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Policy Coordination for National Climate Change Adaptation in Europe: All Process, but Little Power

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Abstract: Climate change adaptation (CCA) is argued to require coordinated policy responses because it is a complex, long-term, knowledge intensive, cross-sectoral, and multi-level governance challenge that involves many interdependencies and actors with different perceptions, goals, and approaches. This study, therefore, examines approaches of a set of European Union (EU) member states (Denmark, Finland, Germany, Italy, the Netherlands, and the United Kingdom (England)) to pursue a more coordinated approach to CCA policy. It specifically addresses the co-ordination approaches that the selected countries use for the development and implementation of their national CCA policies in the immediate period following the publication of the EU's 2013 Adaptation Strategy. The analysis demonstrates that while useful coordination processes have been established in the analyzed EU member states, they have difficulty in challenging existing institutional hierarchies and decision rules. Consequently, longer-term opportunities for managing CCA conflicts and synergies among sectoral policies have to date been limited.

Keywords: climate change adaptation; policy coordination; policy integration; European union; European Union member state; adaptation strategy

1. Introduction

Climate change adaptation (CCA) is an increasingly important policy agenda aiming to make natural and social systems less vulnerable to the actual and expected impacts of climate change. While national level adaptation processes in the European Union (EU) have increasingly become

the focus of research (e.g., see [1–7]), the important issue of coordination has yet to be extensively covered in the existing literature, see though [2,8]. Policy coordination is a critical issue because CCA represents a complex, long-term, knowledge intensive problem, which poses a significant cross-sector and multi-level decision-making challenge. While appropriate responses in relation to CCA are often related to the specific risks and vulnerabilities in local contexts, action in one sector or locality can have negative spillovers in another, e.g., flood projects in one location may make areas up or down stream more vulnerable to flooding [9]. This suggests that the design and implementation of effective CCA policies require processes to help coordinate adaptive responses to climate change across multiple policy sectors and tiers of government [10,11].

This study draws on the policy coordination and policy integration literature, e.g., see [8,11–15], and empirical observations to examine the administrative coordination elements for CCA policies in a selection of European Union Member States during 2014–2018—a critical period during which CCA policy in EU member states was being pursued with renewed vigor following the publication of the EU Adaptation Strategy [16]. The EU Adaptation Strategy was a "communique", a relatively soft piece of policy offering principles and recommendations, but also best practice guidelines for more coordinated action on CCA policy approaches. Thus, while the EU Adaptation Strategy could not prescribe actions to member states, it did make a number of recommendations around a series of six steps [16]: (1) for countries without a pre-existing approach, preparing the ground for adaptation; and then the following recommendations for all member states; (2) assessing climate change risks and vulnerabilities; (3) identifying adaptation options; (4) assessing adaptation options; (5) implementation; and (6) monitoring and evaluation. Steps 2–6 are meant to be iterative and strongly interlinked. These steps are intended to "advance a common understanding [among member states] of important aspects relevant to any adaptation process" ([16], p. 7).

The strategy has recently been evaluated, concluding that the "Commission's guidance produced under the strategy helped coordinate national sectors and policies ([17], p. 9). The detailed report also concluded that "[t]he lack of coordination within Member States suggests that there is a need for further action to help administrations overcome behavioral and other barriers to coordination." ([18], p. 57). This motivates further analyses of the coordination process, and this study addresses the questions: (1) What are the main elements making up the administrative approaches for CCA policy coordination processes in the studied countries? (2) To what extent are these approaches actually operating to deliver more coordinated CCA policy approaches, and what lessons can be learnt from this? In so doing, this paper does not focus on policy outcomes (e.g., whether coordination processes have actually led to more adaptation policies), which would be difficult to establish because of the counterfactual of whether or not a policy outcome would have occurred in the absence of a national adaptation policy, and instead considers the process of CCA policy coordination in the studied settings [13]. The study investigates how policy coordination operates between sectors and across scales as well as also exploring the institutional and political space for actors to perform the necessary transformations for CCA, in the context of decision rules and hierarchies [15].

The paper maps out as follows. First, the conceptual framing of the paper is explored through a review of the policy coordination literature. Second, the research approach is outlined. Third, the findings are relayed to provide an account of the CCA policy coordination approach for each of the studied countries. Fourth, the impact of the CCA policy coordination is examined in the context of how it engages with existing institutional arrangements and lessons learnt. Finally, conclusions are drawn, and future research directions are identified.

2. Policy Coordination Approaches and Processes

Debates around coordination approaches are often framed around the use of more planning or learning-based elements [19,20]. Planning approaches encompass action from the center of government, which seek to minimize the discretion of national policy-makers, sectoral and/or local policy makers, and other actors when dealing with cross-cutting issues, through, for example, setting targets and objectives

to be met (i.e., it is a more hierarchical approach). Coordination through planning may be important for ensuring that an issue such as CCA has the appropriate level of financial and political support. However, strict planning-based approaches may be too rigid as appropriate responses to a changing climate are often very specific to a given sector, locality, and governance context [10]. By contrast, "learning approaches" encourage learning amongst stakeholders and actors in central government, the sectors, and lower governance levels, fostering common notions about action rather than prescribing action. Learning is thus a less hierarchical approach to coordination [19–21]. Coordination through learning allows for greater flexibility, but with less guarantee that cross-cutting goals will be adhered to; even if they are, responses may conflict with wider policy goals, and potentially exacerbate policy coordination problems. We take the view that that these coordination approaches are not necessarily opposing and can co-exist to complement each other within a broader coordination strategy see also [20–22].

There is also the consideration of how the different elements of the coordination process operate. The literature on coordination (e.g., [14,15]) tends to conceptually deal with this issue in terms of notions of negative and positive coordination. Put simply, negative coordination is about finding an agreement on how to avoid interference and conflict. Negative coordination often manifests in non-hierarchal approaches, as policy actors seek to avoid negative impacts on each other [14,15]. In such situations, coordination is likely to be less strategic and more piecemeal as different actors seek 'clearance negotiations' [15] to help them rub along together and avoid conflict, rather than pursue broader cross-cutting objectives strategically. By contrast, positive coordination involves multilateral negotiations that must jointly consider the policy options of all involved parties to agree on the contents of policies and resolve conflicts over distribution of resources. Positive coordination is more strategic in outlook in terms of achieving cross-cutting policy goals, such as CCA, rather than conflict avoidance. However, as Peters ([14], p. 20) explains, the "positive conception of coordination is much more difficult to achieve than negative coordination. Positive coordination may require the actors involved to give up some of their own policy goals, and almost certainly some of their preferred ways of achieving those goals." This underlines that positive coordination can arise when all actors also see wider common goals or share awareness of a common objective, such as responding to climate change. Alternatively, a strong hierarchical steer or a threat of one may be required [15]. It is also worth noting that positive coordination is not necessarily positive in the sense of the more of it, the better. Indeed, it can be argued that positive coordination is only necessary if conditions are critical enough to warrant very large resources being devoted to coordinating negotiation and decision making on a specific issue. When only modest, or very sector specific resources are sufficient, then "deep positive" coordination may do more harm than good, because of the transaction costs involved (e.g., the significant investment of time and resources). This is an issue we return to later in the paper.

This research considers whether the coordination approaches in selected EU member states foster positive or negative policy coordination processes, and what this implies for the CCA challenge. Crucially, in determining how processes may facilitate more negative or positive coordination, the role of formal and informal institutional rules, and associated embedded hierarchies and resources, must be considered [14,15]. Therefore, when considering how CCA coordination approaches promote positive or negative coordination, we consider how different elements of the coordination approaches interact with the broader institutional dynamics within the political systems. This is particularly important for CCA, because it is a relatively new policy agenda focusing on longer-term social benefits. This means that CCA has to compete for resources (organizational and financial) against more established, high profile, and immediate agendas (e.g., fiscal policy, employment). Crucial in this context is the level of authority vested in the coordination procedures of CCA to shape the actions of institutional actors, who have other interests and priorities. Such authority manifests, for instance, in the organizational and financial resources provided to facilitate the process, legal authority, and high-level political support from the executive, and the prospect of hierarchical imposition (i.e., under the shadow of hierarchy) [14,15,22].

3. Research Approach

Data were collected through a two-step approach for the study period 2014−2018. This represented a critical time in the development of CCA policy coordination in the EU, as only a year earlier (2013), the Commission published the EU Strategy on Adaptation to Climate Change [16], and began a review of this strategy in 2018. Our intention was to examine this critical phase in adaptation policy development to gain insights into, and lessons for, policy coordination processes in Europe. A documentary analysis was conducted to record broad patterns of interest. Documents considered in the analysis included official government documents, parliamentary reports, and external critiques from the studied countries. Once the documentary records were established, gaps in the data were addressed through 25 expert interviews, covering key people responsible for CCA policy in the studied countries, the European Commission and European Environment Agency. Interviews provided data on issues, events, and perceptions related to CCA policy and planning that were not represented—or represented ambiguously—in the analyzed policy documents.

In line with qualitative case research, we sampled a small group of EU Member States to allow for a deeper analysis of the how the EU Member States are strategically engaging with the Climate Adaptation challenge [23]. In so doing, we have a purposive sampling strategy, [23] which, in step with our research questions, sought to put a spotlight on some administrative factors that are relevant to the coordination of CCA policy, rather than generalizing about the factors that lead to policy coordination. Data were collected for six EU countries: Denmark, Finland, Germany, Italy, the Netherlands, and England (adaptation in the United Kingdom is a devolved policy, but the peculiarities of devolution meant English adaptation policy was the responsibility of the United Kingdom Government). Each of these countries had an explicit aim to strategically coordinate CCA across policy sectors. The cases for this study were selected using a most different case strategy [23], within the context that they are all EU Member States and that it is a new policy area for the European Commission. The selection covered different political and geographical features such as: political structure and culture, e.g., federal (Germany) and non-federal political systems (Denmark) and consensual (Netherlands, Finland, and Denmark) vs. conflictual (England); reported leaders (e.g., Denmark, Finland, England) and laggards (e.g., Italy); and geographical spread across northern and southern European countries to account for different types of climate impact vulnerabilities. Most of the selected member states had already developed or were developing approaches for CCA policy coordination, horizontally across sectors and vertically between governance levels [2], with only one of our studied countries (Italy) directly developing their CCA policy alongside the EU's intervention. However, the European Adaptation Strategy and its development over many years still had some influence on all of the studied countries. Overall, this is a fairly representative spread of EU member states, but we acknowledge that the geographical coverage has some limitations, with only one southern country being represented in the sample and no eastern European countries.

We collected data by constructing a data collection framework comprising different elements that may be associated with both learning and planning-oriented policy coordination approaches (see Table 1). As a comprehensive basis for policy coordination elements, we took the EEA 2005 report on environmental policy integration and the Commission's aforementioned CCA guidelines as a starting point for our data collection framework and complemented this with relevant academic literature on policy coordination and related topics such as (climate) policy integration, e.g., see [8,11–14,24,25]. In devising the framework, learning instruments were understood to be more focused around processes to facilitate lay and expert knowledge provision and management to promote learning within sectoral policy making processes: i.e., policy appraisal processes; stakeholder engagement; and knowledge portals. Planning, on the other hand, was understood to be more related to achieving strategic goals and therefore procedures and tools that are more associated with controlling the policy agenda to meet such goals: i.e., high-level inter-ministerial committees, strong political leadership, and cross sectoral strategies and action plans. We acknowledge that some of these elements can be used or conceived differently, for instance evaluation and policy appraisal can be used as planning tools to achieve targets.

However, we have sought to broadly align the different elements to planning and learning in a manner that is consistent with the existing policy coordination literature [20,25]. In using this framework, the intention was to guide analysis of where the weight of CCA activities were placed, rather than producing a comprehensive audit of what was present in each jurisdiction.

Table 1. Key components of learning—and planning—oriented coordination approaches.

Learning Orientated Coordination		
(1) Appraisal of policy, risks, and vulnerability	Appraisal is a form of ex-ante policy analysis (e.g., regulatory impact assessment) to help policy makers learn about potential policy impacts, risks, and vulnerabilities. Appraisal facilitates also facilitates are not very well connected to the argument, I think it would make sense to be more explicit about our ta dialogue between departments through identifying policy spillovers into related sectors.	[12,20,26]
(2) Stakeholder engagement	Stakeholder engagement encourages learning through bringing outside perspectives and expertise into the decision-making processes.	[8,24]
(3) Boundary organizations, independent advisory panels	Boundary organizations and independent advisory panels sit on the interface of science and policy to manage interaction between the two fields. Through providing knowledge, expert scrutiny, and evaluation, these bodies can be important triggers of policy learning.	[24]
(4) Knowledge portals	Online knowledge portals disseminate specialists' knowledge on CCA, with a strong emphasis on learning from practices in other regions and contexts.	[2,9]
(5) Evaluation	Policy evaluation is an ex-post tool to assess performance against intended and cross-cutting goals to learn about policy effectiveness, what works and what does not, and to draw lessons for upcoming policy.	[8,24]
Planning orientated coordination		
(6) Leadership	Leadership by central political actors such as Prime Ministers, Presidents, or central government ministers, sets wider cross-sectoral plans through policy goals and objectives.	[11,13,24,25]
(7) Inter-ministerial committees	High level inter-ministerial committees are forums where ministries can coordinate shared objectives, resolve inter-ministerial differences, and monitor progress according to cross-government goals. They rely on hierarchical coordination and are thus more planning oriented.	[13,24,25]
(8) Cross-sectoral strategies	Cross-sectoral strategies seek to reinforce planned coordination by cross-cutting objectives and goals for multiple policy sectors.	[12,13,24]
(9) Action and implementation plans	Action plans pursue cross-cutting strategic goals through sectoral strategies with detailed implementation pathways.	[8,12,24]

Using the data collection framework as a guide, the documentary and interview data were analyzed through thematic analysis; a widely used approach in the qualitative social sciences [27]. Thematic analysis is a "method for identifying, analyzing, organizing, describing, and reporting themes found within a dataset" ([27], p. 2). This approach ensures researchers pursue robust and consistent strategy for sorting qualitative data [28]. In conducting the analysis, we followed established thematic analysis approaches, e.g., see [27]. First, we became familiar with our interview transcripts and re-checked them against the original recordings. Second, we established an initial set of meta codes, based on step one and our data collection framework (Table 1), to guide a more fine-grained analysis for step 3. Themes were developed in a semi structured manner. In the first instance, themes involved asserting the presence or absence of the coordination elements in Table 1. Then sub-themes were explored, such as how these elements performed and how they interacted with each other (or not) to facilitate a wider coordinated approach towards CCA policy. Moreover, in line with conceptual approach themes were also developed around the level of resources, hierarchical, and legal authority. Other themes to emerge were based around political and public administration culture (e.g., among others, formal or informal structures of conflict resolution, policy learning, state society relations, national and regional government relations), the history of CCA policy, the catalysts or motivations behind early adoption of adaptation measures. Third, we revisited the themes for a finer detailed analysis. Fourth, we finalized the themes and checked that data assigned to themes was consistent. Fifth, we documented the themes with reference to the research questions and data collection framework.

All stages were conducted by at least two researchers to provide consistency. Constancy and reliability were also aided by the strategy for selecting interviewees and documents, where a strategy was pursued to gain insights from actors and organizations with different relationships to CCA and the policy processes in the different member states and the European Commission. This allowed for different insights to be triangulated [29] within the identified themes to see where perspectives differed, collaborated, etc. [27]. In the first instance, documentary analysis aimed to record the broader picture of CCA in the studied countries. Once the documentary record was established, gaps in the record/or unclear developments were filled through interviews where needed. Moreover, interviews provided data on issues, events, and perceptions related to adaptation policy and planning not represented—or represented ambiguously—in policy documents. When triangulating between data sources, we followed the strategy of Davies ([30], p. 78), who recommends that at a minimum, two independent sources (from interviews or documents) should be sought before an item can be dealt with in real confidence. Davis describes this as a strategy "of improving the signal to noise ratio of a message by sending the same message down two redundant channels" ([30], p. 78). By this, it is meant that "the noise from each channel (interviewee) is particular to that channel but the signal is common to both, and so what they have in common is more likely to be signal than noise" ([30], p. 78). Given the word limitation of this paper and the volume of data examined, it is not possible to show the detailed triangulation process in the empirical text of the document. Instead, an overview position is presented based on the outputs of these data analysis processes.

4. National Adaptation Policies and the Elements of their Coordination Approaches

In this section, the different CCA policy coordination approaches adopted in the studied member states are discussed.

4.1. Denmark

Denmark launched its national climate adaptation strategy in 2008 [31] to put CCA on the agenda at national and local level in 11 priority sectors [32]. While implementing a number of measures in central government, the focus of the strategy was to present a range of options for local government to prepare for a changing future climate, and to assess the risks of impacts on particular types of Danish landscapes and society. No specific obligations were attached, and the strategy presented climate change as an opportunity for the future alongside identifying a range of threats and risks to be addressed. In late 2011, a center-left coalition took office; part of their Agreement of Government was to focus on CCA, including a stronger role for municipal planning and policy. In 2012, this was followed up through an action plan [33] stressing flooding and other water related climatic changes as the major challenges for Denmark. Moreover, the government and Local Government (representing municipalities) in their annual budget negotiations agreed that each municipality had to map its territory according to flood risk and to develop a local CCA plan with a short and medium-term perspective. This requirement was cited in the Action Plan [33]. The Action Plan also specified national level actions to improve the framework for local level actions due to uncertainty in local climate impacts and the need of innovative policy approaches/measures. All municipalities have since developed a climate adaptation plan.

4.1.1. Learning Approaches

Denmark developed a broad array of learning-based approaches to aid coordination. Broader knowledge management was facilitated by Denmark having its own domestic adaptation portal, and the creation of a formal (but temporary) body for coordinating adaptation research in 2008 to aid knowledge management through disseminating adaptation knowledge and research to policy makers. The Danish Government also commissioned adaptation research in the development of the 2012 Action Plan, including a broad socio-economic appraisal, which was used to support development of the action plan. A more specific process to integrate CCA knowledge into sector decision-making process

was pursued through ex-ante policy appraisal, but mainly as an add-on to existing practice, rather than as a stand-alone part of the CCA process. Broader appraisals were also carried out initially through a CCA vulnerability assessment; risk assessments were mandated for all municipalities following the 2012 Action Plan to identify their top ten CCA priorities. Stakeholder engagement was particularly institutionalized as part of the planning process and developed specifically for adaptation by many local governments, as was the evaluation of CCA policy approaches. Facilitation of knowledge exchange has occured through a "travel team", which was originally part of the national CCA strategy, but is now largely framed by the municipalities' specific knowledge needs.

4.1.2. Planning Approaches

Denmark has clear leadership from central government leading to a number of more planning-oriented approaches to aid its coordination of CCA policy. An inter-ministerial group was active during development of its CCA strategy. However, at the time of research, much coordination occurred mainly through the CCA portal, where relevant ministries appointed people to report relevant information. As discussed above, an agreement between the national government and Local Government Denmark obliged local authorities to develop local CCA plans in a short period of time (2 years), which pushed attention, procedures, and priority, as well as actions away from the central state towards six priority areas handled by municipalities (local land use planning, Waste water management, building and construction, transport, agriculture, and nature management). However, the national government did provide assistance to municipal planners through a so-called travel team, to assist them in the development of their action plans. At the time of research, action plans had been adopted by all municipalities mostly in relation to flooding, rather than across a broader array of climate risks. More recently a change in the Planning Act has meant that municipalities are legally required to include prevention of flooding and erosion in their physical planning, incorporating also coastal protection as a new area [34]. Climate adaptation has been mentioned under environmental and nature protection in the list of national interests that municipalities are obliged to consider in their planning [34].

4.2. England

England as part of the United Kingdom has often been regarded as a leader in the area of climate policy. There has been a national adaptation strategy since the 2008 Climate Change Act. As well as introducing some novel features (e.g., the Adaptation Sub-Committee of the Climate Change Committee), the Act consolidated existing CCA activity (e.g., the Climate Impacts Program of information provision to stakeholders). As adaptation is a devolved competency in the UK political system, this analysis focuses primarily on the National Adaptation Program in England that came into effect in June 2013 for a five-year period, with a focus on eight key sectors (e.g., Built Environment, Infrastructure, Healthy and Resilient Communities, Agriculture and Forestry). It built on a Climate Change Risk Assessment [35], which identified the main risks and opportunities related to climate change. The English Adaptation Program took the highest order risks from the Climate Change Risk Assessment and sought to bring the Government into partnership with businesses, local government, and other organizations, to develop objectives, policies, and proposals to address the higher order risks. On the back of a new CCA risk assessment process, a new National Adaptation Program was published in 2017, setting out priorities in five key sectors (natural environment, infrastructure, people and the built environment, business and industry, and local government) until 2022, with the aim of increasing resilience to the main group of risks in a timely manner.

4.2.1. Learning Approaches

CCA policy coordination in England was supported by an array of element to facilitate the provision of knowledge and learning within sectoral policy making at all levels of decision making. Knowledge management was aided by expert advice from the Adaptation Sub-Committee of the

Climate Change Committee. This group consisted of experts from the scientific, business, and charity sectors to advise and scrutinize CCA policy. There was also the Climate Ready Program, which acted as a national portal to provide data to the government and the private sector; this program though was scrapped in 2016. There were also formal ex-ante policy appraisal procedures to integrate knowledge on policy impacts into policy making, supported by supplementary guidance on how to appraise potential policy for CCA impacts. Beyond the process of the individual policy appraisal, a broad economic appraisal was conducted to support the development of adaptation policy alongside a rolling climate change risk assessment (first published in 2012) and the evaluation of policy. Stakeholder knowledge was integrated into the development of the 2012 National Adaptation Program, mainly in the form of consultation exercises. The 2017 National Adaptation Program focused strongly on learning-based elements including: raising awareness of the need for CCA and augmenting the evidence-based for CCA policy making.

4.2.2. Planning Approaches

Climate policy, including adaptation, had received strong cross-party support in the 2000s, but it was somewhat side-lined by the economic recession and the austerity agenda from 2008 [36], suggesting waning leadership. This situation was reflected by the fact that resources to help sectors adapt was fairly limited, with the core team responsible for adaptation in the Environment Ministry being reduced in size—on the back of austerity measures. Moreover, austerity reduced funding available to flood defense projects, and related adaptation planning, thus challenging climate adaptation in localized settings. That being said, the 2008 Climate Change Act mandated adaptation planning and reporting, creating a degree of stability against the ups and downs of government priorities. Sectoral adaptation plans—led by respective ministries—were an important part of the planning policy coordination process. However, in practice, according to an interviewee, the plans were more of a 'summary of what is already taking place' rather than concrete implementation roadmaps.

4.3. Finland

Finland was an early adopter of adaptation policy. Its first National Climate Strategy was adopted in 2001 as a government report to the Parliament. In its response, the Parliament noted the need to prepare a program for CCA. The national adaptation strategy was published in January 2005 and prioritized 15 policy sectors for action. While the adaptation strategy was a separate, nearly 300-page document, key aspects of it were included in a section of the 2005 National Energy and Climate Strategy. Detailed measures and implementation of the CCA strategy were provided to the sectors. Implementation in most of the natural resource and built environment related sectors were detailed in action plans prepared by the Ministry of Environment (2008 and 2010), Ministry of Agriculture and Forestry (2011), as well as the Ministry of Transport and Communications (2009, 2013). In November 2014, a new adaptation plan was adopted—the National Climate Change Adaptation Plan 2022—in response to policy developments at national and EU-level, as well as improved knowledge on impacts and vulnerabilities. This plan provided strategic guidance for all sectors of government by providing a framework for the implementation of CCA policy in Finland, alongside stressing sector responsibilities. Action was further consolidated with the approval of the 2015 Climate Change Act.

4.3.1. Learning Approaches

To broadly facilitate CCA knowledge management, governmental research institutes provided expert advice on adaptation, while an independent climate change panel of experts operated in parallel, with the mandate to advise government on climate action, including adaptation. Finland also had its own national adaptation portal for use by interested stakeholders at all levels of decision making. Amongst our sample of EU Member States, Finland is the only country in which policy appraisal was highlighted as a keystone tool for integrating adaptation planning into sectoral policy making, rather than an add-on process to existing policy appraisal procedures. In parallel, the Finnish CCA plan

(2014), encouraged the use of risk assessment alongside vulnerability assessment. Prior to this, such assessments were only partial and focused on just vulnerability. To support this activity, the Finnish Government funded dedicated small-scale projects, in 2016 and 2018, to outline how data should be collected and knowledge generated to improve risk and vulnerability assessments. For example, the project ELASTINEN concentrated on examining the state of weather and climate risk management and the role of different actors in Finland, clearly stressing elements of learning [37]. In addition, the Strategic Research Council of Finland (https://www.aka.fi/en/strategic-research-funding/) has funded large (>2 M€) projects focusing on adaptive approaches to climate change. The funding conditions of the Strategic Research Council stress co-creation with stakeholders, including ministries. Self-reported evaluations by the sectors in 2009 were used to provide lessons on the performance of the 2005 national adaptation policy and formed the basis for the development of the 2014 adaptation plan, and stakeholder engagement is generally used around the formulation of its adaptation policy. A mid-term review of the 2014 plan was carried out in 2018−2019, highlighting the lessons learned and providing guidance for future action [38].

4.3.2. Planning Approaches

There has been generally strong support for CCA in the public administration, although it had not been as high on the political agenda as climate change mitigation. The 2015 Finnish Climate Act set the national adaptation plan and reporting on progress as a legal obligation. Moreover, inter-ministerial working groups were comprised of a broad group from both central government and the municipalities. The more advanced sectors (such as natural and built environment, natural resource-based sectors, transport) produced implementation plans, and the 2014 national adaptation plan reiterated the obligation of sectors to ensure adaptation in their own field. In terms of resourcing, there was only one person in the Ministry of Agriculture and Forestry (the policy lead devoted to work on the overall adaptation strategy process) working on CCA, but there were staff with responsibility for CCA in other ministries. Dedicated funding directly supporting the adaptation planning has been limited to relatively small (<300 k€) projects funded under the Government's analysis, assessment, and research activities. One of these projects provided a policy brief on a governance model for climate and weather risks that would require systematic planning [39].

4.4. Germany

In 2008, the Federal Government of Germany adopted the "German Strategy for Adaptation to Climate Change" (Deutsche Anpassungsstrategie, DAS). This strategy laid the foundation for a medium-term process to identify the effects of climate change, assess the risks, and develop and implement measures across 13 sectors. To underpin this strategy, an Adaptation Action Plan was adopted in 2011, setting out steps for the further development and implementation of the Strategy. It followed an integrated approach for sectoral and regional activities and sought to anchor consideration of the possible impacts of climate change into all relevant policies. In 2015, following an evaluation of the Climate Change Adaptation Plan, a second action plan was produced. Despite this activity, our data suggest that implementation of these plans has been at best partial, with the majority of activity still stemming from the 2008 strategy.

4.4.1. Learning Elements

On a broad level, learning approaches to CCA policy coordination in Germany were aided by the Climate Service Centre Germany, which provided policy makers and stakeholders with expert advice. CCA was also considered as an add-on to its standardized policy appraisal processes, meaning that CCA was integrated into their decision-making processes. In addition, broader appraisal to specifically support adaptation planning occurred in the form of a national vulnerability assessment undertaken in 2015. To help sectoral policy makers engage with CCA, there were awareness raising and networking workshops (funded by different ministries, but mainly Federal Environmental Agency,

06844 Dessau-Roßlau, Germany) which sought to improve policy maker's knowledge and skills, as well as knowledge of additional stakeholders such as companies and citizens. Moreover, in 2018 the German climate preparedness portal was launched to provide information and tools to aid municipalities, businesses, and society in their CCA planning. The inclusion of stakeholders into the policy process occurred for the development of national CCA policies. For example, the Federal Environmental Ministry and the Federal Environmental Agency established stakeholder dialogues to inform relevant stakeholders and several sectoral workshops, and national conferences were organized from 2005. More recently, stakeholder dialogue has become broader and a more regular part of adaptation planning incorporating citizens, industry, and regional and local clubs, among others. In addition, there are regular evaluations in the form of, for example, 5-year review cycles for the adaptation strategy and the action plan.

4.4.2. Planning Elements

Germany was generally light on the planning side of its CCA policy coordination. For a long time, the primary focus of German climate policy was mitigation, with adaptation seen as a sign of resignation and acceptance of climate change [40]. As Germany has been a front-runner in climate mitigation, resistance to accepting climate change and, hence, to engaging with CCA was particularly strong. Planning for CCA was mainly organized around an inter-ministerial working group, which was also comprised of representatives from the federal units, the Länder, which is now established as a permanent body. As well as this vertical working group, horizontal ministerial working groups have also existed at the federal and Lander administrative levels.

4.5. Netherlands

At the time of research, there were contrasting views on whether the Netherlands had developed a compressive strategic cross cutting approach to CCA or not. Swart et al. [40], Biesbroek et al. [1], Mees et al. [41], and Termeer et al. [7] referred to the policy plan 'Maak Ruimte voor Klimaat¡ from the Ministry of Housing, Spatial Planning and the Environment (2007) as a cross cutting national strategy for adaptation. However, the Dutch National Audit Office (Algemene Rekenkamer) [42] observed that this policy plan was never translated into concrete measures with a timeline and/or assigned to bodies responsible for implementation, leading to insufficient policy attention for vulnerabilities in the public health sector, the energy sector, the transport sector, and the recreation sector. In addition, there was the Delta Program—a large national policy program focusing mainly on water management and addressing issues like flood risk management, fresh water supply, and climate proof urban development [42]. To align with the EU's CCA Strategy in 2013, the Dutch Ministry of Infrastructure and Environment developed a new adaptation strategy in 2016 to integrate climate adaptation into the activities of governments, civil-society organizations, citizensand businesses in six priority areas (heat stress, infrastructure, agriculture, nature built environment, and the regions). This adaptation policy will be monitored and evaluated on progress and effectiveness.

4.5.1. Learning Elements

In terms of broader knowledge management, the Dutch Environment Assessment Agency acted as a boundary organization for a number of environment-related issues including CCA. More specially though, given the weakness of the broad cross sectoral CCA approach in the Netherlands, the majority of specific processes for CCA policy coordination were associated with the Delta Program. For instance, in 2014 the Delta Program proposed to adapt the Water Test (a water impact assessment that initiators of spatial planning should undertake and discuss with the water management authority in place) so that it better considered long-term impacts and to encourage its application at an early stage in the decision making process. Societal Cost–Benefit Analysis was also used in Delta Program. The Delta Program also promoted the use of the EU's Climate-ADAPT portal to help decision makers understand potential climate impacts surrounding their sector and region. The Delta Program emphasized deliberation

among governmental bodies involved (provinces, water boards, municipalities), other relevant public bodies, and relevant societal actors from the profit sector and non-profit sectors. The early phases of the 2016 Adaptation Strategy have focused on creating dialogue between sectors and stakeholders to identify which parties are responsible for responding to serious climate risks. The 2016 Adaptation Strategy will also be monitored and evaluated on progress and effectiveness. How implementation will be monitored and evaluated exactly is still—at the time of the research—under consideration.

4.5.2. Planning Elements

Planning approaches to CCA policy coordination in the Dutch case were made problematic by the fact of there being two competing strategies, with the water sector focused Delta project enjoying the lion's share of commitment, meaning the CCA action focused mainly on the water sector at the expense of a broader cross-sector approach. Crucially, the Delta project had funding to provide finance to flood and water supply projects. Moreover, the Delta project had an administrative center to facilitate more coordinated policy action, which was not the case for the broader adaptation strategy. By contrast, the CCA failed to gain traction until 2012, when the aforementioned new strategy was developed. In the light of these problems, the 2016 National Adaptation Strategy had a specific prioritization for policy action on heat stress, infrastructure, agriculture, nature conservation, built environment, and regional strategies. Implementation of this new National Adaptation Strategy started in 2018.

4.6. Italy

Italy was a relative latecomer to nationally coordinated CCA policies. In response to the EU's adaptation policy, Italy's CCA policy was adopted in June 2015. The policy listed a number of specific objectives to be achieved by 31 December 2016, e.g., the definition of institutional roles and responsibilities for the implementation of the Strategy, such as a Permanent Forum for enhancing the CCA awareness among citizens and stakeholders and a National Observatory (including Regions and local authorities) for identifying territorial and sectorial priorities and for monitoring of adaptation actions; the need for a more detailed estimate of adaptation costs in the different sectors; and the definition of a Monitoring, Reporting, Evaluation (MRE) system for the future implemented actions. In 2016, the Italian Ministry for the Environment, Land and Sea (IMELS) started working on a draft National Adaptation Plan to: (1) provide institutional guidance to national and local authorities; (2) prioritize adaptation actions and identify roles and responsibility; and (3) define a framework and provide guidelines and indicators for monitoring and evaluation. Furthermore, in 2016 the National System for Environmental Protection set up a National Working Group on impacts, vulnerability, and adaptation to climate change aimed at defining a set of climate change impact indicators [43]. The finalization of the Italy's approach to CCA was planned for the first half of 2018 [44], but it failed to reach this target or to establish the CCA Permanent Forum and CCA National Observatory.

4.6.1. Learning Elements

Italy's approach to the development of CCA policy was supported by expert teams from several National scientific/technical institutions. Italy was the only country sampled that performed a comprehensive appraisal of its implementation of the EU Directives and regulations (Acquis communautaire) in the context of CCA policy. This contained elements or links to climate change impacts and vulnerability, adaptation, and disaster risk reduction [45]. This approach in part related to the fact that, as a relative latecomer, the Italian approach was greatly shaped by the EU's intervention in the area of adaptation. For similar reasons, Italy did not develop its own adaptation portal and instead referred to the EU one. The development of Italy's CCA policy was aided by e-consultation of national, regional, and local stakeholders in relevant sectors. Furthermore, both an online public review and ad hoc public consultations were organized to promote the involvement of citizens and stakeholders such as NGOs, municipalities, the private sector, and trade unions.

4.6.2. Planning Elements

Italian CCA policy was to be implemented through a National Adaptation Plan, which at the time of the research had not been approved [44] due to the need to finalize its environmental impact assessment. Additionally, a new forum including all regional authorities was established under the umbrella of the Unified State-Regions Committee, to coordinate CCA policy actions at the regional and sub-regional levels [44]. In terms of resourcing to aid adaptation planning, some municipal actors had training. Wider funding, though, tended to be targeted at programs from the EU rather than domestic budgets.

4.7. Summary

Overall, we see that despite the variation in our sample, the broad overall trend is that the CCA policy coordination processes in the studied countries following the publication of the EU Adaptation Strategy tended to be more strongly (although not exclusively) oriented towards learning approaches to coordination, especially in the Dutch, German, and Italian (see Table 2). Planning approaches tending to be more piecemeal or less comprehensive with limited steering towards concrete adaption measures in the sectors beyond reporting and action plan development.

Table 2. Summary of climate change adaptation policy coordination elements used.

	Denmark	United Kingdom (England)	Finland	Germany	Italy	The Netherlands
Learning approaches						
(1) Policy appraisal	x	x	x	x	x	x
(2) Stakeholder engagement	x	x	x	x	x	x
(3) Boundary organizations and independent advisory panels	x	x	x	x	x	x
(4) National Adaptation portals	x	x	x	x		
(5) Evaluation	x	x	x	x		x
Planning approaches						
(6) Leadership	x		x			
(7) Inter-ministerial/sectoral committees	x	x	x	x	x	x
(8) Integration units						
(9) Cross-sectoral strategies	x	x	x	x	x	x
(10) Action plans	x	x	x	x		x

5. To What Extent Are the Approaches Facilitating Positive or Negative Coordination Approaches to CCA Policy?

Having outlined the coordination approach of the studied countries, this section draws on the comparison between the approaches employed, and explores the extent to which this impacts upon the pursuit of (positive or negative) coordination to promote coherent approaches to CCA. We also discuss the importance of achieving positive coordination, and whether it actually matters.

At a general level, we do find some differences in approach in the studied member states that could be linked to political context. Notably, while many of the sampled approaches prioritized action at the local level as would be expected with the context-specific challenge of CCA, they did little to back this up with concrete measures or formal accountability. The Danish approach, by contrast, stood out as it more concretely assigned responsibility for cross-sector planning on adaptation as a task for municipalities, thus mixing top-down (vertical) coordination with horizontal coordination. This trend perhaps aligns with Denmark's rather high degree of decentralization, as the local level plays a strong role in the implementation of policies in general. Likewise, Germany's approach seemed to have

many centers creating pathways for horizontal (between sectors) and vertical (between governance tiers) coordination. This situation is reflective of its federal political system in which competencies for areas in which adaptation is important were shared between the Federal government and the Länder. This balance between Federal and Länder interests perhaps then explains why Germany in general had fewer planning elements in its approach when compared to the majority of the other sampled countries. We also see some differences that could arguably related to a member state's established relationship with environmental policy. England, Finland, and Denmark in particular, tend to fulfil their roles as environmental policy leaders (see [45] for a critique) and thus have well-established adaptation policies which have been amended over the years. Note though that there is a growing body of evidence that local level implementation of the CCA measures in the England have fallen short of what one would expect of a leader [46,47]. Climate adaptation policy coordination in these 'leading' member states, in particular, pre-empted EU CCA intervention by many years. Our analysis suggests that the three early adaptors unsurprisingly seemed to have the greater array and balance of planning and learning elements at their disposal. By contrast, Italy conformed to the wider perception that it is a relative environmental policy laggard in the EU, as it is a relative late comer in terms of developing a more strategic coordinated approach to CCA policy. It is possible that the Dutch approach was particularly shaped by its particular climate vulnerabilities as shown by its very weak implementation of its cross-sectoral approach to adaptation, yet strong action in the water sector. This situation is likely to reflect a combination of the strong institutional base of the Dutch water sector and the particular vulnerabilities to sea-level change and coastal and alluvial flooding [37]. This example highlights a wider point around the geographic heterogeneity of the study countries, with smaller countries such as the Netherlands and Denmark facing a smaller set of climate challenges over all their territory, while geographically more varied countries such as Italy have climate impact on everything from glaciers to coastal wetlands to contend with, which may require different responses and actor groups.

As noted in section two, the pursuit of coordination not only depends on the coordination elements in place, but on how the different elements interact with existing hierarchies and decision rules, especially considering CCA being a relatively new, but long-term, issue. So, while the mix of coordination instruments is important, so is the level of legal, political, and organizational authority present to shape the actions of institutional actors who have other interests and priorities than CCA (see Section 2). The fact that all of the countries included in this study have cross-sectoral adaptation policies suggests that different ministries, tiers of government, and associated sectors have acknowledged some responsibility for adaptation to climate change. This would suggest a strategic cross-government approach to CCA coordination more akin to positive coordination (see Section 2). However, the existence of a comprehensive and strategic cross sectoral CCA policy process in itself cannot be taken as evidence of positive policy coordination. The logic of positive coordination suggests the processes need to shape the actions of actors through either legal authority, high-level political support, and/or organizational and financial resourcing (see above; [15]).

In terms of legal authority, CCA policies in all but three (Denmark, Finland, and UK) of the studied countries consisted of soft measures with no legal or otherwise binding mandate. Indeed, our scrutiny of the different elements in the learning and planning approaches were indicative of rather modest levels of ambition, with few legal mandates supporting the CCA process. Even in the cases where some mandated activity is required (England, Finland, and Denmark), the emphasis has been on obligatory processes rather than the concrete implementation of policies to achieve CCA goals. For instance, in England and Finland, where Climate Change Acts have provided legal provision for CCA, mandated actions are primarily framed around reporting and developing sectoral plans. Implementation is expected to occur through the normal management system of each sector. In Finland, CCA negotiations on the contents of sectoral plans were ensured by the Climate Act, but issues of resourcing were still mostly decided by the sectors. Denmark mandated CCA planning in the municipalities, but planning does not in itself mean that necessary implementation of measures will take place. Thus, in sum, even

where a mandate existed, it is hard to make a case for the presence of deep positive coordination for CCA policy on this measure alone.

In the light of the absence of binding obligations, was authority provided through high-level political leadership? Without strong and continued support from powerful government actors (e.g., the Prime Minister, Finance Ministers, etc.), CCA policy coordination can struggle to engage other ministries in a more strategic manner associated with more positive forms of coordination. Our data suggest that high-level national leadership for CCA within the administrations waxed and waned over time. While high-level support appeared to be strong in Finland, our data suggest that this did not initially have marked impact on the administration more broadly. Moreover, our analysis suggests that from 2011 adaptation was less of a political priority in Finland, but since the publication of the IPCC 1.5 °C report in 2018 adaptation to climate change has been also politically emphasized. In the Netherlands there was a clear gap in leadership, with the broader cross-sectoral strategy playing second string to the better supported Delta Program, with its far narrower focus on water in agricultural and urban contexts. The development of CCA policy coordination appeared more driven by European intervention in this area than national politics in the Italian case. Germany was a reluctant entrant in the CCA field, because of its focus on mitigation. That said, there were active political moves at both the German Federal and Länder level to promote both vertical and horizontal coordination. In England, although CCA policy had strong cross-party support in the 2000s, this support was side-lined by the economic recession and austerity agenda [36]. In contrast to this general pattern, our data suggests that leadership in Denmark appeared stronger, with a clear push by central government to encourage municipalities to produce adaptation action plans, with scientific and some financial support.

The extent to which policy coordination can be facilitated is also reflected in the resources allocated to the issue, e.g., see [14,15,22] above. We observed that the studied CCA policy coordination approaches received very different levels of resources. The issue of resourcing is particularly important, as coordination can be resource intensive (in terms of financial and organization resources), providing little incentive for actors to engage beyond negative coordination to avoid costly conflict with cognate ministries [15]. Thus, separate resource provision for CCA can be an important incentive for encouraging actors to engage with more positive forms of CCA coordination. Such funding is generally targeted in at least three ways: support for sector actors; dedicated CCA research funding; and dedicated organizational resources (e.g., people, time, etc.).

In terms of supporting the sectors, provision in the member states studied to aid sectoral adaptation was mixed. While the majority of the studied countries did not seem to significantly support sectoral actors, there were some exceptions. Denmark, for instance, had a number of private and public funding sources directed at innovative and cross cutting adaptation projects, and in the Netherlands the Delta fund provided financing to flood and water supply projects. In Italy a well-funded public scheme named "Italia Sicura" was established in 2014 under the Prime Minister's Office and working in a close collaboration with the Minister for Environment, Land and Sea (IMELS) and the Minister for Infrastructures and Transport to initiate and monitor the progress in implementing the national plan to prevent and combat hydrological risk and the Metropolitan Flood Protection Plan. In July 2018, this mission of Italia Sicura was moved to IMELS. By contrast, England reduced the funding available to flood defense projects as a result of spending cuts. Other countries (e.g., Finland and Germany) focused resources for CCA on increasing the knowledge base for decision makers. In Finland, there has been limited dedicated funding for adaptation research and development projects from 2010 for direct planning-oriented approaches, but more resources have been made available for learning. Even the funding from the Government's analysis, assessment, and research activities, which was created as a funding instrument for supporting ministerial planning, has stressed learning rather than top-down planning [37]. However, the use of regional development funds for concrete activities have increasingly been justified with reference to adaptation to climate change [38]. In Italy, funding was targeted at programs from the EU rather than domestically funded initiatives.

Organizational resources to help sectors adapt also appeared fairly limited across our studied countries. England saw the core team responsible for adaptation in the Environment Ministry reduced in size. There was only one person in the Finnish Ministry of Agriculture and Forestry working full time on the overall adaptation strategy process, but again there were staff with responsibility for adaptation in other ministries. Some municipal actors in Italy had training through specific EU-funded LIFE projects. In Germany, there were awareness raising and networking workshops (funded by different ministries, but mainly the Federal Environmental Agency), which sought to improve policy makers' knowledge and skills. The Danish national government provided assistance to municipal planners through the travel team of experts as well as through developing concepts for risk mapping. Overall, it can be concluded that there was a mixed pattern of resourcing in the studied countries. The evaluation of the E U Adaptation Strategy has also recognized that the financing of climate action is an issue that needs to be tackled and foresees a diversification of instruments under sustainable finance to support adaptation [17,18]. Such development, especially an increasing share of private investments, is likely to increase a demand for positive coordination.

6. Conclusions

This paper sought to address the questions: (1) What are the main elements making up the administrative approaches for CCA policy coordination processes in the studied European Member States? (2) To what extent are these approaches actually operating to deliver more coordinated CCA policy approaches, and what lessons can be learnt from this? To address question 1, our findings suggest that while all the studied Member States follow a similar approach with a stronger focus on learning elements (e.g., policy appraisal, stakeholder processes, etc.), the orientations, array in place, and the level of political commitment to CCA vary. We see some noticeable variation among the studied countries, which can in part be explained by political contexts (e.g., the political culture and structure, in relation to domestic relationships and EU policy relationships) and geography. However, the greatest diversity in approaches appear unsurprisingly to be applied by those countries (Denmark, Finland, and England) with the longest history of adaptation policy making. In terms of question 2, our analysis of CCA policy coordination approaches suggests that institutional hierarchies and decision rules leaned towards the pursuit of negative forms of coordination; i.e., they appeared to be geared towards avoiding conflict through knowledge provision and the softer use of planning approaches.

What lessons we can draw from the analysis? Crucially, the impacts of climate change on adaptation activities have so far been relatively modest in Europe. This indicates that the acute need for action has still been moderate at most—with the exception for some regions/locations. That being said, the observed pattern could also be seen as a problem-solving combination of positive and negative coordination [48]. For example, from a positive coordination perspective, general CCA needs are strategically acknowledged and there is a willingness to agree on the approaches and principles, but when it comes to detailed implementation, the coordination approaches seem more on the negative side. While this is not in itself a problem—as noted in Section 2—positive coordination is not normatively positive in that transaction costs may be high. In the longer term, as climate impacts become more pronounced and disruptive and as climate adaptation may become more entrenched through learning processes, more positive coordination approaches may manifest. Increasing awareness of potential climate change impacts across administrative sectors may also tip the balance in favor of more positive coordination, without requiring a strong hierarchical steer or at least the threat of one as suggested by Scharpf [15]. Recent developments in several of the studied countries indicate an increasing willingness to coordinate not only principles, but also concrete actions. For example, adaptation combining land use planning, flood risk management, and the use of nature-based solutions is increasingly attracting interest and requires positive coordination to achieve its objectives of greater resilience to climate change.

Future research could examine how coordination elements and related approaches interact with existing decision rules and hierarchies operate within distinct sectoral policy-making episodes to

provide a street-level view of CCA policy coordination. The seriousness of the already realized impacts of climate change may provide fruitful causal factors in developing an understanding of the conditions for positive coordination. Further insights into CCA coordination may also be gained through different conceptualizations of coordination such as networked governance [15,49]. These approaches may portray a more nuanced and thus sometimes messy picture of coordination. Ultimately, evaluating the different ways in which CCA coordination materializes, as this paper has started to do, is crucial to the understanding of how policy makers working in different sectors and governance tiers can plan in the long-term to adapt to climate change impacts and other important cross-sectoral challenges.

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