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Climate Change Adaption between Governance and Government—Collaborative Arrangements in the City of Munich

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Abstract: Growing cities face severe land use conflicts. Urban expansion and the densification of existing built areas are increasing the pressure on green spaces, which are key for climate change adaptation. Planning procedures embroiled in these land use conflicts are often complicated and slow. This is due to the increasing complexity in planning processes, which involve a multitude of stakeholders and decision-makers, whose responsibilities are not always entirely clear. Governance-oriented forms of decision making with horizontal structures are often required, but these also entail challenges. In our study, we ask how climate adaptation through urban green spaces can be integrated into planning processes. The study is based on a methodological combination, including document analysis and qualitative interviews with administrative staff. The City of Munich, a rapidly growing German city, serves as a case study. The results show different collaborative arrangements in four planning arenas and demonstrate how these structures support or hinder climate change adaptation mainstreaming. We conclude that hierarchical structures impede horizontal collaborative arrangements and shed lights on mechanisms reinforcing these structures. For large administrations, informal meetings and coordinating units are effective in fostering interdepartmental cooperation.

Keywords: collaborative arrangements; governance; urban planning; climate change adaptation; urban greenery; planning arenas

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1. Introduction: Climate Adaptation Entangled in Tensions between Different Modes of Governance

Due the increasing impacts of heat waves, droughts, and extreme rainfall [1], cities need to adapt to climate change to remain liveable. In particular, cities are at risk due to their increased levels of soil sealing, density of the urban fabric, and limited green spaces [2,3]. Urban green infrastructure (UGI) is promoted as a strategy for a more climate resilient city [4–7]. UGI is to be understood as a multifunctional network of green urban spaces that spread through the entire city, transcending property and administrative borders [8,9]. However, especially growing cities face various challenges to develop UGI, which mainly manifest themselves in land use conflicts. A major challenge is the competing interests for urban green spaces for either residential development or UGI measures for climate change adaptation (CCA) [2,10].

To tackle these challenges, there is an increasing call for "governance approaches that promote continuous cross-sectorial collaboration on and between different levels of decision making; from the urban regional level to the site level, and from short-term interventions to long-term strategic planning" [11] (p. 29).

The increased need for collaboration is in line with the increased call for governance in recent decades [12–16], which came about due to profound changes in society and politics such as increased "diversity, uncertainty, heterogeneity of society, and the decreased

possibilities for inducing long-term change by government" [17] (p. 166). Governance is characterised by the fact that policy-making is no longer shaped solely by governmental actors, but increasingly also jointly by and with various stakeholders [18,19]. According to this, governance means "the totality of interactions, in which public as well as private actors participate, aimed at solving societal problems or creating societal opportunities" [20] (p. 4). In this sense, governmental actors have been steadily losing control over recent decades and are frequently seen as a negotiating partners cooperating with different societal actors [21] (p. 17), where the state can have various roles: from centralised governance with pronounced top-down control to governance, in which the government takes on more of a supporting role [22–24].

These changes mean that governmental actors must deal with a correspondingly large number of actors, such as the private sector, civil society, and researchers [25]. Bottom-up grass roots initiatives can support implementation of UGI [26], yet their aims might diverge from government-led approaches [27]. Strengthening the collaboration between governmental and non-governmental actors can lead to mutual benefits and enhanced development of UGI. In addition to the various external participants involved in planning and decision making, the variety of actors within the city administration also have to be considered for governance of CCA. CCA with UGI can involve several departments in charge of e.g., green and urban planning, environmental protection and nature conservation, urban drainage, and health departments. Even though the expertise to tackle multifunctional and multiscale UGI projects might be present, cross-sectorial collaboration by governmental institutions is often difficult where sectors operate in "silos" [28].

For many cities, aiming to mainstream and apply UGI and CCA strategies in urban planning and policies [3], a transition to more network-like collaborations might be required, although the complexity of the city administration itself might require a hierarchical structure. Many of these tasks related to CCA and UGI within and outside administrative departments, such as "nature conservation [...] and spatial planning are structurally characterised by modes of governance that combine hierarchical coordination with network-like forms of cooperation" [12] (p. 423). Hierarchical arrangements allow for clear responsibilities and more straightforward planning processes. However they might lack democratic legitimacy of involved non-state actors, which complicates their ability to deal with complex planning issues further [21] (pp. 22–25). Due to the diversity of involved actors, in network-like collaborative arrangements, democratic legitimacy is often better. Moreover, this leads to improved communication, increased acceptance, and common understanding [29]. Network-like collaborative arrangements are considered essential to catalysing change processes [30]. Broad collaboration can contribute "to carry out a public purpose that could not otherwise be accomplished" [31] (p. 2).

Thus, collaborative arrangements play a pivotal role in urban planning [19,32], yet research on how network-like arrangements can be established in administrative bodies to solve land use conflicts related to CCA is sparse. Particularly the interrelations of network-like arrangements within existing strong hierarchical collaborative arrangements in city administration systems call for a more in-depth investigation, as municipalities play a key role and are important stakeholders for enforcing climate mitigation and adaptation, and for aligning it with other local agendas [33,34].

In this study, we aim to analyse the state of collaborative arrangements on different levels in a large municipality, and we explore the barriers and enablers for collaborative arrangements support or hinder CCA mainstreaming as well as how collaborative arrangement themselves support or hinder CCA mainstreaming. In the following section, we present our conceptual framework for supporting the analysis of collaborative arrangements between different planning arenas. Based on this conceptual framework, we analyse collaborative arrangements for CCA illustrated by the case of Munich. The identified barriers and enablers will then be discussed, after which we will conclude with recommendations for practice and research.

2. Conceptual Framework: Collaborative Arrangements

The move from government to governance and the aim for CCA and UGI mainstreaming often means that municipalities adopt a more network-like structure to accommodate more types of governance modes. These transitions in institutions occur, according to Coaffee and Healey [35], on three different levels of governance interaction, namely on (1) the level of actors and their arenas, which are largely determined by personal perceptions and "interpersonal relations"; (2) the level of governance processes, which constitute the networks, coalitions, and discourses within "institutional practices", and (3) the level of "governance cultures", which includes "taken-for granted assumptions, habits and routines". The second level aligns with the focus of our study on collaborative arrangements within larger complex governance systems.

Understanding collaborative arrangements starts with defining the actors involved in the collaboration. The idea of arenas, however, helps us to move away from a focus on individual actors and to identify distinct "institutional sites" within the larger governance context [35]. For our study, we define a planning arena as a distinct group of actors with common motivations and values, who together work on achieving planning objectives related to CCA. Diversity among planning arenas might encourage different perspectives, while large differences might lead to conflict due to a lack of understanding. We might be able to understand better why barriers or enablers occur by establishing commonalities and differences between the various planning arenas in their roles, internal structures, or conditions. Conditions also determine the capacity for collaborative action of planning arenas [31]. Motivation is often linked to the previous positive or negative experiences of actors in collaborative arrangements [31], while within the planning arena the shared discourse can define collaborations as necessary [35]. Knowledge, expertise, and resources further define factors for the planning arenas' capacity for collaboration (see Table 1). Knowledge and expertise refers to knowledge as the "currency for collaboration" [31], i.e., the reason for collaboration, while expertise relates to the skills needed to participate in collaborative arrangements. We define resources for collaborative arrangements in terms of finances, time, and technical support [31].

Planning arenas can be found on three different planning levels, national, regional, and local [36]. They do not exist independently of one another, but are closely interconnected [31]. Within the traditional governance approaches, planning arenas were often considered hierarchically embedded within one another [33,37]. The idea of embedded planning arenas allows us to tackle the complex hierarchical structures of municipalities. In the new network approaches to governance, planning arenas are interconnected through an intricate web of vertical, horizontal, and diagonal connections [35,38]. In this study, we are interested in understanding both hierarchical and network-like structures in and between planning arenas, and how these influences CCA mainstreaming. For this reason, we need to define the direction of the collaborative arrangement [35,38]. However, such collaborative arrangements can appear within as well as between planning arenas. Therefore, internal and external directions also need to be considered.

To further understand collaborative arrangements, we turn to the integrative framework for collaborative governance by Emerson et al. [31]. It provides an comprehensive framework to analyse collaborative arrangements from various policy domains, with diverse stakeholders at different scales [31]. With the framework, complete governance systems as well as sections of governance systems can be analysed [31]. To gain insight into collaborative arrangements, we focus on the section of collaborative dynamics, which is defined by principled engagement, shared motivation, and capacity for joint action [31]. In addition, we look to theory on governance modes, as it considers the collaborative arrangements between governmental and non-governmental stakeholders [39]. These arrangements are not limited to formal, state-initiated agreements, but can also include informal collaborations initiated by non-governmental actors [23]. The frameworks typically used for defining these archetypical forms of collaborations, allows us to assess and understand different collaborative arrangements.

Collaborative arrangements can be defined by their functionality and responsibilities [31], which often provide the legitimacy for collaboration. This legitimacy also needs to be recognised among the participating actors and planning arenas [31]. Participants need to perceive an added value to the collaborative arrangement. Mutual benefits strengthen the interdependence of the different participants, but can be further strengthened by mutual understanding, shared commitment, and trust [31]. Mutuality between participants is likely to determine the level and frequency of interaction in collaborative arrangements [31], where one expects more interaction between interdependent participants. However, these interactions are further defined by the conditions of the individual planning arenas as well as how the collaborative arrangement is structured and where the locus of authority lies [39].

Table 1. Conceptual framework for the analysis of planning arenas.

Arenas (Institutional Sites) [35]		
Dimension	**Attributes**	**Sources**
arenas	type of actor	[35,39]
	structure, responsibilities, and function of arena	[35]
conditions	motivation	[31]
	discourses	[35]
	knowledge and expertise	[31]
	resources	[31]

We expanded the integrative framework for collaborative governance by Emerson et al. [31] by aspects in relation to governance modes [23,35,39]. Characterising the collaborative arrangements by the attributes shown in Table 2 provides insights regarding enhancing or inhibiting factors.

Table 2. Conceptual framework for the analysis of collaborative arrangements.

Collaborative Arrangement [31]		
Attributes	**Definitions**	**Sources**
direction of arrangement	the direction can be hierarchical (vertical), or horizontal, as well as internal and external	[38]
actor role and structure of arrangement	positions and roles (e.g., leading, following) taken by actors and differences between them (e.g., equal) in the collaborative arrangements	[23,31,35,39]
function of arrangement	main functions of the collaborative arrangements	[31]
locus of authority	the position and structure of decision making	[39]
level of interaction	the level and frequency of interaction within and across the different planning arenas.	[31]
mutuality	the interdependence of different planning arenas on each other in the collaborative arrangements through shared commitment, internal legitimacy, mutual understanding, and trust.	[31]

3. Materials and Methods

To gain a deeper understanding about the barriers and strategies of internal and external collaborative arrangements for CCA mainstreaming, we applied a case study approach [40] to the city administration of Munich. The City of Munich has a hierarchical structured administration and was a partner in the research project "Green City of the Future" (2018–2021) funded by the German Federal Ministry of Education and Research. The project's aim was to enhance integration of urban greenery in selected urban planning processes of densifying cities to improve their climate resilience, and to test how these processes can be implemented in urban planning. To do so, the research project fostered collaborations between researchers from different research institutions[1] and personnel from the City Department of Urban Planning and Buildings Regulations and the City Department of Climate and Environmental Protection. The research collaboration between municipal and scientific staff included workshops, field visits, interviews, modelling the micro-climatic impacts of UGI measures, socio-economic analyses, regular dialogues and meetings, feedback loops and exchanges about relevant policy and planning documents. For this study, we build mainly on the expert interviews and document analysis, which will be detailed further in the following sections after introducing Munich as case study.

3.1. Munich as Case Study

Munich, the Bavarian capital located in the south of Germany, represents an interesting case to analyse integration of climate resilience into urban planning, as it is one of the biggest and densest cities in Germany [41]. Its population of 1.58 million inhabitants is expected to rise to 1.85 million by the year 2040 [42,43]. Moreover, the city already experiences the consequences of climate change with a clearly detectable urban heat island effect [44]. Since 1955, the average air temperature increased by about 0.31 per decade with a rising number of hot days (maximum air temperature of more than 30 °C) [44]. The City of Munich has made various efforts in view of climate change. In 2014, an urban climate analysis was carried out, and two years later the City of Munich adopted a climate change adaptation concept [45]. The concept includes regular monitoring of implementation measures. The last monitoring report dates from 2021 and provides input for an update of the climate adaptation concept [46]. In addition, the city has adopted open space design statutes, that prescribe standards for green space even outside of development plans [47], and uses an instrument called socially equitable land use [sozialgerechte Bodennutzung] to strengthen affordable housing and to force investors to share the costs of social infrastructure [48,49]. These efforts are attempts to address high land use conflicts, as available building land is scarce and expensive due to high housing demand and the city's economic importance. High targets for housing per year, which have risen continuously in Munich and other major German cities in recent years, have increased competition for land use and put further pressure on the administration. However, in Munich, only a few conversion areas are still available that can be used for building development [49]. The tensions between urban development and the need for preservation and development of UGI for CCA are, therefore, pronounced.

Munich's Actors in the Context of CCA

The City of Munich has a large and diverse administration that is linked to the political structure. Figure 1 shows the higher-level management structure of Munich. The heads are the mayors and the city council with the highest decision-making power and planning sovereignty. This decision-making power includes altering the responsibilities of the departments or creating new ones, approving resolutions, or setting political targets that must be adhered to by the administration, for example to establish a CCA conception.

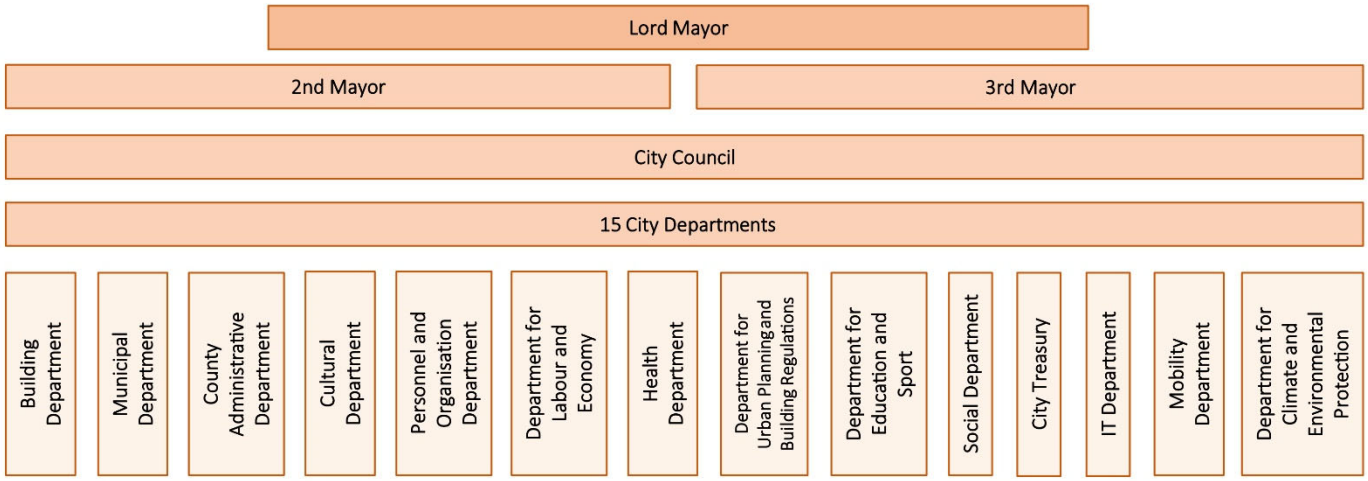

Figure 1. Higher-level management structure (Geschäftsverteilungsplan) of Munich, adapted from [50].

The administration is the next hierarchical level, with 15 city departments, each under the direction of permanent councillors. The permanent councillors implement the political guidelines in the individual city departments, e.g., by developing action programmes or integrated concepts.

Besides the 15 departments, the city owns six public companies (e.g., Waste Management Company (AWM), Munich City Sewage (MSE), etc.) to fulfil the tasks a large city like Munich has. The last city council elections led to a change in the departmental structures: to emphasise current challenges, such as climate change or mobility transition, a new Department for Climate and Environmental Protection (RKU, since 2021; former part of Department of Health and Environment, RGU) and a new Mobility Department (MOR, since 2022) have been formed.

In relation to CCA, we identified four relevant departments and one publicly owned company within the city administration. A table with details of the selected city departments, including main departments and their general functions, can be found in the Appendix A (No. 1 in the Data Availability Statement: Table A1).

Most of the city departments consist again of different main departments. For example, the City Department for Urban Planning and Building Regulations has at least five hierarchical levels (see Figure A1 in the Appendix A: No. 2 in the data availability statement). The head of the city department is the city planning councillor, supported by the office of the head of the city department, the management, and the housing manager. This is followed by the heads of the four main departments: Urban Development Planning, Urban Planning, Urban Renewal and Housing, and the Local Building Commission. Each main department has five to six heads of sub-departments followed by the next two levels: the team leaders and the administrative staff. The other city departments are similarly structured, but the number and size of the individual main and sub-departments may differ.

In addition to public actors from city administration and politics, a diversity of semi-public and private actors such as citizens, NGOs, landowners, and investors are involved in the land use conflicts relating to urban development and CCA.

3.2. Methods

For this study, we build mainly on semi-structured expert interviews and a document analysis to identify the formal and informal collaborative arrangements used to support CCA within the city administration and between the city administration and other relevant actors. Individual expert interviews allowed us not only to identify informal or undocumented collaborative arrangements, but also to gain insights from experts about the barriers and potentials related to these arrangements. The document analysis provided insights into formal cooperation agreements and allowed the interview outcomes to be

verified. This combination of methods yields additional knowledge compared to a single method, and provides insights from different perspectives and levels, contributing to the validity of the case study [51].

3.2.1. Semi-Structured Expert Interviews

Within the research context of the accompanying planning processes in the case study, we conducted a stakeholder analysis to identify relevant actors within the city administration involved in the planning process related to CCA. The selected administrative staff members are either, engaged in spatial or environmental planning, or more generally deal with spatial or land-use-related issues. They came from four different municipal main departments and one public owned company. In total, we conducted 15 semi-structured interviews. The majority of the interviewees belonged to the Department for Urban Planning and Building Regulations as the largest and central department for city planning (detailed table see Appendix A: No. 3 in the Data Availability Statement, Table A2).

As part of the research project, a second group of eight experts was interviewed. They were selected due to their expertise in spatial or environmental planning related to Munich but were not part of the city's administration (detailed table see Appendix A: No. 4 in the Data Availability Statement, Table A3). The survey of this group was conducted to supplement the internal perspective of the municipal staff with an external one and to give additional insights into external collaborative arrangements. Their recruitment followed the snowball principle: they were contacted after the first group of interviewees identified them as relevant for our research questions. Statements made by these interviewees are clearly marked as external opinions, as they do not necessarily reflect the administration's point of view. However, these statements provide important insights into barriers to collaborative governance in the Munich context.

Semi-structured interviews were conducted in 2020 by one of the authors and an employee of the City of Munich, who took part in the research project. Due to the coronavirus pandemic, only a few interviews took place face-to-face. For most interviews, we used video conferencing tools (Zoom, Skype, Microsoft Teams or Webex). Interviews were, as much as possible, conducted on an individual basis to allow interviewees to speak freely without peer pressure. In general, the interviews lasted between one and two hours. The interview topics were thematically divided into two blocks: CCA and collaboration/working structures. The questions in block one addressed the potential for mainstreaming CCA into planning, the accompanying necessary improvements and barriers, and influence of CCA mainstreaming on daily work routines. The questions in block two addressed participation and collaboration in planning: relevant actors and decision making stakeholders, frequency, intensity, evaluation, and perception of collaboration with other actors. Identifying key actors allowed us to gain a better understanding of the interactions between actors in vertical and horizontal structures. The interview structure within the two blocks was flexible to allow for a more natural flow of conversation. The interview questions were slightly adapted for each interviewee, but the main questions were not fundamentally changed (an exemplar of the interview guide is shown in the Appendix A: No. 5 in the Data Availability Statement). Additional follow-up questions were asked for clarification and deeper understanding. All interviews were audio-recorded and then transcribed.

3.2.2. Secondary Sources Analysis/Document Analysis

Throughout the research phase, we collected various documents that could give us indications about the structures and work processes. These were public and organisational documents, such as regional policy documents on spatial planning and CCA with urban green or strategic plans, digital material, such as web sites, as well as private documents, such as meeting notes, protocols, and e-mails. The official documents or other information used for the analysis are listed in the Appendix A (Data Availability Statement; No. 6–8).

3.2.3. Data Analysis

For the qualitative data analysis, we used the software MAXQDA. We used a two-step procedure for coding the content of the interviews and documents. One of the authors and an employee of the City of Munich, who took part in the research project, conducted a first round of coding following an inductive approach, in which coding categories and sub-categories from the themes emerging from the interviews were developed [52]. Both partners coded half of the interviews and then coded each other's interviews to ensure consistency. The codes were described and defined together to prevent ambiguities and disagreements when processing the analyses. In addition, the coding process and the results were regularly discussed to ensure matching understandings. Figure 2 shows the main initial categories after the first step.

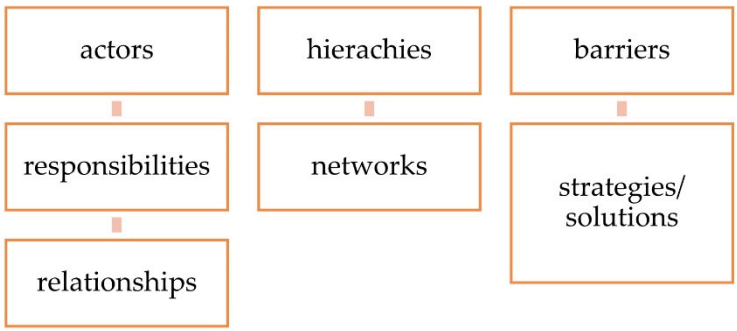

Figure 2. Initial categories followed by an inductive approach.

In a second step, we adjusted, restructured, and detailed the first code list based on our conceptual framework. Table 3 shows the further developed coding categories. Two of the authors were involved in the coding process of step two. In line with the categories developed, the collected documents were also scanned and coded for information about structures and work processes within the administration. These documents we analysed further according to the categories developed. We discussed the further development of the codes together and then reviewed the interviews again and adjusted the codes where necessary.

Table 3. Categories after step two.

Categories	Description
type of actors	actors involved in the urban planning process, types of actors, knowledge and expertise
conditions	motivation, discourse, knowledge, and expertise
responsibilities, structure, and function	tasks in the process, professional (thematic) responsibility, decision making power
collaborative arrangements	structure and direction of arrangements (either horizontal or vertical), collaboration within the municipality, horizontal dependencies, collaboration with external actors, internal arrangements and structures of arrangement, interaction format, function of arrangement
hierarchical structures	vertical structures between actors within the municipality and the local politicians
relationships (mutuality)	level of interaction/collaboration, dependencies, interpersonal relations, commitment, mutual understanding, assessment/evaluation of collaboration
barriers	as reported by actors regarding collaboration and governance structures
strategies/solutions	as reported by actors regarding collaboration and governance structures

4. Results

In line with the analytical framework, we defined three planning arenas for CCA in Munich. We explore the planning arenas by presenting the decision making positions, functions, and structures and the responsibilities of the actors in each planning arena. This is followed by an analysis of the collaborative arrangements and hierarchical structures between and within the different planning arenas.

4.1. Planning Arenas in the City of Munich: Actors and Conditions

In Munich, the actors who address urban planning and CCA are found in different planning arenas, which are nested into another. Figure 3 depicts the diversity of planning arenas (A, B and C) and their stakeholders in relation to CCA as well as their embeddedness. The city administration with its 15 city departments (C) forms the main planning arena within this study of embedded planning arenas. Included in the city administration's departments are main departments which in turn are embedded sub-departments. The planning arena of the city administration is nested in the planning arena of the City of Munich, which also includes its political and decision making actors (B). This planning arena is again embedded in a larger and more diverse playing field of external public and private actors, such as citizens, NGOs, landowners, and investors (A).

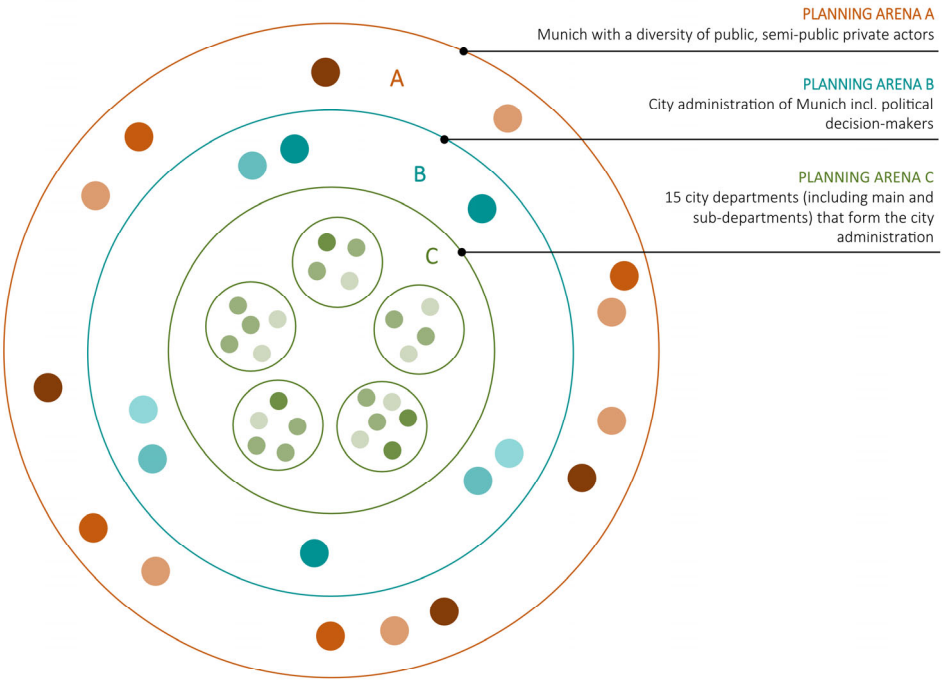

Figure 3. Planning arenas for CCA in our case study of Munich. The different shades of a colour illustrate the heterogeneity of the actors in the individual planning arenas.

Planning arena A is the largest arena. Most interviewees as well as the analysed documents stated that the number and variety of stakeholders in planning arena A has increased steadily in recent years and led to an additional management effort for the city administration. The structure and the degree of organisation, as well as the functions of the individual actors, vary greatly from well-organised associations to non-organised groups of citizens, as does the decision making power. Due to the complex constellations, the framing conditions, positions, and the responsibilities of each individual actor cannot be presented in detail. Instead, we present two exemplary stakeholder groups.

Because of building pressure and the shortage of available area for urban development, key external actors in relation to CCA are investors, project developers and landowners. They are co-responsible for the development of the land, also from an ecological and social point of view. These actors are mostly highly motivated to collaborate with the

administration, but different viewpoints often emerge in the context of CCA, especially when it comes to the competition between public and individual interests. The knowledge and expertise regarding CCA is quite heterogeneous, but in general basic. The financial, time, and technical resources are comparatively high.

Other key actors are citizens. In recent years, it has been observed that an increasing number of citizens and citizen initiatives are interested in preserving green space. One well-known example in Munich is "Green City e.V."—an organisation that has been active for over 30 years and works as a local environmental organisation for a "green, liveable and sustainable Munich" [53]. The motivation of citizen initiatives to collaborate with the administration is high. Since these initiatives are usually also oriented towards overarching public goals, their values can be similar to those of the administration. Their knowledge and expertise in the context of CCA is less heterogeneous and can be profound, so the collaboration can be beneficial for both sides. Compared to investors, project developers, and landowners, the financial, time, and technical resources are rather limited.

Planning arena B includes the administration and the local politicians. The willingness to collaborate is high and the actors are dependent on each other. The collaboration is highly regulated compared to the other planning arenas since the authority is centralised. The viewpoints can differ from the political and professional perspectives but concerning CCA they often share common values. The knowledge and expertise of the politicians regarding CCA is—except for experts in the individual political parties—not very deep. Planning arena B is responsible for CCA goal setting and implementation. Although the importance of CCA has increased significantly in recent times, the financial, and time resources for CCA are limited depending on the political and budgetary situation.

The city administration with its 15 city departments is defined as planning arena C. Unlike the political higher-level management structure, the administrative structure with its 15 city departments is constantly changing—and these changes depend on the political aims, who have also recently been demanding more efforts in CCA. Based on the statements of several interviewees and through our own observations, it can be determined that the city administration of Munich is characterised by a large number of well-trained experts (such as academics with PhDs) compared to other city administrations. The knowledge and expertise in the context of CCA is profound. As described in chapter 3, we identified four relevant departments and one publicly owned company within the city administration in relation to climate change adaptation.

In most cases, the Department for Urban Planning and Building Regulations is at the centre of urban planning issues. This is where the planning processes are handled and collaboration with other departments is coordinated. CCA through urban green in planning is steadily increasing in importance and has become an important field of activity for the whole city department, but especially for the sub-department of green planning. Due to this emerging new field of action, they share a common viewpoint regarding the collaboration within the city department. This also applies to the Department for Climate and Environmental Protection (formerly: Department of Health and Environment; C2). CCA is one of the main goals and tasks of the department. As these two city departments share the main responsibility for CCA, and have the necessary resources to do so, the motivation to collaborate is high, even if the concrete approaches to solutions may differ. Important, but rather indirect roles in CCA with urban greening are played by the Building Department (implementation of planning, green space maintenance), the Municipal Department (land acquisition) and Munich City Sewage. Their knowledge and expertise in the context of CCA depends on the sub-department. The motivation for collaboration with the other city departments in charge of CCA is high, but due to a lack resources, limited. Further city departments, such as the Social Department, have no obvious responsibility, and their motivation to collaborate is therefore rather low. When asked about CCA, the persons contacted in these departments referred to other departments and they were also not mentioned as important actors by the persons interviewed.

Also part of planning arena C are the main departments and sub-departments of each city department. The administration and thus also the individual city departments are hierarchically structured, as the interviewees and the organisational charts (example is shown in the Appendix A, No. 2 in the Data Availability Statement, Figure A1) illustrate. According to the interviewees (employees and external experts), the fact that the City of Munich has many and sometimes very hierarchical levels is because it is a very large city, and the hierarchies usually increase with the size of the city and the size of the administration. Within the hierarchical structure, there are clear instructions on how work and planning processes are carried out and which staff level has decision making power. The lower hierarchical levels have in general little contact with higher hierarchical levels, as one cannot just simply skip any hierarchical level. The motivation for collaboration is high, but strongly dependent on the topic or planning task, since some sub-departments have the same competences but different areas of responsibility (e.g., "II/3 East District" and "II/4 West District"). Due to the objectives set by the departmental management, the individual departments often share definitions of problems and approaches to solutions.

4.2. Collaborative Arrangements in Horizontal and Vertical Structures: Relations, Positions and Power Distributions

Horizontal collaboration within the City of Munich can be observed on different levels: collaboration within and between the different city departments (planning arena C); collaboration within the City of Munich (planning arena B); and with external stakeholders (planning arena A).

4.2.1. Collaborative Arrangements within and between the City Departments (Planning Arena C)

Even if the hierarchical structure basically defines the decision-relevant processes, interviewees reported that horizontal collaboration plays an increasingly important role, both in (I) collaboration within a city department (between the main departments of a city department) and in (II) collaboration between the different city departments. Generally, it can be said that collaboration within a city department is perceived more positively than collaboration between the city departments. However, the exchange and horizontal collaboration is strongly dependent on the main and sub-departments and the planning tasks. Some of the city departments work more closely together than others due to thematic dependency (see 4.1). The hierarchical structures also play an important role when it comes to collaborative arrangements.

Structures and Relations within the City Departments

Like the hierarchies between the political and administrative levels, the hierarchies within a city department are also generally accepted due to the size of the administration and the number of different departments and planning teams. Nevertheless, disadvantages are also attributed to these structures, e.g., because the time required for decision making processes across several hierarchical levels is very high:

> *"It would perhaps sometimes be preferable if decision-makers, real decision-makers, were [. . .] not another four hierarchy levels above, because the person in charge is not a decision-maker, they still have to comply with a hierarchy. [. . .] And that makes it very time-consuming."*

This challenge is also confirmed by experts who do not work in the administration of the City of Munich. For them as outsiders, pronounced hierarchies are associated with long planning process times (coordination processes are characterised by constant loops in the hierarchy) and potential for conflict, if the administrative staff at the lower hierarchical levels are not authorised to make decisions.

The subject of CCA has given more importance and weight to green and environmental planning, which has also led to the creation of new positions and new task areas, especially in the city departments RKU and PLAN. In some cases, integrating the topic of CCA

has created new work processes and collaborative arrangements, which have become established over time or are still being established. One example of new work processes, in this case a new instrument or a new guideline, is the climate roadmap [54], which is to be understood as a process instrument that complements the regular development plan procedure and as a guide for climate-friendly new building districts for all actors involved in development plans, such as the administration and external actors. They must adhere to the components of the guidelines if they want to develop neighbourhoods or building projects in Munich. One of the components is e.g., the requirement that an expert on climate change issues sit on the jury of an urban planning or architectural competition. The collaboration between the different actors (within and outside of the administration) is obligatory and demanded by local politics.

However, the work processes and the collaboration regarding CCA are not yet sufficient in all planning projects and the locus of authority may remain ambiguous. In a few cases main or sub-departments did not sufficiently coordinate or exchange information on certain planning projects or decision making processes—despite the need to do so. There are cases where a sub-department feels "left out" although according to their own statements they should be involved. Main or sub-departments that have had little contact with CCA so far would like to see more guidelines, more information and more collaboration from the other city or main departments.

Structures and Relations between the City Departments

There are no official hierarchies between the main departments. However, there are topic-specific and project-dependent responsibilities and actor roles. According to the interviewees the responsibilities for most of the established themes are acknowledged by the administrative staff and legitimate. New and cross-departmental topics such as CCA with UGI give rise to conflicts as these relations are not clarified yet. These potential conflicts are usually based in the unwillingness to give away responsibility by actors at higher hierarchical levels. They also wish for different structures of arrangement, especially to have fewer constraints and to make more decisions on their own and avoid coordinating every decision in vertical and horizontal loops.

Horizontal collaboration is mostly based on individual building and planning projects, often within a legal framework, while informal formats of collaboration and exchange are less standardised and regular. Interviewees cited lack of time and personnel resources, lack of motivation ("thinking in silos"), difficulties in identifying the right group of people, and an appropriate group size as reasons for that. Interpersonal aspects play an important role in interdepartmental cooperation. Collaboration and communication sometimes fail because those staff members responsible do not get along with each other or have different opinions on the planning issue, especially when this collaboration is not standardised and obligatory. Thus, the commitment to regular exchange is often dependent on people, and collaboration is not formally demanded, as in the climate roadmap, for example.

Requirement for CCA with greenery in urban development has been addressed for several years but is not yet mainstreamed in all relevant departments of the city. However, over time in more and more cases, regular informal horizontal collaborative arrangements take place, e.g., in the form of monthly meetings: A recently standardised collaborative arrangement is a monthly meeting between the PLAN and RKU on the topic of the "Green City of the Future". This meeting was initiated as part of the research project and has since become established. The collaboration between the two city departments RKU and PLAN is considered close by most respondents. Another example is a monthly meeting between RKU, MSE and PLAN on the topic of the sponge city.

Generally, we noted that a positive tendency towards more CCA integration is recognised by most respondents. According to the interviewees, collaboration in the thematic complex of CCA through UGI is—to some extent—very good and tends to get even better through time, although employees still have to get used to new structures of arrangements and coordination mechanisms. Introducing new work processes can be tricky at first and

new standards "take time to get up to speed". However, the people interviewed say that awareness is increasing among all stakeholders, and thus the willingness to adopt new and more various horizontal collaboration and work processes. Early coordination between certain departments is seen as very positive.

> *"And that is why we have chosen always to coordinate with the RGU at a very early stage. There is a joint paper on which cases require such an expert opinion and which cases do not. And that is actually going quite well now. So that was essential. [. . .] Without them we would really have had a huge problem."*

Larger deficits are associated with implementation and monitoring. Regardless of the timing or intensity of participation of different city departments, their responsibility for involvement often ends with planning. Responsibilities for monitoring or follow-up are not defined. The departments no longer take note of whether and how planned measures are implemented or carried out. One reason for this is often the shortage of staff, but also the way in which the responsibilities and the political priorities are defined. One of the biggest barriers according to interviewees is thinking and acting in "silos", causing lack of exchange and communication, resistance to giving away responsibilities, and lack of transparency. Personal aspects and interpersonal relationships also play an important role. Even if these are partly only indirectly related to the existing structures, they have an influence on the level and frequency and therefore on the success of the collaboration in individual cases. Table 4 summarises the barriers that have been identified by interviewees.

Table 4. Barriers linked to collaborative arrangements within and between the city departments from the administrative point of view.

Barriers from the Administrative Point of View	Illustrative Quotations
thinking and acting in "silos"	*"Yes, in principle, it would always be desirable to see ourselves more as a city and less as a department."*
lack of collaboration	*"That's exactly the problem, that we give an opinion and then basically the issue is taken up without our involvement and we are simply confronted with the final outcome."* *"And then we find out, whoops, it was approved in a completely different way or the building development has expanded or for some other reason it is no longer possible [. . .] These are the issues where we realise that our concerns are still being neglected, yes."*
lack of transparency	*"Yes, as a rule, when a development plan is drawn up, we are listened to, and can also give our opinion. However, our experience is that it sometimes is adopted, sometimes dropped, for whatever reason."*
interpersonal aspects	*"However, perhaps got a bit overlooked with the change of staff [. . .]. Maybe we can push that again."* *"Perhaps it was also because I couldn't work with person [. . .] at all."*

To foster more regular communication between the departments and more informal regular meetings, interviewees suggested several strategies and solutions. These include creation of superordinate positions, which facilitate and coordinate the collaboration. These positions could mediate between the departments and identify relevant actors and ways to share responsibility. Furthermore, competences of other departments can be employed to facilitate planning processes and to strengthen collaboration. Guidelines for collaboration in planning projects were also seen as a way forward to enhance the exchange. These suggestions aim at strengthening network structures in the administration.

4.2.2. Collaborative Arrangements within the City of Munich (Planning Arena B)

Political objectives are key for collaborative arrangements between political actors and the city administration with respect to CCA. The interviewees all agreed that political objectives are crucial for the enforcement of CCA goals through UGI. The political decision-

making processes have recently been in favour of CCA, but for many respondents they do not go far enough and are not radical enough. According to some interviewees, it is more important for the local politicians to provide affordable rental housing and to keep the current high target figures in mind than to pay attention to the provision of green spaces for CCA. Thus, the motivation of actors in this planning arena are more likely to differ.

Due to the hierarchical structures, the level, and the frequency of interaction between administrative staff and local politicians is low. Usually, only the heads of the city departments speak to the city councillors, and this is interpreted as a lack of exchange. The respondents would like to have more informal exchange with local politicians. However, the long duration of the processes was seen as a more significant barrier. Decisions often have to pass through many hierarchical levels, which lead to a long decision-making process. The long processing time has a negative impact on relations with external actors. Furthermore, in some cases, the political actors can come to a different assessment than the administration and then take the assessment of decisions away from the administration. The administration then must accept the outcome without necessarily approving of it. This this in turn can lead to a lack of trust, exacerbated by the lack of exchange. Some interviewees remarked that the political influence on the administration has increased in recent years. They also complained that their expertise is not valued enough in some cases and that they are limited in their actions since they are dependent on local politics for the provision of resources (for a summary of the barriers, see Table 5).

Table 5. Barriers linked to collaborative arrangements between administration and political actors.

Barriers from the Administrative Point of View	Illustrative Quotations
long decision-making processes	"*When you talk to small municipalities that have exactly the same funding programmes, you sometimes wish you had a mayor who would say, 'Let's do it now.' Then the matter would be decided in seven minutes. By the time I get through all the committees, seventy days have been lost.*"
lack of exchange	"*I think it would be really helpful to have more exchange with local politicians in order to discuss the individual issues and not only the formal levels of the committees.*"
lack of trust	"*And if you look at many discussions, they are always socially, politically very emotional and not always rational. So the administration's proposal may not be adopted." (By the local politicians—authors' note)*" "*What we would really like to see more often is that our professionalism is recognised by politicians. It really is the case that we are in the wonderful position in the state capital of Munich of being able to afford really good professionals, but we often feel that it is absolutely necessary to seekexternal consultation, which is also completely legitimate.*"
lack of resources	"*However, to change or adjust old development plans, which would be legally possible and would also make sense in many cases, seems to fail not only because of the duration, but also because of the capacity, because it also raises costs.*"

Based on their experience, administrative staff suggested more exchange with political actors on an informal level, and a political prioritisation of CCA in planning to overcome these barriers. This also includes developing new informal instruments to foster interdepartmental and interdisciplinary collaboration and the further development of existing instruments, including regular updates and involvement of all relevant departments. However, the most important strategy for strengthening CCA is seen in shifting decision-making powers to lower hierarchical levels. This would help to speed up planning, increase appreciation, strengthen trust, and save resources.

4.2.3. Collaborative Arrangements between the City of Munich and External Stakeholders (Planning Arena A)

Among the various stakeholders in planning arena A, interviewees identified landowners and investors as well as citizens as highly relevant stakeholders. Both can function as enablers or preventers of CCA with urban greening.

Landowners and Investors (Include Project Developers)

Collaboration with landowners and investors usually takes place within the context of urban development or construction projects. The protection of property secured in German Basic Law prevents direct access or direct influence by the municipalities if the owner does not consent. As a rule, binding planning only exists through development plans with green space plans. Without this formal instrument, owners cannot be easily forced to implement planning goals desired by the city, such as enhancing green or limiting soil sealing. In addition to the formal mandatory exchange formats (in the form of a building application submitted to the Local Building Commission, a main department of the PLAN city department), there are also informal discussions about the goals and requirements of a planning process.

The success of the dialogue depends on various aspects. Negotiations with people who regularly plan building projects in Munich and are therefore interested in good relationships usually progress well. However, motivations of actors often collide. Property owners are not always the ones wanting to slow down climate-oriented projects; in some exceptional cases the owner is ecologically oriented and wants to realise intensive CCA with urban greening while departments for heritage protection or urban planning do not agree. The administrative staff reported very positive experiences with housing associations and rather complicated collaborations with residential property owners' associations. In general, planning procedures and collaborations are less complex for the administration if fewer stakeholders are involved in the negotiations. The composition of those involved in the planning plays the decisive role for most of the people interviewed. In cases when stakeholders have demands going beyond the granted building rights, the city can use this as an advantage to enforce higher standards for climate and public welfare-oriented concerns. However, the demands of the city should not be too high. Despite the investment-friendly situation in Munich, there are fears in the administration that large project developers will withdraw if the requirements are too strict.

In the case of large and publicly visible construction projects, the power distribution, and their locus of authority between the administration and those involved in planning is complex. Generally, both parties are dependent on each other. Thus, the city has legal means to control urban development, e.g., through the city-wide open space design statutes, which require greening or the new climate roadmap. Planning goals are negotiated in informal meetings which, according to statements by administrative staff, are now increasingly accompanied by lawyers representing the investors. In many cases, the discussions are about how much residential and commercial space can be created, which kind of public welfare-oriented contribution the investor has to provide, and what the ecological and green space-related provision of the project should look like from the city perspective. The presence of lawyers and prior experiences with lawsuits limits municipal willingness to experiment with new regulation and solutions. Accordingly, lack of trust and profit orientation are also perceived as a very big barrier.

The Issue of CCA through urban green space plays an increasing role in larger projects and leads to many departments being integrated in the decision-making processes. Due to these many planning participants and the vertical and horizontal structures, often not all relevant decision-makers from the city departments are at the table in these discussions, so decision-making and negotiation processes can be severely delayed, as they must cross all vertical and horizontal levels. This in turn often leads to resentment on both sides: The investors push for faster decisions, and administrative staff have to deal with this pressure.

The conclusion is that the more complex the building project, the more city or main departments are integrated into the decision-making processes, and the more distinct the horizontal, but also the vertical structures are, and the longer the coordination, planning and approval processes will take. This in turn impacts the relationship building with investors and landowners. Table 6 shows a summary of barriers.

Table 6. Barriers linked to collaborative arrangements between administration and external stakeholders.

Barriers from the Administrative Point of View	Illustrative Quotations
many different actors with different requirements, e.g., residential property owners' association (WEG)	*You should never start with a residential property owners' association, because someone is always against it."* *"What's really bad is that I have to deal with a WEG, which means almost nothing works."*
lack of trust and transparency	*"In about 10% of building applications, lawyers also involved from the developer's side right from the start."* *"There are also cases where things are promised in the consultation process but are not included in the submitted building application."*
profit orientation	*"People want more than they are legally entitled to, for example in terms of building law, or they want to avoid expenses."* *"In the guise of technical issues, as a building permit authority, we also basically have to manage two original sins: greed and avarice."* *"And of course, the investor is primarily interested in earning money. And I would say that the common good and making money can sometimes go together, but in my experience, it is usually not the case."*
long decision-making processes	*"It would perhaps sometimes be more favourable if decision-makers, real decision-makers, were [. . .] not another four hierarchy levels above, because the person in charge is not a decision-maker, they still have to comply with a hierarchy. [. . .] And that makes it very time-consuming."*
lack of willingness to experiment	*"So especially with new legal regulations, it is of course always possible that someone tries it on. And then someone sues. Someone always sues in Munich. We have many lawsuits, hundreds every year."*
lack of possibilities to influence due to legal provisions	*"If something is legal, no matter how [. . .] morally or even technically out of date, if it does not violate a building code regulation, it has to be approved."*
lack of acceptance of binding planning instruments	*"Our experience teaches us that people do not like to be forced into things and will always resist."*
bias and negative public image of the administration	*"Because it is often the case that there are still certain opinions among the population that we in the administration simply stick to the rulebook regardless."*

Citizens

Collaboration between the citizens and the municipality can take place for different reasons and come from both sides. If the initiative comes from the city, it is usually an information or participation mandate and often has the goal of creating acceptance among the population. This can be in the context of smaller or larger development or construction projects or also for general, city-wide topics, such as for the current urban development plan "STEP 2040" [55]. This collaborative arrangement was carried out within the setting of an online dialogue. In this context, the population could submit suggestions for the urban development plan and evaluate other suggestions. The best rated proposals were discussed in an event together with the head of the Department for Urban Planning and Building Regulations and the head of the main department of Urban Development Planning. The formats for these processes are diverse and differ depending on the objective: there are formal procedures, e.g., in the context of urban land use planning and informal procedures, which can vary depending on the task. Who is to be involved or informed is decided according to the particular project. The City of Munich has its own main department in

the PLAN city department to support communication with the public: the "Plantreff" an institution specifically responsible for public relations.

If the initiative comes from the population, it can also be a citizens' initiative. These can have the goal of preventing or changing planning projects. Depending on the size and intensity of the commitment, these initiatives can create a lot of pressure on the administration and in the end lead to a change in the planning or to a planning halt, see [56]. The level of interaction between initiatives and the city administration or politicians depends on the project and there is not always a direct exchange between these actors from the outset, and sometimes the arguments are only made public in the local media, reflecting a lack of trust and lacking mutual understanding.

A case where land use conflicts become apparent is public participation in urban planning. In recent years it has been observed that an increasing number of citizens' initiatives are interested in preserving green space. However, this does not lead to simplification. Participation with the population is seen as very ambivalent by the city administrators.

> *"Because it's planning. It's not just wishful thinking."*

Even though participation as a collaborative instrument is not questioned by most respondents, it is also seen as time-consuming and exhausting. Since planning processes often take a long time (up to 15 years in urban redevelopment), some objections might be outdated by the time the plan is finalised but still need to be considered in the planning process. According to the respondents, public perception of urban development is often negative.

> *"But, yes, I think that urban society has now reached a point where it is really difficult to communicate planning, changes, redensification."*

Participation can be very selective and often takes place after the initial goal setting, when certain framework conditions have already been established. Negotiable aspects of planning are selected by the responsible persons.

> *"The big problem, from my point of view, is that often only information is provided, or can be provided, but the citizens want to participate."*

Interviewees stated that participation can only succeed and achieve desired outcomes for CCA if it is well supervised, and the framework conditions are clear and transparent. Such, participation is not always beneficial for CCA integration: in some cases, it slows down planning processes and does not lead to improved CCA. Most respondents from the administration were willing to try out new approaches—the prerequisite being sufficient human and financial resources.

External experts and planners felt that it would be necessary for administrations to be more courageous in their collaboration with external stakeholders and allow room for experimentation. This requires a change in society as a whole, and a culture for forgiveness of possible mistakes. The lack of willingness to experiment is due, among other things, to concerns about increasing complaints from the population.

Major barriers in planning arena A related to lack of trust, power imbalances and lack of understanding. Some of the interviewees expressed strategies to overcome the barriers. They state a need to better explain the requirements of CCA to gain greater acceptance for it. By raising awareness and by communicating urgency, responsibilities can also be better shared, and private property developers can be held responsible. From the administration's point of view, a balanced selection of participants appropriate to the planning task is also important.

5. Discussion

5.1. Collaborative Arrangements in Different Planning Arenas

The collaborative arrangements in Munich differ depending on the planning arena. A major commonality between the individual planning arenas is the direction of the interaction: between the "internal" planning arenas B and C the directions are especially

hierarchical. In all planning areas, though, a variety of horizontal structures were also recognised, and these seem to be increasing. However, development of these horizontal structures increases complexity for several reasons. One reason is the increasing number of actors involved, which requires more management and coordination. Moreover, horizontal structures do not alter the vertical structures and the formal institutions with respect to all the rules and guidelines but are rather added as additional layers. Therefore, not only does the number of actors increase, but the structures and processes that need to be considered.

The level of interaction depends on issues such as superordinate and cross-departmental tasks, such as urban development plans, or on a real-world planning project dealing with CCA. The level of interaction with external stakeholders (planning arena A) is occasionally very high and was perceived by administrative staff as not being focused enough with too many actors and non-transparent processes. The level of interaction between and within planning arenas B and C in the context of CCA is increasing but is sometimes still very low and needs to be further developed. Here our results suggest that the degree of formal institutionalisation seems to hinder horizontal collaboration, because the strongly hierarchical structures with defined responsibilities and competencies are relatively inflexible and prone to path dependencies which are difficult to overcome.

5.2. "Silo-Thinking", Communication Bottleneck, and Hierarchies as Barriers to CCA Mainstreaming in Collaborative Arrangements

Our results revealed that administrative staff are dealing with a broad array of challenges inherent in existing structures and pertinent to several planning arenas. Most of the challenges are related to lacking or insufficient horizontal and also vertical collaborative arrangements.

Within the administration (planning arena C), interdepartmental, informal collaboration is often absent. At an institutional level, the reason can be found in competition between departments and power struggles, i.e., when departments do not want to relinquish areas of competence or responsibility. Acting and thinking in "silos" is regularly addressed as a barrier to collaborative governance approaches in other research [14,25,57]. Wamsler et al. [25] emphasised the necessary paradigm shift from working in "silos" to more intersectoral work and named improving informal networking and communication as an approach to overcoming this barrier. In order to establish these informal networks, commitment from individuals regarding time resources and motivation is required, as well as the cognitive capacities to build trust and achieve mutual understanding. Organisational structures need to provide room for this type of informal exchange and allow time for piloting; however, these (non-material) resources are not always available, especially in strong hierarchical structures, when informal horizontal collaboration is voluntary and time is required to report decisions up and down the hierarchy. In addition, engagement can also fail due to interpersonal difficulties, as we saw in our case study.

In planning area B (administration and political decision-makers), we observed a lack of vertical collaboration structures in turn resulting in a lack of transparency and a shared common vision for how to achieve certain policy goals. We suggest this might be aggravated by strong hierarchical structures with a high number of hierarchical levels, as are typically found in bigger cities. Power struggles are more apparent in bigger than in smaller municipalities, whereas direct contact between political decision-makers and administrative staff is more limited in the former. In the case of the City of Munich, direct communication between administrative staff and political decision-makers is reduced to the heads of the city departments ("communication bottleneck") and otherwise highly formalised. In our case study, administrative staff working on planning projects and who were faced with actual planning challenges partly lacked understanding of political decisions, were nevertheless bound to them. Political decision-makers in turn need qualified staff to implement political goals but might lack information on successes and barriers if information has to be passed on to several hierarchical layers. Comparing two Swedish cities, Wamsler et al. [25] observed that the influence of individual advocates, which are important for sustainability

transformation, was higher for the smaller city with flatter hierarchies, and that more options for quicker exchange with political decision-makers strengthened the confidence to experiment.

In the realm of external stakeholders and the city institutions (planning arena A), a lack of transparency and trust affected horizontal collaboration. The absence of administrative staff with decision-making power in negotiations with investors was perceived as leading to non-transparent decision-making processes, as topics could not be finalised at the negotiation table. Instead, issues and suggestions for alternative solutions must pass various internal hierarchical and also vertical levels (other city and main departments) to achieve legitimacy. Administrative staff reported that investors accuse the administration of hesitation, being slow and inflexible. This conflict between democratic legitimacy (input legitimacy) and quick decisions (output legitimacy) was also addressed by Hofstad et al. [14]. They concluded that co-creation and the related shift of decision-making competences should be pursued but should take place within clearly defined policy goals.

However, the distrust is mutual: the administrative staff fear lawsuits and have experienced that many investors act purely for profit and thus doubt the willingness of investors to engage in CCA. Trust has been identified as a key element for constructive negotiations between property developers and planning authorities by Holsen [58], which is largely dependent on transparent communication.

Without defined responsibilities and established working routines for cross-departmental collaboration, there is not only a lack of horizontal exchange, but also of exchange between the vertical structures, as the hierarchy levels are strictly adhered to in most cases and there are usually no points of contact between the upper and lower hierarchy levels. Professional and interdisciplinary teams in the lower hierarchical levels have hardly any decision-making powers, which is considered important [59]. Other authors equally suggest that present administrative structures are not properly prepared for dealing with complex and uncertain challenges that are typical for climate change. Cities often have difficulties transforming existing systems due to path dependencies and lock-in processes [60,61]. Instead, as Hofstad et al. point out, developing CCA solutions currently takes places through a mix of collaborative and traditional bureaucratic tools [14]. They suggest that city administrations must develop capacities to take the role of a collaborative capacity builder, who manages and coordinates co-creation processes with external stakeholders. In the case of Munich, there is a deficit of such cooperative capacity developers.

5.3. Observed Strategies to Foster CCA Integration

We discovered three interesting activities related to CCA, that have an impact on collaborative arrangements: (I) the creation of new city departments, (II) introduction of policy guidelines as informal and interdepartmental instruments and (III) regular informal meetings between different city departments.

The creation of a new specialised city department clearly signalled the new political priority for CCA. If the department is also equipped with sufficient and qualified staff, more competencies and responsibilities, the importance of the topic increases markedly through the new specialised organisation. This development further enables a stronger vertical collaboration between political actors and administrative staff working on it. In addition, new departments have the advantage that there is scope to redesign the structures, even if they cannot break with the existing hierarchies.

However, a new structure does not necessarily lead to better networking structures and working processes between city departments. On the contrary, it may even happen that the departmental boundaries ("silos"), which are partly reinforced by an individual specialised department, may hinder or delay interdepartmental collaboration. More city departments can lead to increased need for coordination in decision making, and in turn to longer planning times and processes. In our case study, we observed that these structural changes did not mean a flattening of hierarchies, but rather a strengthening of hierarchical structures. By outsourcing main or sub-departments that were previously subordinate,

they are elevated to a higher hierarchical level, i.e., to a city department with its own set of hierarchical structures. These developments contradict other researchers' claims that new challenges require agile structures and flat hierarchies or network collaboration, as Wamsler et al. [25] and Meuleman [57] point out.

Within the City of Munich, open space design statutes are a respected and interdepartmental instrument for achieving a high quality in the development of open spaces. This instrument simplifies and enables collaboration in the context of CCA in planning arena A by prescribing certain city-wide specifications for the greening of neighbourhoods. Administrative staff have identified this as a very helpful tool because it sets a framework for negotiations with landowners. The climate roadmap, which was adopted by the city council in autumn 2021, is relatively new. This instrument also provides guidelines to which the administration and also external actors must adhere. Even if the implementation of the roadmap has not yet progressed to all levels, it has the potential to decomplex the procedures and bring more transparency and thus restore trust in the collaboration in planning arena A again.

Within our study we observed two approaches to establish CCA-related and interdepartmental interaction. Two regularly informal meeting formats (described in 4.2.1) have been introduced for informal meetings between different city departments. We observed that this successful collaboration was mostly related to specific topics or defined projects. The first was initially stimulated by our research project. Within the realm of research projects, resources and opportunities are provided to test out new exchange formats. However, the other confirms that they can also be initiated internally. Although the effort is high and resources are limited, the meetings continue to take place. This highlights the added value that the participants associate with the exchange and correlates well with other research [18,19,30,31].

To ensure that these informal horizontal collaborations continue to exist on the one hand and do not remain exceptional cases on the other, it is important to share responsibility for the organisation, as in the case described. Appropriate resources must also be made available by the leadership. Appreciation and recognition of this commitment is also beneficial.

5.4. Strategies, Solutions, and Recommendations for Urban Planning

Based on our study, the following recommendations for dealing with these barriers and ways to anchor horizontal structures in planning can be outlined:

In planning arena C, horizontal collaboration with the other city departments is crucial to ensuring that this new structure also improves the quality of CCA in planning. For this to happen, the leadership of the new and existing city departments must at least recognise the respective competences among staff and departments and allow the sharing of responsibilities. An alternative would be to create cross-cutting city departments or staff offices that translate the cross-cutting theme of CCA into horizontal structures rather than vertical ones.

An important approach to establishing horizontal structures in our case study are the informal meetings between city departments. Participation in these exchange forums requires individual engagement and confidence that the collaboration will bring benefits. Other interviewees, who are not involved in such exchanges, often wanted the opportunity for such interaction. Ideally, this collaboration should go beyond individual planning tasks. These formats require a political prioritisation of CCA and leadership supporting these collaborative arrangements. A round table, at which all the relevant authorities discuss and negotiate the objectives together fosters a trust-based and equal relationship. However, these initial discussions should not be confined to a single exchange but should be repeated regularly (according to consistency).

Regarding the internal structures of a city department, it would also be advantageous if at least some of the decision-making competencies were shifted to the lower hierarchical or even administrative staff levels. This would facilitate a more trusting relationship

between the hierarchical levels, lead to improved motivation and speed up planning processes. Additionally, newly created coordinating and superordinate positions, such as the above mentioned cross-cutting city departments or staff offices, could make a valuable contribution to better linking the individual disciplines as well as city departments. These recommendations are supported in the literature. According to Nevens et al. [59], cities have to overcome command and control mentality from politics and administration (transition trajectories are about empowerment). Trust and empowerment need time to develop and are non-tangible results at first, mediators might be required to intercede between established policies and developing transition projects, policies, and networks [59]. This promises faster planning phases and fewer conflicts.

5.5. Study Limitations and Future Research

This study has several limitations. We took care to select representative interview partners from all involved city departments and further enlarged our data collection by strategy documents, but the number of interviewees was only a small fraction of the staff within the departments. Owing to the size of the city departments, it is probably the case that some forms of collaborative arrangements or network approaches remained undiscovered if they were not mentioned by the interviewees. As our study primarily focussed on the administrative view of organisational arrangements and their impact on collaboration, the number of external stakeholders interviewed was very limited. Further interviews with different stakeholder groups in planning arena A would allow a more complete external picture of Munich's organisational structure and its approach to enhance CCA. Furthermore, our study was conducted during the coronavirus pandemic. The pandemic and following lockdowns not only influenced the way interviews were conducted (not face-to-face, but with video conferencing tools), but potentially also affected collaborations within the municipality due increased amount of home office and introduction of remote working structures. The extent to which collaboration has changed in our case study because of the pandemic cannot be conclusively determined yet.

6. Conclusions

In this study, we have been able to expand the governance discourse in the realm of collaborative arrangements with new emerging issues, in our particular case CCA with urban greenery. We were able to show through our case study what challenges administrative staff in hierarchical structures face when horizontal approaches to planning increase. The main challenges concern both structural and personal aspects, such as a lack of horizontal collaborative arrangements, rigid hierarchies, low decision-making powers, but also individual motivation, common values, and goals.

We were also able to identify strategies to overcome these barriers. They address the shift from government to governance and imply that the hierarchies need to be flattened. If horizontal collaborative arrangements are to be successful in the long term, it is important not to simply add these horizontal on top of the vertical structures. Some hierarchical structures must be disrupted to integrate new governance approaches.

However, this is just a first step. Further research is needed for the better integration of external perspectives on organisational structures, since the network arrangements with civil actors and their potential to change path dependencies were not analysed in our study. We also see an urgent need for more research to investigate whether the coronavirus pandemic increased or decreased the likelihood of engagement in informal formats. Although online formats have reduced the effort required to get to a particular location, face-to-face meetings may be better suited to building trust and networking. To confirm whether hierarchical structures always impede collaboration and how bigger cities could be organised to both consider democratic legitimacy, but also goal efficiency [14], it is important to deepen the investigation of different city sizes. Further research is also needed to address the issue of transition pathways for large municipalities from

traditional bureaucratic formats to increased openness for other governance structures and collaboration approaches, such as co-creation.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/land11101818/s1, An example of the translated interview guide.

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Appendix A

1. City departments: General Functions and Specific Responsibilities for CCA

Table A1. General functions and specific responsibilities for CCA for each of the relevant city departments and public companies [50].

Relevant City Departments and Public Companies	Department Information and General Functions
Department for Urban Planning and Building Regulations (PLAN)	800 employees, main departments: • Urban Development Planning • Urban Planning • Urban Redevelopment and Housing • Local Building Commission—the largest building permit authority in Germany general responsibility for urban planning, urban land use planning, approval of buildings, protection of historical monuments and nature conservation, studies on demographic development, green planning, traffic planning *
former Department for Health and Environmental Protection (RGU) **, now Department for Climate and Environmental Protection (RKU)	220 employees, main departments: • Environmental Prevention • Climate Protection and Energy • Nature Conservation and Biodiversity • Environmental Protection responsible for: climate protection, CCA, environmental protection, nature conservation and sustainability; main goal is climate neutrality by 2035
Building Department	more than 4000 employees, main departments: • Horticulture • Structural Engineering • Civil Engineering • Underground Construction • Administration and Law responsible for public urban space and manages urban construction projects
Municipal Department	more than 2000 employees, main departments, and companies: • Real Estate Centre • Geodata Service Munich • Munich Market Halls • Munich Waste Management Company (AWM) • Municipal Forestry Administration • Munich City Estates responsible for housing, workspace and secure basic services, real estate management, resource management
Munich City Sewage (MSE)	more than 1000 employees, public company responsible for water protection, wastewater discharge and wastewater treatment

* At the time of the interviews, traffic planning was part of the Department for Urban Planning and Building Regulations, since January 2022 it has been a separate department (mobility department, MOR). ** At the time of the interviews, the department was called: Department for Health and Environmental Protection (RGU). Since January 2021, the department was divided into the Health Department and the Department for Climate and Environmental Protection (RKU).

2. Management structure of the City Department for Urban Planning and Building Regulations

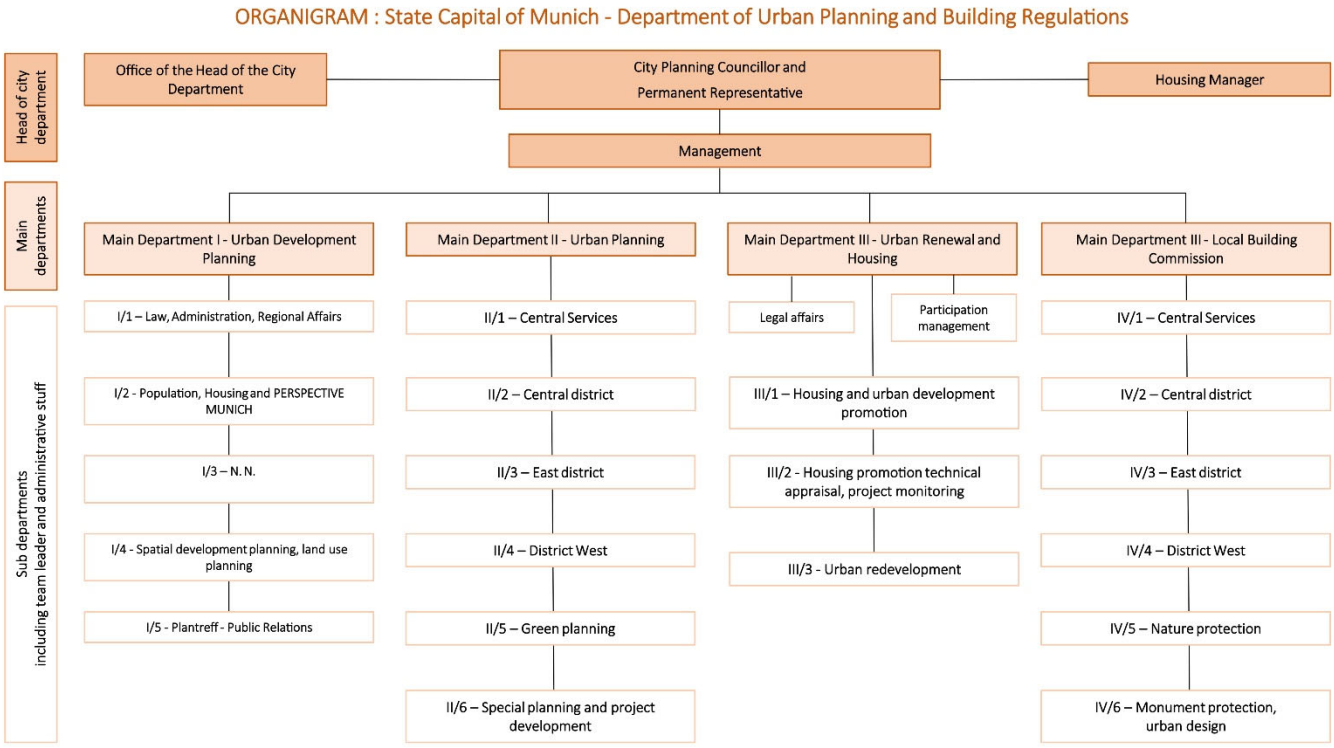

Figure A1. The management structure and the hierarchical levels in the City Department for Urban Planning and Building Regulations, adapted from [62].

3. Main interviewees

Table A2. Main interviewees.

Munich Main Departments	Interviewees	Position
Department for Urban Planning and Building Regulations (Referat für Stadtplanung und Bauordnung)	9	Spatial development planning, traffic planning, urban planning, green planning, urban redevelopment, green expertise, planning permission
Department for Health and Environmental Protection (Referat für Gesundheit und Umweltschutz)	2	Urban climate, groundwater, climate adaptation; environmental protection in spatial planning
Building Department (Baureferat)	1	Horticulture
Municipal Department (Kommunalreferat)	1	Real Estate Service
Munich City Sewage (Münchner Stadtentwässerung)	2	Property drainage, overall drainage planning
Total	15	

4. Additional interviewees

Table A3. Additional interviewees.

Experts Outside the Munich Administration	Interviewees	Background, Reason for the Questioning
University member	2	Institute for Urban and Regional Planning; Chair of Urban Water Management
Former city councillor	1	For insights into the collaboration between local politics and city administration from a political perspective
Employee in higher leadership level of another Bavarian city administration (smaller than Munich)	1	For comparison of hierarchical structures with smaller cities
Planner / Landscape architect	1	Owner of a planning office with experience in working with large cities (including Munich)
German Association of Cities and Municipalities	1	For insights into the legal background of administrative practices
Federal Office for Building and Regional Planning (state level)	1	Focus on building, urban and spatial development
Bavarian State Ministry for the Environment and Consumer Protection (national level)	1	Focus on water management
Total	8	

5. Interview Guide

An example of the translated interview guide is in Supplementary. The interview material and the data of the private documents (meeting notes, protocols and e-mails) cannot be shared due to ethical and data protection issues.

The following publicly available datasets were analysed in this study:

6. Articles and reports related to urban planning, CCA, land use conflicts, governmental and governance approaches in Munich:
   - Ref. [56]
   - Stadtentwicklungsplan München "Step 2040", Online-Dialog "STEP2040" geht in die Verlängerung; available online: https://ru.muenchen.de/2022/69/Online-Dialoge-STEP2040-geht-in-die-Verlaengerung-100681 (accessed on 17 September 2022)
7. Urban planning and guiding principles
   - Stadtentwicklungsplan München "Step 2040"; available online: https://stadt.muenchen.de/infos/stadtentwicklung-perspektive-muenchen.html (accessed on 30 August 2022)
   - Munich district committee statutes (Bezirksausschuss-Satzung, Nr. 20) and open space design statutes (Gestaltungs- und BegrünungsS, Nr. 924); available online: https://stadt.muenchen.de/rathaus/stadtrecht/alphabetisch.html (accessed on 30 August 2022)

- Socially equitable land use (Sozialgerechte Bodennutzung, SoBoN); available online: https://stadt.muenchen.de/infos/sozialgerechte-bodennutzung.html (accessed on 30 August 2022)
- Wohnungspolitisches Handlungsprogramm "Wohnen in München VI" 2017–2021; available online: https://stadt.muenchen.de/infos/wohnungsbaupolitik-stadt-muenchen.html (accessed on 30 August 2022)

8. Information about the Municipality
   - City council resolutions; "Rats-Informations-System München"; available online: https://risi.muenchen.de/risi/sitzung/uebersicht;jsessionid=2541A04817E864AA57A31117CDC29786?0 (accessed on 30 August 2022)
   - Structure of the municipality and the single city departments; available online: https://stadt.muenchen.de/rathaus/verwaltung.html (accessed on 30 August 2022)
   - Schedule and information of responsibilities of the whole municipality; https://stadt.muenchen.de/rathaus/verwaltung.html (accessed on 30 August 2022)
   - Schedule and information of responsibilities of the City Department for Urban Planning and Building Regulations; available online: https://stadt.muenchen.de/infos/portrait-referat-stadtplanung-bauordnung.html (accessed on 30 August 2022)
   - Information about city-owned companies, especially Munich City Sewage; available online: https://stadt.muenchen.de/infos/portrait-muenchner-stadtentwaesserung.html (accessed on 30 August 2022).
   - Munich's goals for Climate and environmental protection; available online: https://stadt.muenchen.de/infos/klimaschutz-nachhaltigkeit.html (accessed on 30 August 2022)

Notes

[1] Research partner: Technical University of Munich (TUM) with the Chair of Strategic Landscape Planning and Management (Coordination) and the Institute of Energy Efficient and Sustainable Design and Building; the Ludwig-Maximilians-University Munich (LMU) with the Department of Sociology, and the Institute for Ecological Economy Research (IÖW) in Berlin.

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