correlation between the structure of the organization and the level of collaboration within adaptation.

Without any overarching structures of how climate adaptation ought to be governed on a local level in Sweden, actors govern the question differently everywhere (Glaas, 2013), but being organized the same way has some benefits when it comes to collaboration between different administrative borders. It can help with conceptual clarity of what adaptation is, since this is lacking from national government in Sweden (Olsson, 2018, p. 75; Glaas, 2013, p.66). It puts people that are working on an adaptation project in touch with people of similar knowledge when it comes to adaptation, thereby instituting a more efficient collaboration from the get-go since discussions about how adaptation should be framed are minimized. It reduces the power imbalances (Oels, 2013, pp.200-201) that a collaboration between someone as an 'expert' of adaptation and the other as a public servant of spatial planning, or preparedness, or even economy or industry, which likely has never been educated about adaptation.

6.3 Fragmented and holistic climate adaptation

The third RQ of this thesis focuses on if there are any pathways to achieve a more holistic climate adaptation field in Sweden. Initially, this builds on the assumption that adaptation today is quite fragmented, as understood by Biermann (2009) between actors, within norms, and

within institutions, an argument that can be found in this thesis, in previous academic work (Olsson, 2018; Wamsler and Brink, 2014), and even in official reports from Swedish official actors (Statens Offentliga Utredningar, 2017; Riksrevisionen, 2022). If the starting point is this picture of fragmentation of adaptation in Sweden, how can it become more holistic?

One aspect included in the survey of the municipalities was about whether they had worked with RDM, DAPP, or CRIDA, three kinds of uncertain decision-making conceptualizations. These specific types of holistic approaches to adaptation were chosen because of a literature search done to find any type of transformative or holistic adaptation research that had been done in Sweden, and these were the three holistic methods that was found to have linkage to Sweden in some way (Wikman-Svahn, 2021; Carstens et al., 2019).

There was one single municipality that had worked with any of these before, which was Söderhamn, because they were part of the MSB funded research about robust decision-making that ran between 2015-2021. That no other municipality had worked with any of these before is indicative of the low awareness about holistic approaches in general, and this specific research project especially. One reason for the low spread of these ideas may be that the project concluded that there are several barriers to these approaches in the Swedish system. How uncertainties about climate change are communicated, legislation around planning that does not allow flexibility in adaptation measures, organisations that often changes, most notably municipalities and CABs, cannot properly monitor flexible adaptation measures, and the attitudes and resources on a municipal level (Wikman-Svahn, 2021, p. 9).

6.3.1 Robust and uncertain decision-making

Three key aspects are important highlight that differentiates robust from traditional decision-making methods.

First, to embrace uncertainty. Today there is a tendency to always want better and more reliable results concerning everything, but that is not possible when discussing the climate of the future (Kanyama et al., 2018). To instead embrace uncertainty and acknowledge that there are no perfect solutions, and that scenario-based planning must be done on multiple scenarios, not only the one deemed most likely (Wikman-Svahn, 2021).

Second, to start with the ‘decision-situation’. This means that instead of trying to predict future climate-related hazards or adverse events and then attempt to backtrack that to see what must protect society against, starting with analysing what do we need to protect and then check for its vulnerabilities. It is about taking action through a method relying on what we know now instead of trying to predict what will happen in the future (ibid.).

Third and most applicable in Swedish adaptation, to find robust solutions. Robust solutions are solutions that are 'good enough' for any type of event, not perfect for a very specific event. Through either flexible or static solutions, flexible as in a sea wall that can be built higher in the future if needed, static as in that critical infrastructure is built on higher ground to safeguard for any type of sea level rise (ibid.).

The studies mentioned above focus on how to integrate uncertain decision-making systems into adaptation work in Sweden. The findings point to a system that has normalized a work method with adaptation that is built on, scaling down global climate models, integrating that into flooding models, and then using the results to plan for the future (Wikman-Svahn, 2021, pp. 6-7). Such a strategy does not embrace uncertainty, because it treats climate models as a 'sure thing' which it is not. It does not start with the decision-situation, because it tries to find out exactly what floods will occur and then base action on that information. It may utilize a robust solution, but those seem to be predominantly static, meaning that you add a few extra meters on the flooding levels 'just to be sure' (ibid.).

Such findings, of how adaptation is governed by municipalities, makes the findings in this thesis even more worrying. Considering the fact that most municipalities and CABs focus on spatial planning when discussing adaptation, that adaptation in that field is mainly governed and planned through imperfect models (because there are no perfect models), and quite rigid planning processes (Olsson, 2018; Kanyama et al., 2018), the fragmentation within adaptation in Sweden is not likely to cease.

6.3.2 Holistic adaptation in Sweden

What is needed to change the current adaptation paradigm is about moving towards more holistic adaptation, which means moving past the barriers explained above through implementing system-wide thinking, stop relying on imperfect predictions for the future, and working collectively towards a common goal (Kanyama et al., 2018; Olsson, 2018; Wikman-Svahn, 2021; Carstens et al., 2019).

The results above show that few municipalities work with any type of systemic holistic adaptation. There was but one municipality that was part of this thesis analysis that had worked with any of the concepts that are taken as indicators of holistic adaptation in this thesis. Implementing system-wide thinking is about transcending the arbitrary boundaries between municipalities and CABs that often hinder efficient collaboration in risk management or adaptation (Becker, 2021b). Possible barriers that have been identified in this thesis are; the difference in organizational structure which influence the problem framing; the restrictions of different funding mechanisms which shape the direction of adaptation work, and the lack of

concrete collaboration with actors that are dealing with areas that transcend the boundaries between municipalities and between CABs, especially focusing on the Transport administration. Although, that municipalities and CABs are structured differently when it comes to adaptation questions can either be read as a barrier towards collaboration, or as an indicator that adaptation is a transdisciplinary issue which requires different sets of competencies depending on where, geographically and/or administratively, the adaptation work takes place. If adaptation work 'needs' to be shaped differently depending on local contexts, the need for a clear goal of adaptation work is even more important. Adapting holistically to climate change is about ensuring that adaptation thinking and action is taken everywhere in society, on all levels in all sectors. In general, adaptation must become an aspect thought about as connected to every other question as well (Olsson, 2018, pp.219-220).

Embracing uncertainty is another step that would move the adaptation paradigm towards a more holistic nature (Olsson, 2018; Kanyama, et al., 2019). As shown with examples above, the difference in IPCC scenarios used in planning, as well as the overwhelming focus on technical solutions, may hinder efficient collaboration, and may lead to maladaptive solutions (Wamsler and Brink, 2014). With spatial planning being the most utilized field within which key actors work with adaptation, it is therein that embracing uncertainty and utilizing robust planning could enable and empower municipalities to act more easily. Since two of the most powerful actors in the field, SMHI and MSB, are working largely with technical solutions as the way to cope with climate change, the importance of acknowledging and working with uncertainty is overshadowed. Accepting the uncertain nature of climate change goes a long way in thinking about what can be done to become more resilient and robust (Olsson, 2018; Kanyama, et al., 2019).

The last point that would move the needle within holistic adaptation is for adaptation actors to know towards what they are working. Sweden does not have a clear adaptation agenda that municipalities and other key actors work towards. Sweden has a set of guidelines and laws that are somewhat incompatible (Lundh et al., 2022), funding schemes that are difficult to understand, and a division of responsibility that leads to f Regional Utveckling & Samverkan i Miljömålssystemet tration among actors within adaptation (Olsson, 2018, pp.194-202). Having a clear agenda could reduce the barriers of collaboration between different adaptation actors. Furthermore, it would contribute to an institutionalization of adaptation work (Olsson, 2018, pp.196), which is a process that may have started with the climate ordinance, but which still seems to lack sufficient clarity for adaptation to become more holistic. What would aid adaptation actors is clear guidance and a clear goal, as Flyvbjerg (2001, p.167). puts it "[…]

where we are, where we want to go, and what is desirable according to diverse sets of values and interests". If adaptation workers across Sweden knew the answers to these three questions, with whom to collaborate, what to prioritise the funding for, how to structure the adaptation work, would all be aspects that suddenly has an answer.

6.4 Method and limitations of this thesis

This thesis relied on several different methods to achieve the results presented above. One survey, the analysing of organizational charts, and a content analysis of primary material. This triangulation of methods is meant to improve the robustness of the thesis. Although, each of these methods has their own constraints, and the ambition to include 21 municipalities fully did not pan out since only 12 municipalities answered the survey.

The aim of the survey was to yield information about adaptation in the municipalities, but since it was answered by individuals in each municipality, the way in which they responded is likely influenced by how they perceive the municipality and their work, so their answers may not reflect the 'municipalities' views. Although, the question is if the municipalities' views even exist, and if they do, who can communicate them fully? The individuals that have answered the survey in this research are the people responsible for climate adaptation, it is therefore believed in this thesis that there is no better person to present the municipalities' views on adaptation.

The organizational charts are primary material and are therefore not 'tainted' by any individuals' subjective views, except those of the researcher. How the organization is influenced by its structure likely differs significantly between different organizations depending on individuals, power structures, and size of organisation. This means that something that this thesis has taken for granted, that difference of organizational structure is comparable may not yield perfect results. This is part of the reason why several methods were employed to gain more robust results.

Moreover, this thesis interprets that very few individuals at the municipalities said they knew about or work with robust or uncertain decision-making as that they do not work with this at all. This may not be the case, since one could employ the methods within these 'strategies' without actually being aware of the broader strategy itself. Although, this does then mean that if they utilize such methods it is not in any structured way with a long-term focus on it, since it would then be known to the individual responsible for adaptation.

The content analysis of the ‘samrådsredogörelse’ is likely the most analytically robust method employed in this thesis, but the choice of samrådsredogörelser specifically, as well as the interpretations of the results are highly subjective. Why the ‘samrådsredogörelse’ was selected has been argued for above, and its importance can be questioned, yet it presents a piece of material rarely analysed and something that comes directly from the actual actors of adaptation. This presents a uniquely deep avenue for analysis of adaptation, which is what this thesis has aimed for.

Lastly, the width of the analytical material in this thesis does not allow for any certain ‘proof’ of exactly what is the ‘problem’ and what can be the ‘solutions’. If this thesis was to be developed into a larger piece of work, similar methods could be employed, but on all municipalities in Sweden, and deeper interviews with CAB and Transport administration personnel. That would present a more accurate picture of the field of climate adaptation in Sweden.

7. Conclusion

Climate adaptation work is highly context-specific and is shaped differently across the world. In Sweden, one of the countries that has (had) the reputation and ambition to be a climate leader, internal climate work is rarely scrutinized. This thesis dived deep into the Swedish governance of climate adaptation and analysed collaboration avenues and structures across Sweden, both administratively and geographically, and the conclusions that can be drawn are somewhat troublesome. Sweden is fragmented, is lacking structured collaboration avenues, and actors treat adaptation work as different things in different places. The way in which adaptation is framed in Sweden depends on where you are and who you ask. There is no clear goal of Swedish adaptation work nationally, something that inhibits the key actors (municipalities and CABs), to properly perform their tasks.

There are three key findings of this thesis. First, the way in which adaptation work is structured in Sweden differs depending on where one is and who one asks, why this is the case is completely unclear. This thesis has discussed and attempted to reason as to why adaptation can be a part of spatial planning, risk preparedness, environmental strategy, etc. without any logically sound explanation as to why a certain structure is put in place. With all of the different structures between the different key actors, collaboration seems inefficient. The municipalities included in this thesis highlights different actors as key collaborators, and even though several of them say that they have projects with neighbouring municipalities, this does not seem to spill-over into an aspect that is critical to adapt, long-term, and is everywhere in Sweden. Transport infrastructure seems to be a somewhat forgotten field within adaptation. The Transport administration has their own adaptation plan where they highlight the necessity of collaboration and the need for adaptation to be integrated everywhere, yet this is completely lacking in the 'samrådsredogörelser' analysed in this thesis. It seems as if adaptation is not yet properly integrated into the current institutionalized governance processes.

Second, SMHI and MSB holds substantial power within the framing of adaptation in Sweden. SMHI is responsible for several key aspects of the climate adaptation work as laid out in the Climate Ordinance, while MSB controls the largest non-municipal adaptation fund. Since MSB is an entity that focuses on risk and preparedness, that they have a say in adaptation questions makes sense. Although, what they also contribute with are rules and structures aimed at technical risk reduction as the only way to receive funding for adaptation. This shapes the perception of which adaptation options that are available as cleverly built-up engineering feats that will protect us for adaptation, and not any changes to a system reliant on unsustainable acts. SMHI also shapes adaptation options in a more technical oriented direction. Through

emphasizing models, releasing more and more advanced forecasting programs SMHI is perpetuating the belief that what is needed is more accurate and reliable information and knowledge to cope with climate change. This overshadows the societal, holistic changes that are needed. Furthermore, SMHIs responsibility to follow up on adaptation work and report this to the government is the only avenue through which government takes stock of how adaptation is progressing in Sweden. Only one out of twelve municipalities said that it is through SMHIs software that they follow up on adaptation, which is a glaring signal about the lack of information flows between governance levels.

Third, holistic climate adaptation is mainly a concern for academics in Sweden. Certain pilot programs of how to plan with uncertainty and robustness have been tried, but as of yet these do not seem to have spread to any significant extent. This thesis highlights the fact that very few municipalities work with robust or uncertainty concepts within climate adaptation, an aspect that shows the lack of focus on holistic adaptation. The lack of holism has a plethora of explanations, the lack of guidance in the legislative system, the fragmented financing options, the absence of national adaptation goals, the multitude of organizational structures among key actors, etc. The avenues to overcome this fragmentation is to integrate long-term adaptation thinking into all segments of society in general, and governance especially. Preferably this includes embracing uncertainty, not only on a conceptual level, but through legislation and financing measures as well.

The results of this thesis point in several directions without the possibility of making any conclusive arguments. The organizational structures differ, but with no discernible reason as to why. One cannot help but wonder how the decisions to put in place a certain structure for coping with climate adaptation are made. Moreover, the power within Sweden's adaptation governance is spread among a multitude of actors, some of which are not even mentioned in the landmark Climate Ordinance. Lastly, which actors that are key for municipalities to collaborate with is quite unclear due to the lack of clarity and guidance from national policies and strategies.

I wish that I could say that the results in this thesis are conclusive and here is the solution, but as with most research done in a field that is relatively new, especially one where the legislation and responsibilities is complicated to say the least, there are several avenues which future research could/ought to pursue. For example, developing this method to a larger sample size in order to establish more confidently what the problems seems to be in the internal governance of adaptation. Such an approach could shed light on aspects that this thesis has either assumed or missed out on. More specifically this would tease out a more precise picture of how many different municipalities have structured adaptation work, broaden the field of key

collaborators, and be able to point to regional similarities and discrepancies. Alternatively, to develop other methods with slightly different material to gain further and broader understanding of the obstacles and solutions to a more holistic approach to adaptation. For example, conducting in depth interviews with adaptation workers across Sweden to gain a deeper understanding of collaboration avenues, on not only an institutional level, but on an individual level as well. More thoroughly investigate holistic adaptation approaches that has been utilized by municipalities through a deeper reading of their strategies and approaches.

In conclusion, adaptation work in Sweden needs guidance and clarity to become more holistic. It needs legislation and policy changes so that solutions become more accessible for key actors. It needs a shift away from purely technical approaches to be able to embrace uncertainty and plan long-term.

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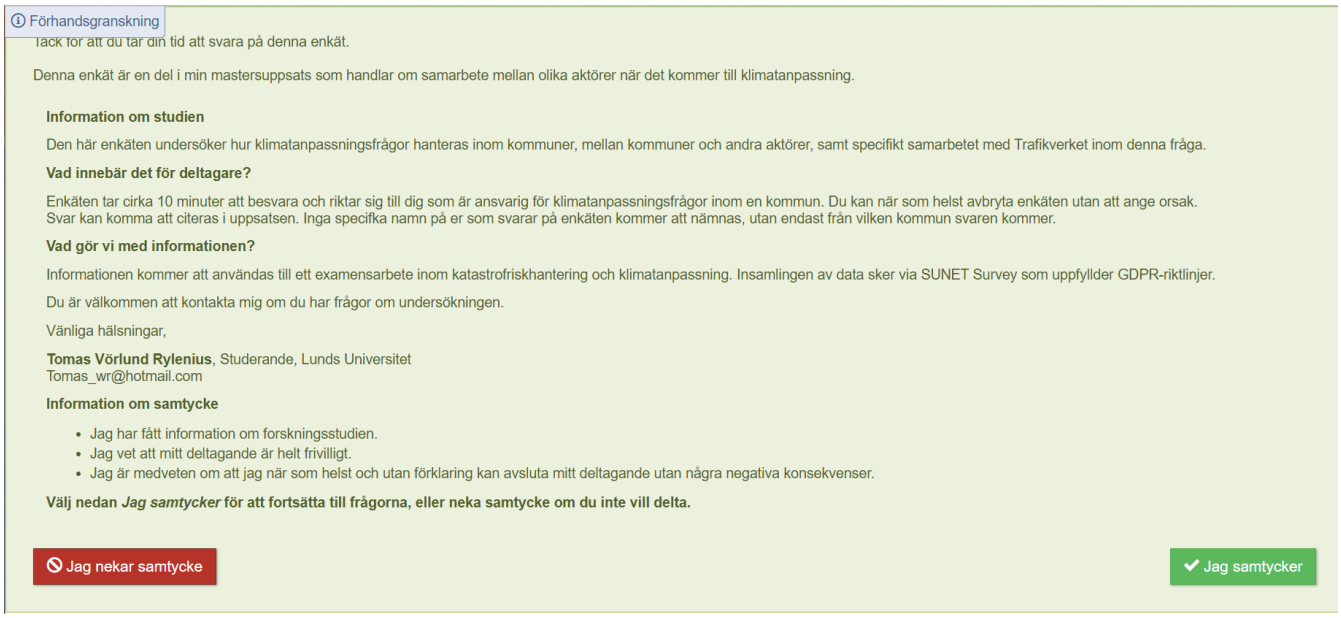
9. Appendix A – Questions in the survey

Appendix A contains the survey that was sent out to 21 municipalities.


Förhandsgranskning

Tack för att du tar din tid att svara på denna enkät.

Denna enkät är en del i min mastersuppsats som handlar om samarbete mellan olika aktörer när det kommer till klimatanpassning.

Information om studien

Den här enkäten undersöker hur klimatanpassningsfrågor hanteras inom kommuner, mellan kommuner och andra aktörer, samt specifikt samarbetet med Trafikverket inom denna fråga.

Vad innebär det för deltagare?

Enkäten tar cirka 10 minuter att besvara och riktar sig till dig som är ansvarig för klimatanpassningsfrågor inom en kommun. Du kan när som helst avbryta enkäten utan att ange orsak. Svar kan komma att citeras i uppsatsen. Inga specifka namn på er som svarar på enkäten kommer att nämnas, utan endast från vilken kommun svaren kommer.

Vad gör vi med informationen?

Informationen kommer att användas till ett examensarbete inom katastrofriskhantering och klimatanpassning. Insamlingen av data sker via SUNET Survey som uppfyllder GDPR-riktlinjer.

Du är välkommen att kontakta mig om du har frågor om undersökningen.

Vänliga hälsningar,

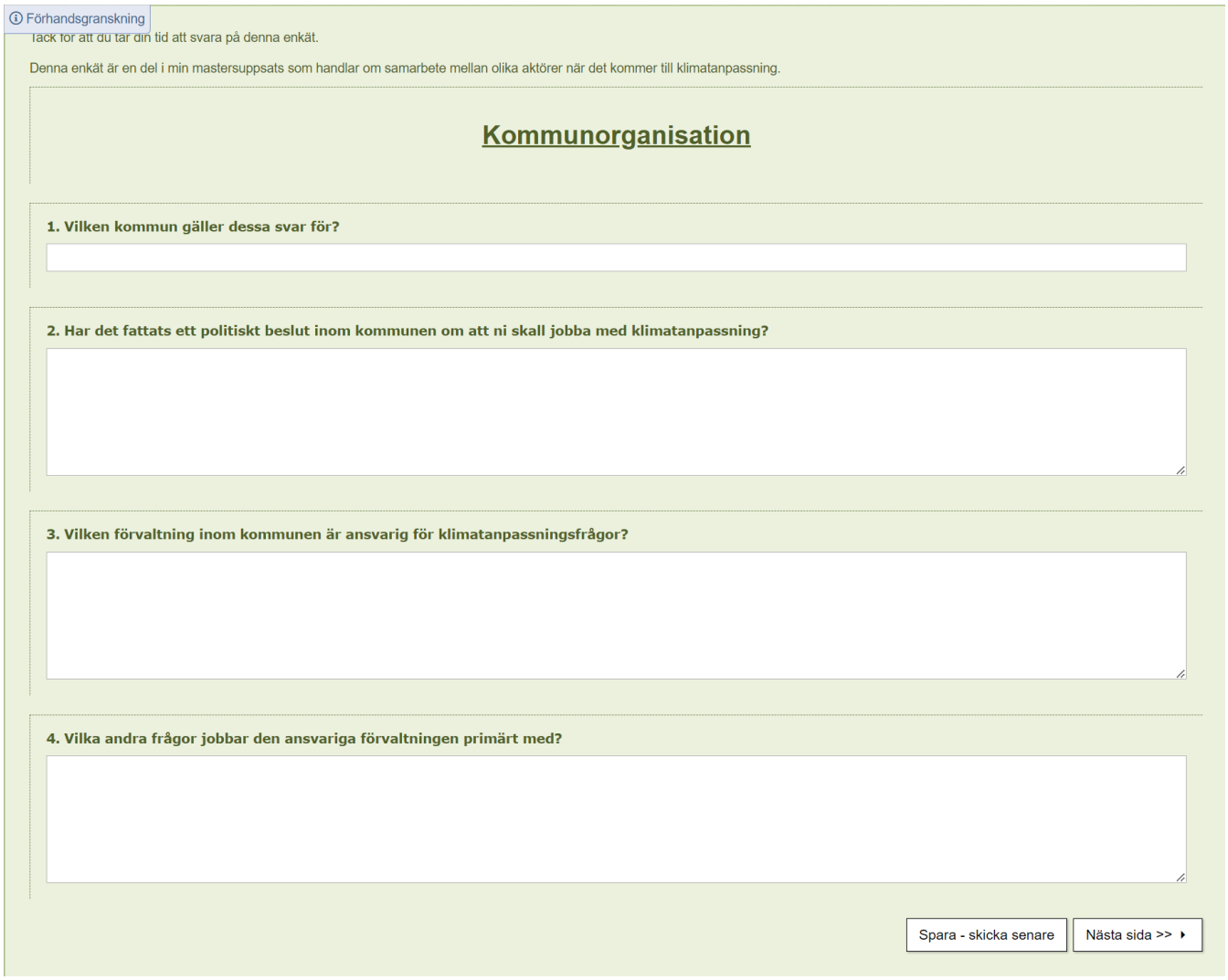
Tomas Vörlund Rylenius, Studerande, Lunds Universitet
Tomas_wr@hotmail.com

Information om samtycke

- Jag har fått information om forskningsstudien.
- Jag vet att mitt deltagande är helt frivilligt.
- Jag är medveten om att jag när som helst och utan förklaring kan avsluta mitt deltagande utan några negativa konsekvenser.

Välj nedan *Jag samtycker* för att fortsätta till frågorna, eller neka samtycke om du inte vill delta.

Jag nekar samtycke | Jag samtycker


Förhandsgranskning

Tack för att du tar din tid att svara på denna enkät.

Denna enkät är en del i min mastersuppsats som handlar om samarbete mellan olika aktörer när det kommer till klimatanpassning.

Kommunorganisation

1. Vilken kommun gäller dessa svar för?

2. Har det fattats ett politiskt beslut inom kommunen om att ni skall jobba med klimatanpassning?

3. Vilken förvaltning inom kommunen är ansvarig för klimatanpassningsfrågor?

4. Vilka andra frågor jobbar den ansvariga förvaltningen primärt med?

Spara - skicka senare | Nästa sida >>

Förhandsgranskning

Samarbete inom klimatanpassning

5. Samarbetar ni med aktörer utanför kommungränserna när det kommer till klimatanpassningsfrågor? Ifall JA, på vilket sätt?

6. Vilka aktörer som inte är er egen kommun är viktigast för er när det kommer till klimatanpassning?
Det kan vara aktörer som är privata, kommunala, regionala, eller statliga, som stödjer er med information, finansiering, organisering, expertis, underlag, utredningar, etc.

7. Vilken aktör utanför er egen kommun har ni mest frekvent samarbete med när det kommer till klimatanpassning?

8. Har ni samarbetat med Trafikverket när det kommer till klimatanpassning? Antingen inom ramen för något projekt eller inte. Ifall inom ett projekt, vilket projekt?

9. Samarbetar ni med Trafikverket regelbundet i andra frågor än klimatanpassning?
Ifall ja, vilka frågor?

Förhandsgranskning

Tack för att du tar din tid att svara på denna enkät.

Denna enkät är en del i min mastersuppsats som handlar om samarbete mellan olika aktörer när det kommer till klimatanpassning.

Uppföljning och metod

10. Har ni genomfört några klimatanpassningsåtgärder, eller planerat för någon typ av klimatanpassning, som korsar kommungränserna? T.ex längs en flod, en väg, en järnväg, ett skogsparti, en bro, någon typ av industri, etc.

11. Följer ni upp klimatanpassningsåtgärder på något vis? Ifall Ja, hur?

12. Vilka lagar, regler, utredningar, policys, strategier, planer, är de viktigaste för er när det kommer till klimatanpassning?

13. Har ni jobbat någonting med 'Robusta Beslutsmetoder,' 'Dynamic Adaptive Policy Pathways', 'Climate Risk Informed Decision Analysis'? Ifall ja, inom vilket projekt?

10. Appendix B – County Administrative Board structures

Appendix B contains all 21 County Administrative Boards organizational charts.

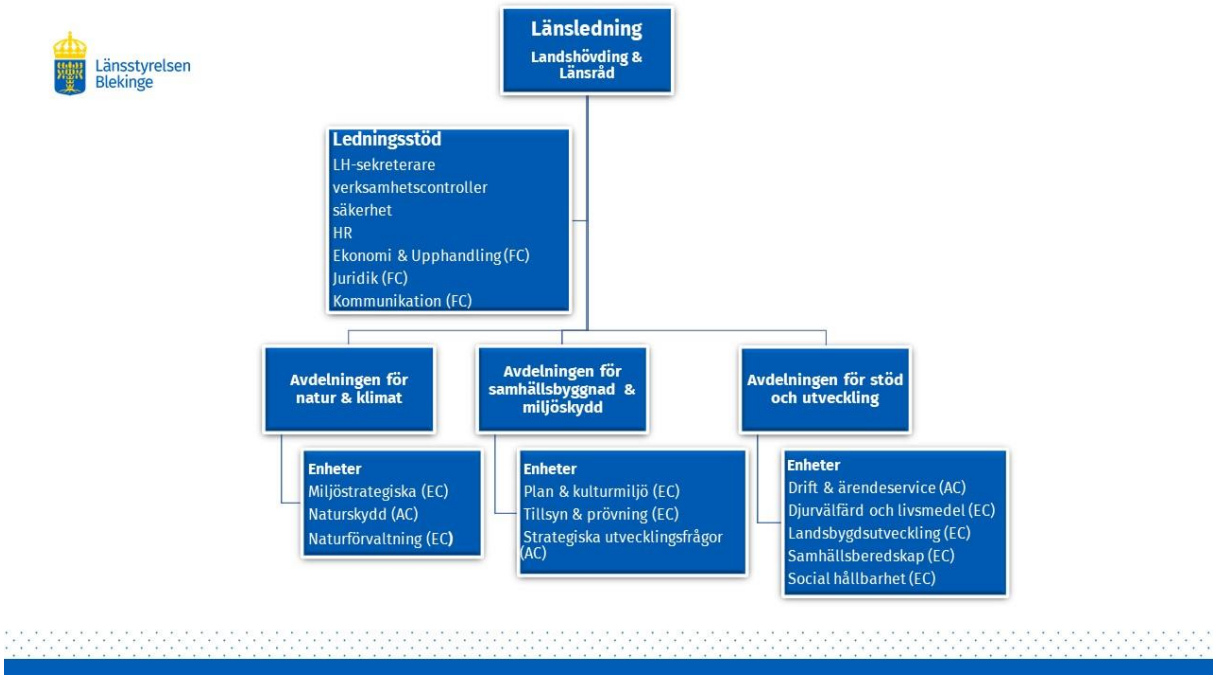


Figure 5 Blekinge organizational chart

Figure 6 Dalarna organizational chart

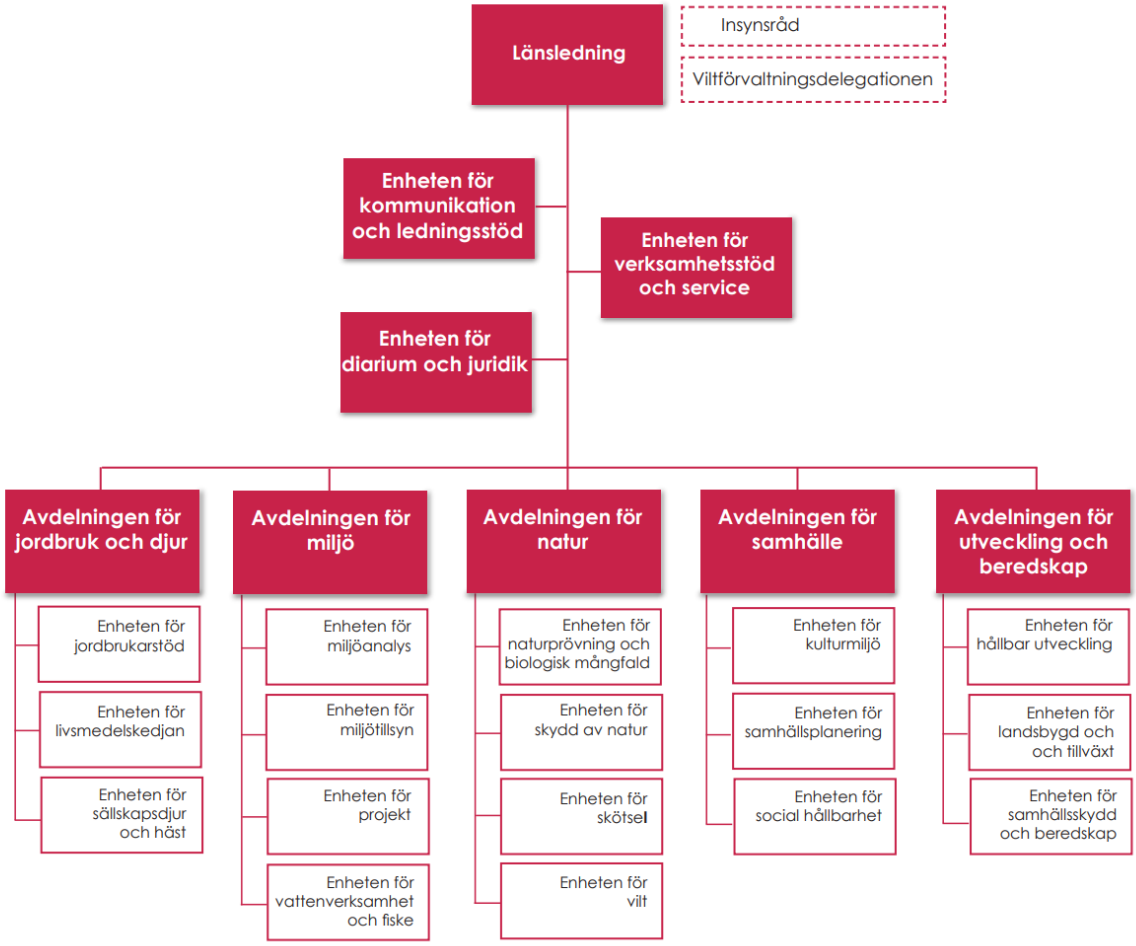


Figure 7 Gävleborg organizational chart

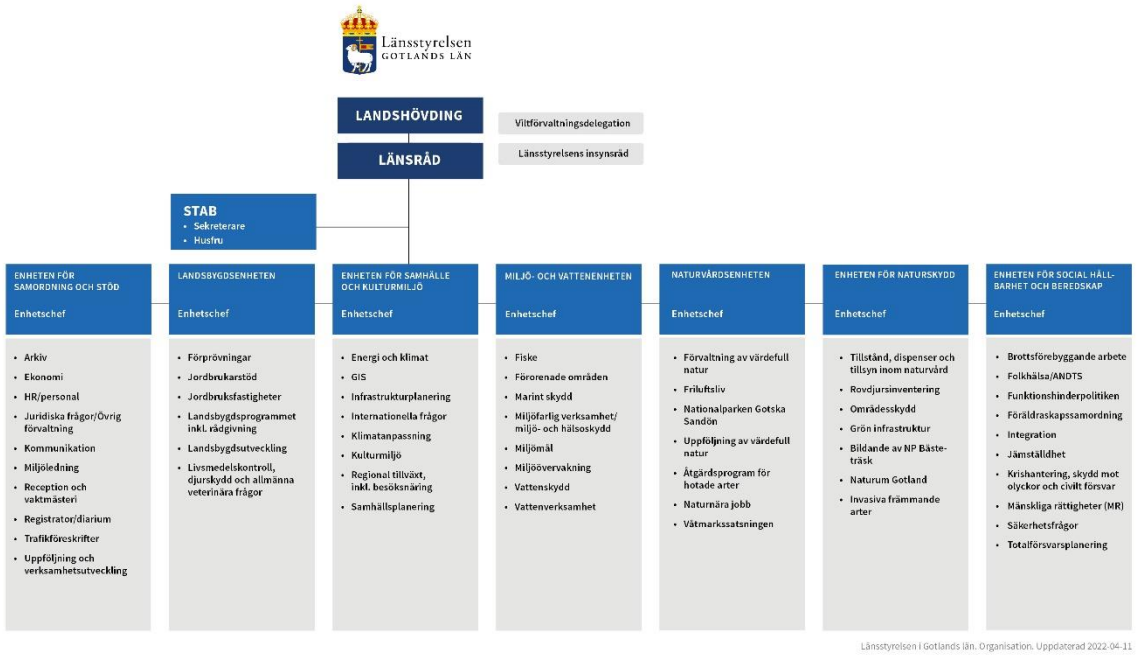


Figure 8 Gotland organizational chart

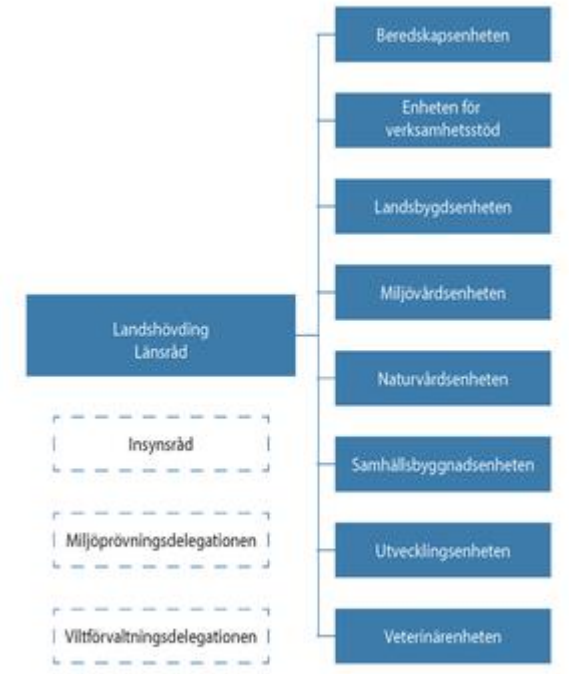


Figure 9 Halland organizational chart

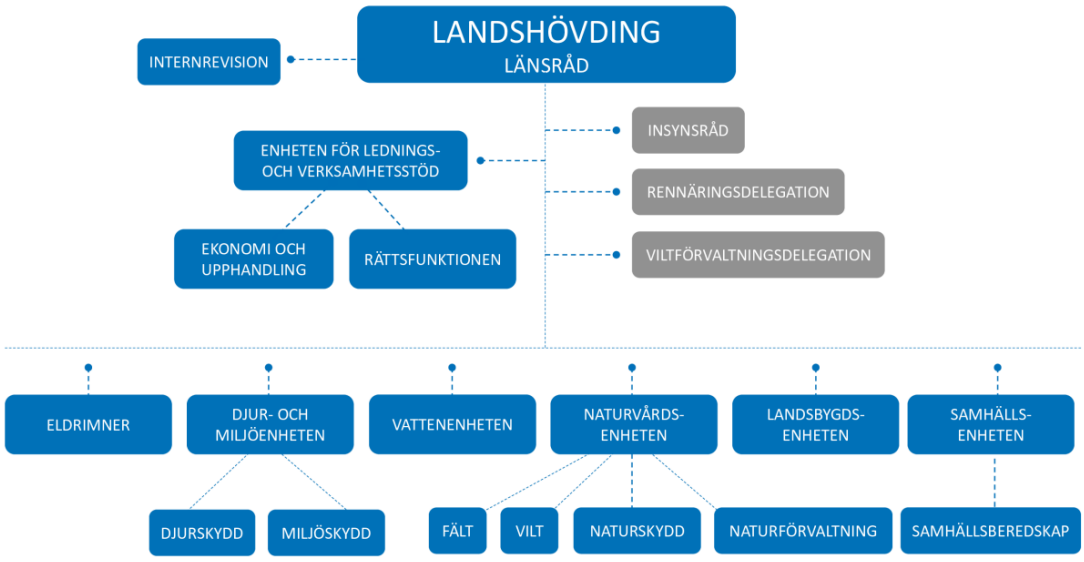


Figure 10 Jämtland organizational chart

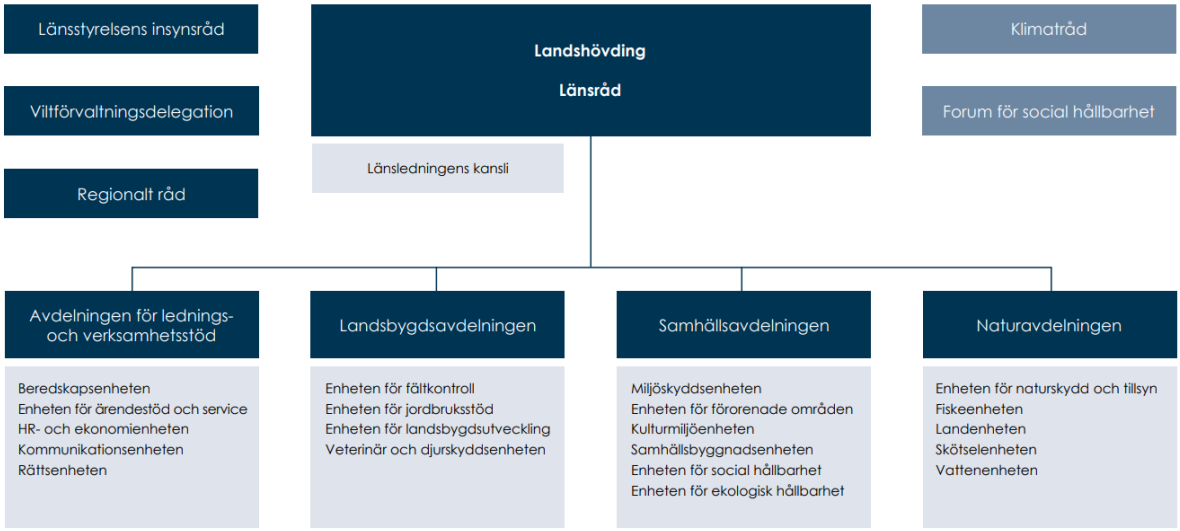


Figure 11 Jönköping organizational chart

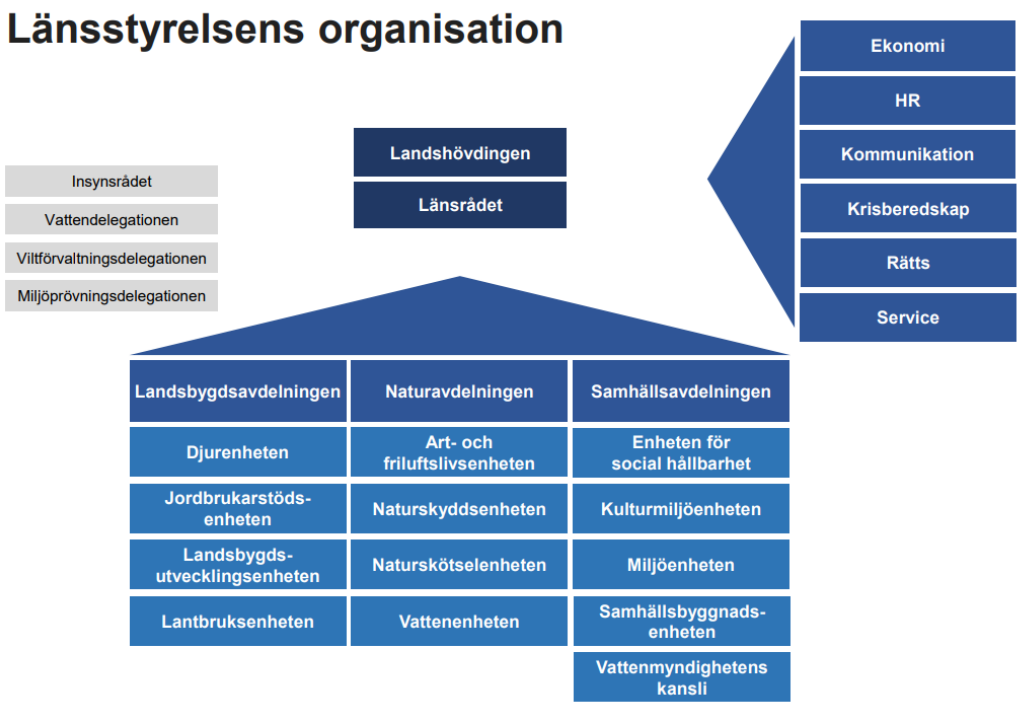


Figure 12 Kalmar organizational chart

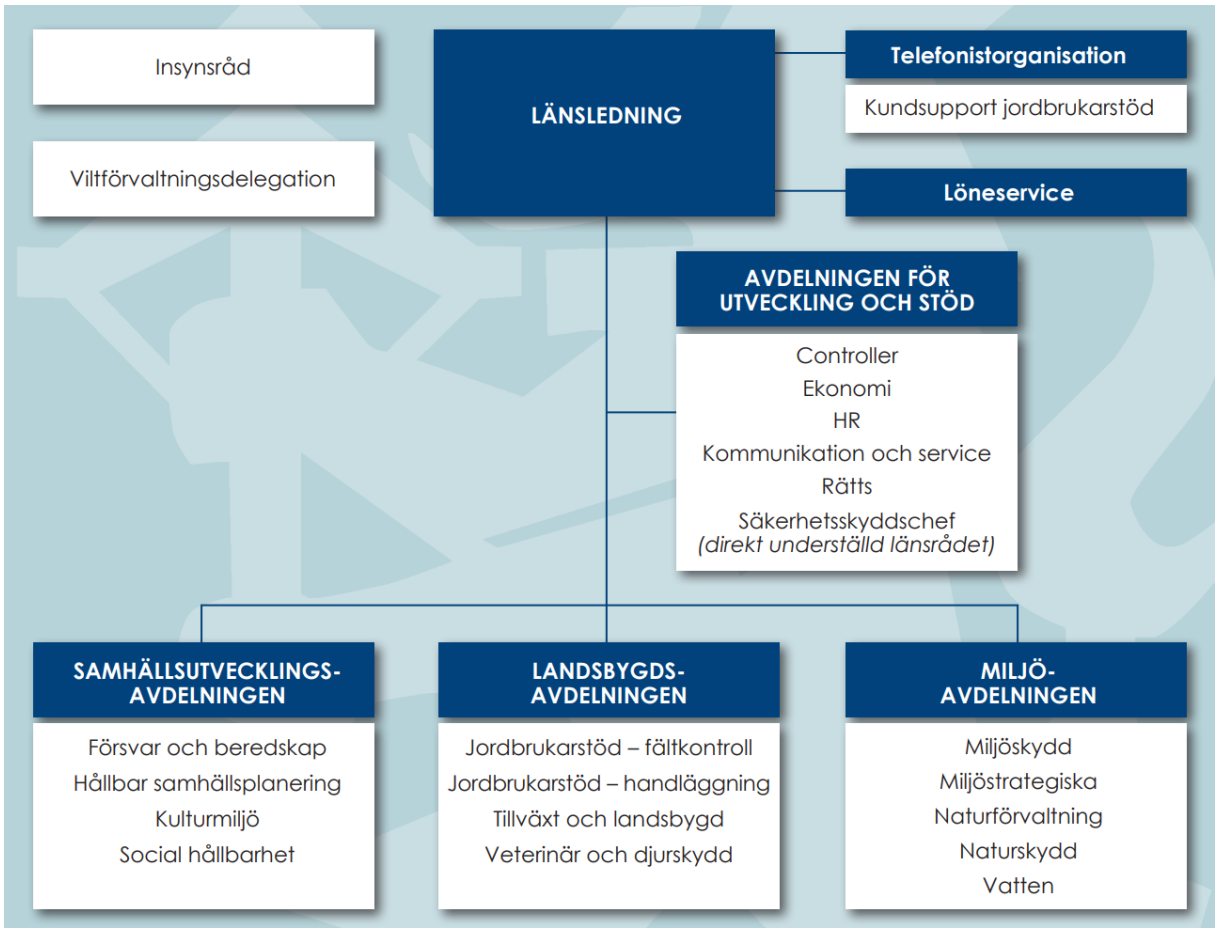


Figure 13 Kronoberg organizational chart

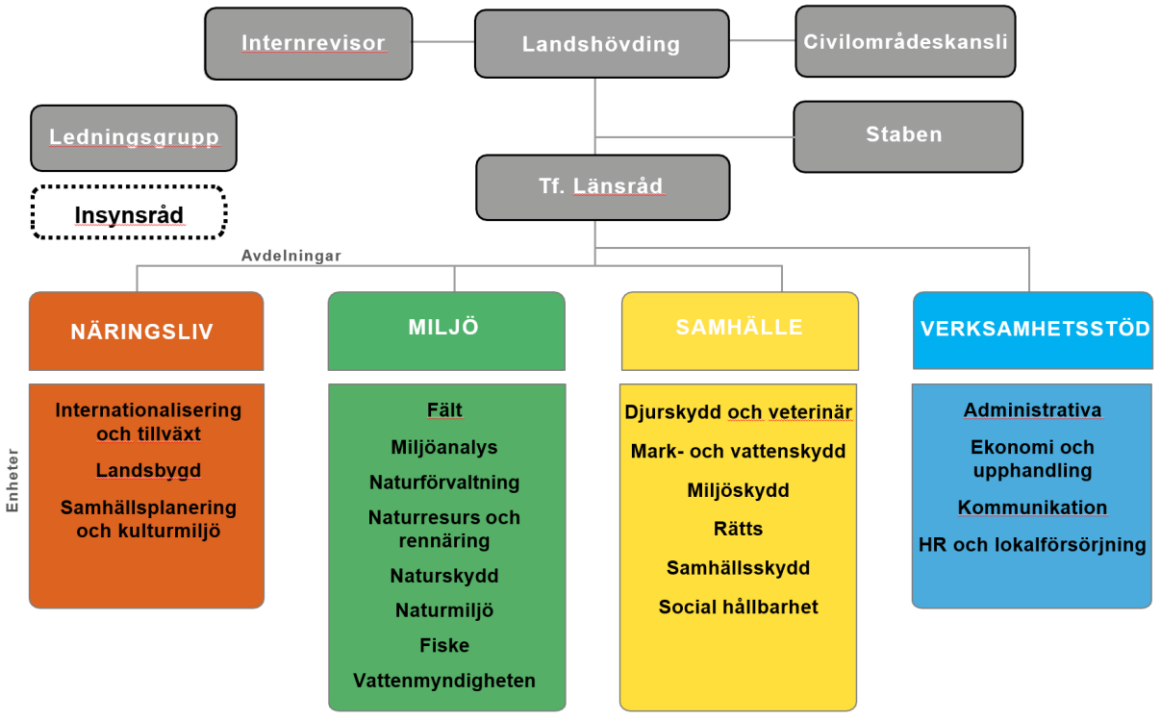


Figure 14 Norbotten organizational chart

Figure 15 Örebro organizational chart

Figure 16 Östergötaland organizational chart

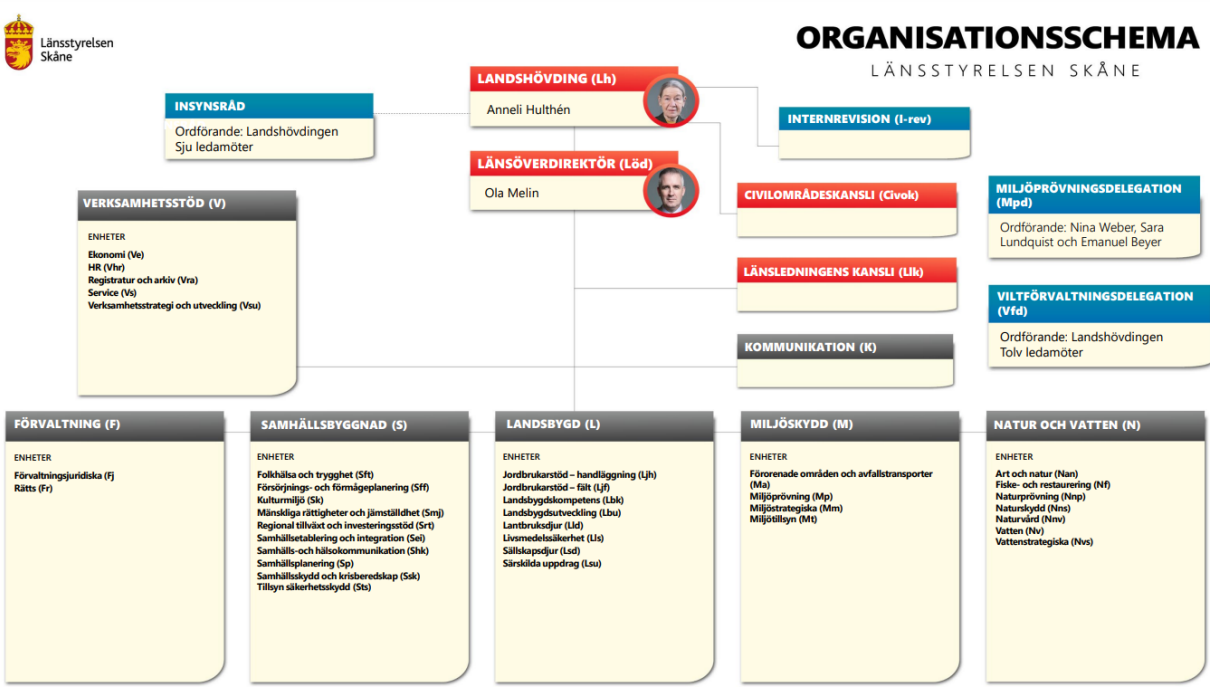


Figure 17 Skåne organizational chart

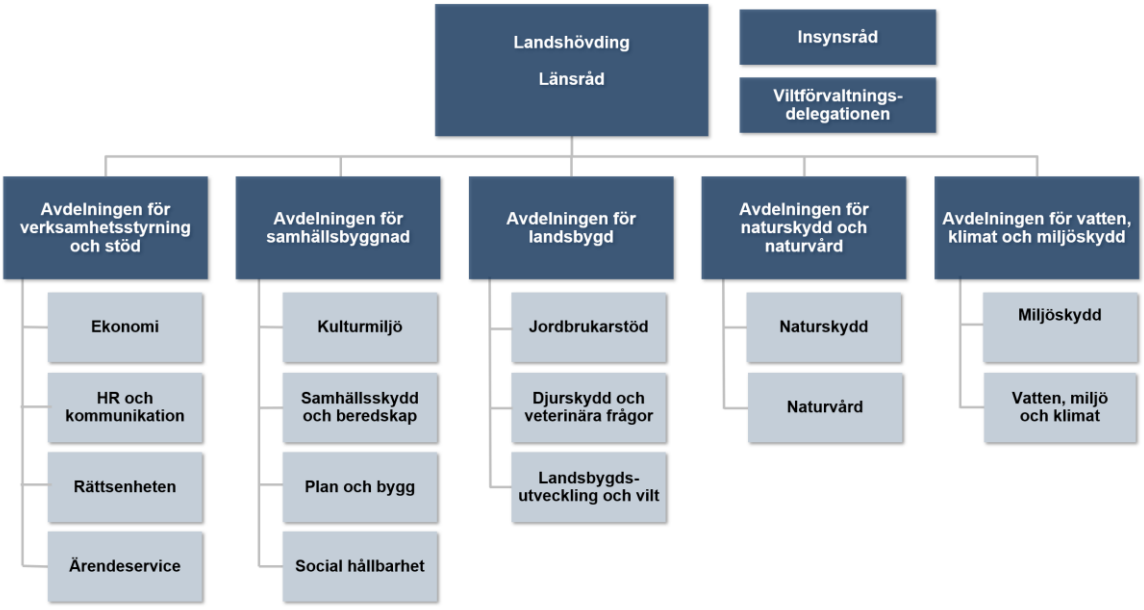


Figure 18 Södermanland organizational chart

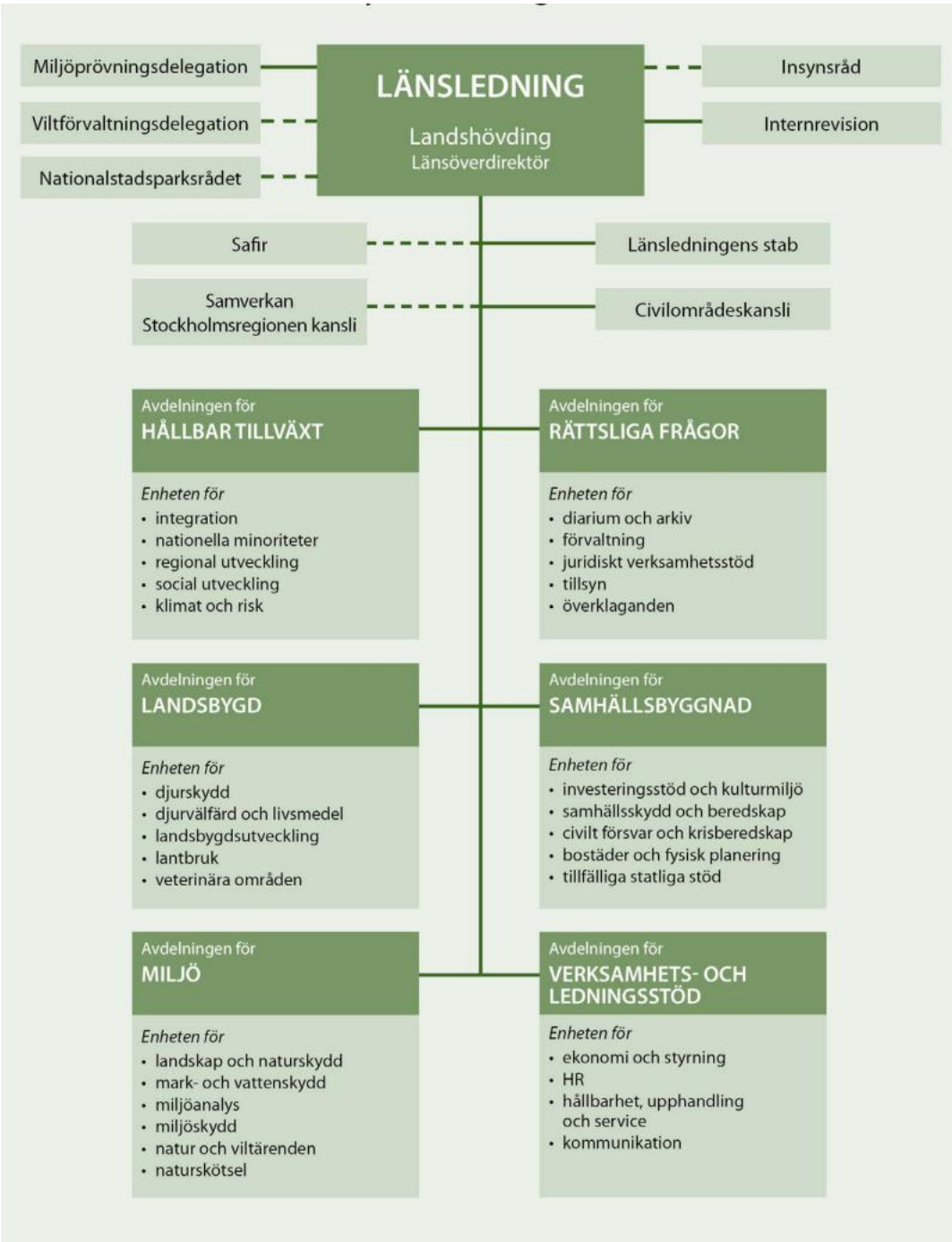


Figure 19 Stockholm organizational chart

Figure 20 Uppsala organizational chart

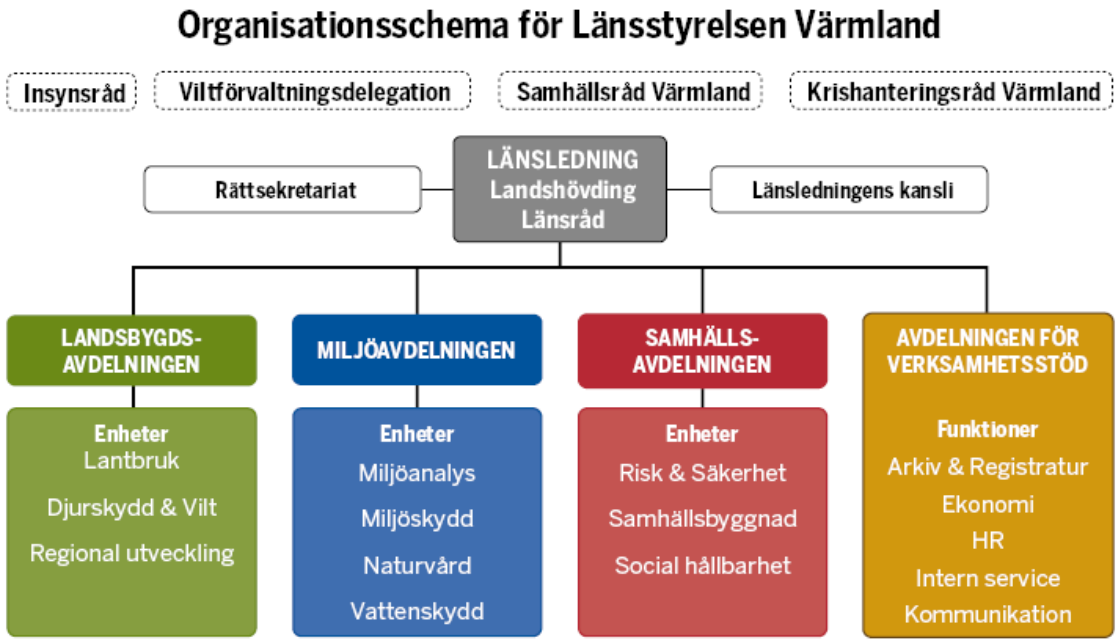


Figure 21 Värmland organizational chart

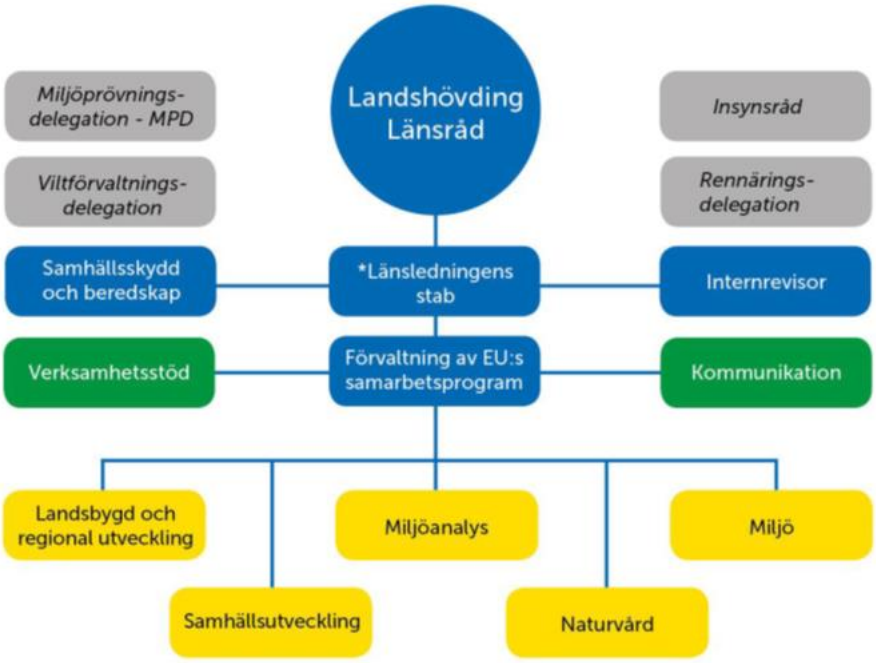


Figure 22 Västerbotten organizational chart

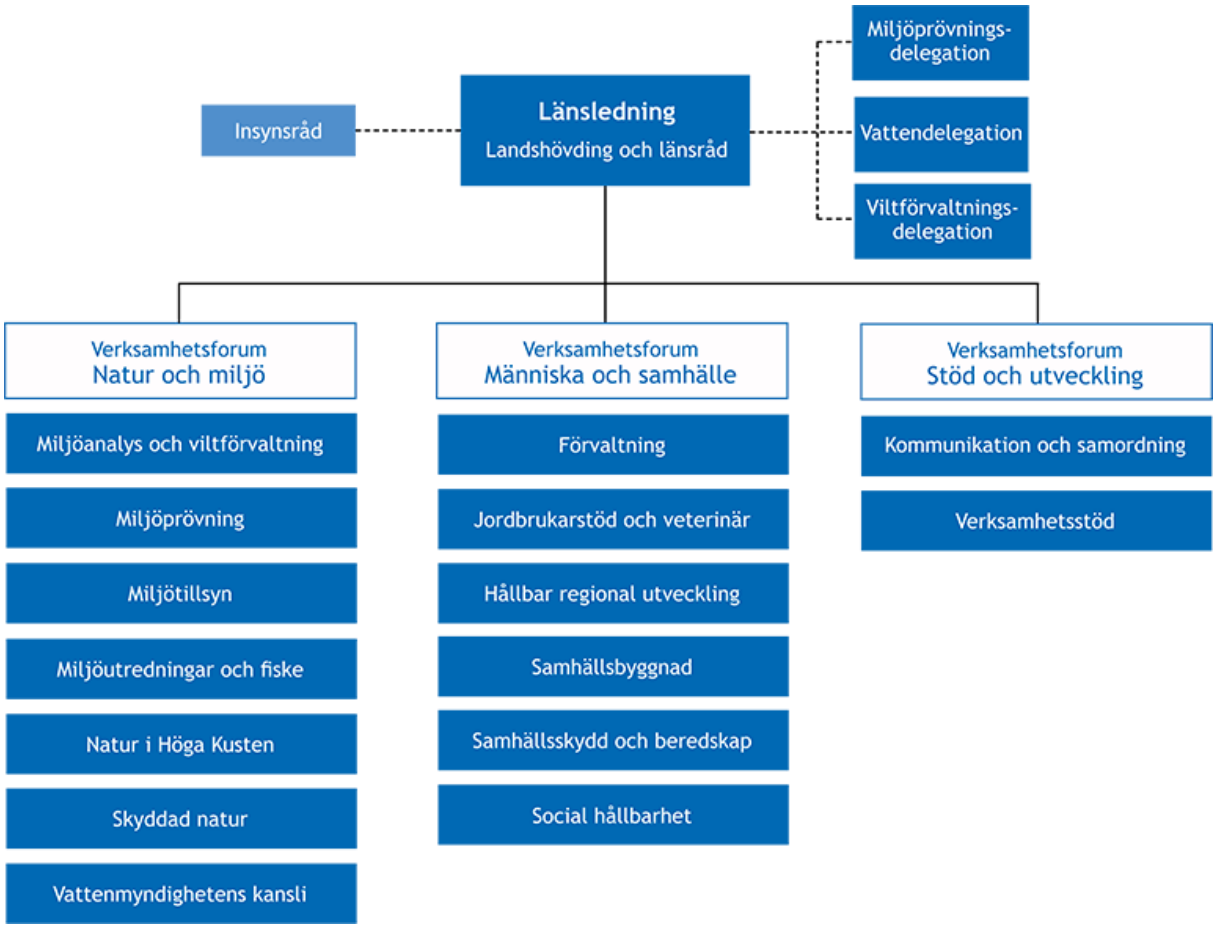


Figure 23 Västernorrland organizational chart

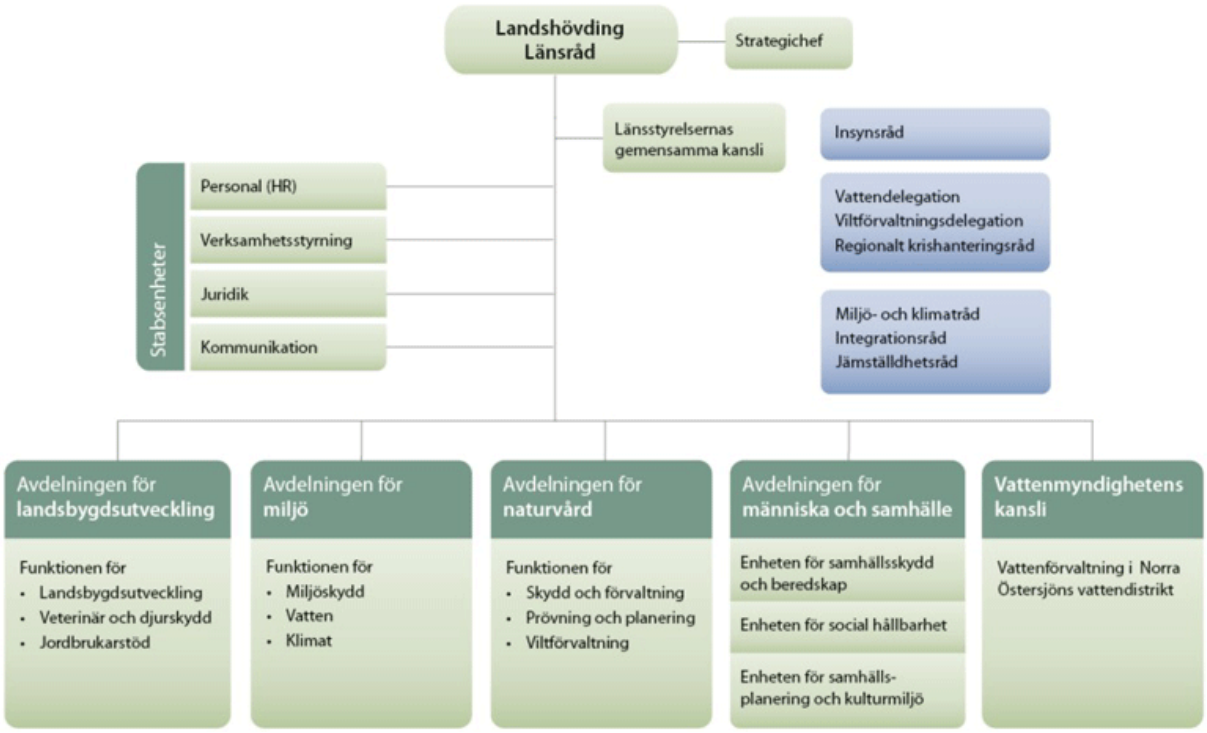


Figure 24 Västmanland organizational chart

Figure 25 Västra götaland organizational chart

11. Appendix C – 'Samrådsredogörelser'

Appendix C contains all 'samrådsredogörelser' from the Transport administration that is included in the Thesis.