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ORIGINAL ARTICLE

Legitimacy of urban climate change adaptation: a case in Helsinki

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Abstract While there is general agreement on the necessity for local adaptation, there is a wide range of different understandings of what type of adaptation is seen as legitimate. It is often contested who should actively steer and take part in local adaptation, for which reasons and based on what kind of mandate, and with which methods. Planning theory can serve as a helpful reference point for examining the sources of legitimacy for adaptation in an urban context. From a planning perspective, adaptation is concerned with climate change as one out of many issues planning has to respond to. The layered co-existence of planning paradigms in practice suggests diverse, sometimes contradictory sources of legitimacy for urban planning and—as we claim here—also for climate change adaptation. This study examines the legitimacy of adaptation from a planning theoretical perspective in Helsinki, drawing on semi-structured interviews and social network analysis to show how adaptation is commonly understood from a rationalist perspective as an apolitical activity with local authorities' experts designing and implementing adaptation. Nevertheless, some of the central actors understand adaptation as a communicative activity and a common deliberation of solutions. The co-occurrence of disparate paradigms results in ambiguous legitimacy that can impede the successful implementation of local climate change adaptation.

Keywords Climate change adaptation · Planning theory · Social network analysis · Legitimacy · Helsinki

Introduction

The relevance of adaptation to climate change for the local level and more specifically in an urban context has been recognised in both research and policy making (Birkmann et al. 2010; Hunt and Watkiss 2011; European Commission 2009, 2013). As the implementation of adaptation has begun at the local level, it has become clear that climate change adaptation needs legitimacy. Adaptation often challenges the established institutional context, decision-making routines, and established delegation of power. This raises questions concerning the legitimacy of climate change adaptation (Manuel-Navarrete et al. 2011; Wejs et al. 2013; Tennekes et al. 2013; Mees et al. 2014). As Cashmore and Wejs (2014, p. 2) point out: "in practical terms, this means that if climate change planning is not perceived legitimate, it is unlikely that it will be prioritized".

Local climate change adaptation influences urban development as a response to either experienced or anticipated changes in the climate. As with any measures that aim to affect social and physical change, there is a wide

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range of different understandings of what kind of influence is preferred and seen as legitimate by those engaged and being affected by that change. It is often contested who should actively steer and take part in local development, for which reason, and based on what kind of mandate and how. Previous research has shown that existing institutional settings and power structures have substantial impact on the success and type of adaptation measures that are implemented (Manuel-Navarrete et al. 2011; Mees et al. 2012; Naess et al. 2005).

This contextual embeddedness means that adaptation is shaped by actor-specific characteristics, the institutional, natural and socio-economic environment, formal and informal rules and norms (Adger et al. 2005; Lehmann et al. 2013; Moser and Ekstrom 2010). For example, two broad pathways for adaptation can be identified in the Nordic countries (Rauken et al. 2014; Storbjörk 2010; Wejs et al. 2013). First, adaptation measures that build on the given prevailing institutional context yield tangible results rather quickly. Alternatively there are attempts to change the institutional settings more profoundly, which is a far slower process.

Both urban planning and adaptation can be understood as processes that deal with and try to anticipate or respond to social and environmental change in an urban context. According to the Intergovernmental Panel on Climate Change (IPCC), climate change adaptation is an "[A]djustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities" (Parry et al. 2007, p. 869). On the other hand, Healey (1997, p. 5) defines planning as "institutional mechanisms through which political communities can address their common problems about the management of environmental change in localities". Examined together, it appears that in planning, adaptation is concerned with climate change as one out of many issues planning has to respond to, whereas from an adaptation perspective, cities are only one out of many systems that have to adapt to actual or expected climate stimuli. Here, from an urban planning perspective, adaptation can be understood as an institutional mechanism that adjusts the urban system to actual or expected climatic stimuli and effects.

In the planning theory literature, the legitimacy of mechanisms to manage, influence, or guide local change has been discussed widely for many decades (see e.g. Allmendinger 2009 or Taylor 1998 for the development of urban planning since WWII). These types of urban planning are also conceptualised as planning paradigms that change and develop over time, have different philosophical roots, and assume different rationalities and ontologies (Bäcklund and Mäntysalo 2010; Allmendinger 2009). This

means that mechanisms of managing local change (both planning and adaptation) can rest on different rationales and draw on different sources of legitimacy (Bäcklund and Mäntysalo 2010; Manuel-Navarrete et al. 2011). These rationales, understood as the set of norms, values and beliefs arising from the philosophical roots, rationalities, and ontologies, shape the scope and objectives of planning and adaptation, and affect how the specific roles of administrators, politicians, and citizens are understood. These actors can take different positions, establish relationships with each other, and form networks of communication and cooperation. This means the rationales become also manifest in social networks. These networks in turn enable and restrict the involved actors in their activities (agency) and roles, and hence favour adaptation and urban planning in line with specific paradigms.

Planning paradigms can serve as helpful reference points to examine the legitimacy of adaptation in an urban context in order to understand how the implementation of adaptation is progressing in practice at the local level. This planning theoretical approach takes up the perspectives and goals of the organisations that are expected to adapt or contribute to adaptation (Berkhout 2012) and turns towards an institutional context, in which climate change is one among many challenges that require attention and reconciliation of objectives and goals (Biesbroek et al. 2009).

This paper poses two research questions: (1) what kind of climate change adaptation is considered legitimate from the perspectives of different planning theories (planning paradigms)? and (2) which sources of legitimacy climate change adaptation in practice rests on? In order to answer these questions, this paper studies the rationale for adaptation based on a qualitative case study of Helsinki, utilising key informant interviews and social network analysis. Helsinki is chosen as a case study because of previous research on planning paradigms (Bäcklund and Mäntysalo 2010) and the city's participation in and coordination of climate change adaptation activities (Haapala and Järvelä 2014; Yrjölä and Viinanen 2012).

The next section of this paper elaborates further on the relation of adaptation and urban planning, establishes links between the understanding of legitimacy in adaptation literature and planning theory, and provides a short summary of planning paradigms as central elements for the analysis in this article. The methodological section presents the rationales of adaptation, actor relations and describes the ideal or prototype networks that are in line with the paradigms. The case study of Helsinki shows that the layered and simultaneous existence of multiple paradigms in practice creates ambiguous legitimacy for adaptation and contingencies in the networks enabling the implementation of certain adaptation measures, while complicating others.

Climate change adaptation, legitimacy and urban planning

Studies on the role of urban planning in climate change adaptation show that the way in which adaptation is approached depends on the type of the planning system and the role of the individual planner (Hurlimann and March 2012; Lund et al. 2012; Matthews 2013; Wejs et al. 2013; Wilson 2006). However, the urban planning context is often taken as a factually given institutional context, rather than seeing both planning and adaptation embedded and interacting with the institutional context (Lund et al. 2012; Matthews 2013; Wejs et al. 2013; Wilson 2006). For example Wilson (2006) suggests a more proactive role for local authorities to promote adaptation in the context of the UK local authorities, but she does not elaborate further on the planners' potential for agency in a centralised planning system, which can be limited by the steering emerging from the national level (Keskitalo et al. 2012).

Hurlimann and March (2012) take a slightly wider perspective acknowledging that urban planning practice might be justified by and built on different theoretical foundations such as advocacy planning, incremental planning, or neoliberal approaches and identify several capacities of urban planning that can be utilised in adaptation. However, the question how these theories make the urban planning capacities more or less accessible to climate change adaptation has not been discussed yet.

The legitimacy of adaptation has been discussed in a number of studies (e.g. Adger et al. 2005; Cashmore and Wejs 2014; Mees et al. 2014; Rauken et al. 2014; Tennekes et al. 2013; van Buuren et al. 2014; Wejs et al. 2013). Adger et al. (2005) identify the legitimacy of adaptation in conjunction with equity, effectiveness, and efficiency as important elements for the success of climate change adaptation. Fairness of the adaptation process and the equity of the outcome are the sources of legitimacy, and this understanding follows the division into input and output legitimacy (Mäntysalo and Saglie 2010; Rauken et al. 2014; Scharpf 1999). More recent publications on adaptation understand legitimacy to depend on norms, rules, practices, and discourses that are socially constructed (Cashmore and Wejs 2014; Tennekes et al. 2013; Wejs et al. 2013). According to Cashmore and Wejs (2014), conformity or change can be situated at a regulatory, normative or cultural-cognitive level, implying a multifaceted nature of legitimacy. Manuel-Navarrete et al. (2011) use critical theory to question the legitimacy of climate adaptation by exploring alternatives to the hegemonic governance structure in the Caribbean Mexico, highlighting the interrelation between legal, normative, and 'taken for granted' elements of legitimacy.

Literature on climate change adaptation offers not only different (though overlapping) definitions of the term legitimacy and a bunch of "yardsticks" (van Buuren et al. 2014) to analyse and assess the legitimacy of adaptation, but it also highlights that the understanding of what is perceived legitimate can shift over time and depends on the contextual settings (Manuel-Navarrete et al. 2011; Mees et al. 2014; Wejs et al. 2013). Beyond broad notions of legitimacy as the general acceptability of decision, authority, and delegation of power, the definition of the term 'legitimacy' is highly context dependent (Adger et al. 2005; Tennekes et al. 2013; Hytönen 2014; van Buuren et al. 2014; Mees et al. 2014; Cashmore and Wejs 2014). Legitimacy in planning theory touches upon and cross cuts the conceptual levels and categories suggested for adaptation. Planning paradigms that rest on different rationales are associated with divergent sources of legitimacy (Mäntysalo and Saglie 2010; Mäntysalo et al. 2011).

In this article, we propose a planning theoretical perspective to examine the legitimacy of climate change adaptation. This perspective is explicitly relativist with respect to actual planning practice. The juxtaposition of several planning paradigms shows the varying weights given to conceptual categories of legitimacy (input, output, legal, normative, cultural-cognitive,…) and highlights the differences in planning approaches to climate change adaptation.

Urban planning paradigms

Several shifts in urban planning paradigms have taken place since the end of World War II. For (western) Europe, this has meant the development of the *comprehensive-rationalist planning* paradigm that has evolved towards *incrementalism* and the *communicative planning* paradigm and further to a search for new pragmatic approaches as represented in the *agonistic planning* paradigm in the recent years (Albrechts 2004; Bäcklund and Mäntysalo 2010; Taylor 1998). Although the scope and objectives of urban planning might vary from solutions to immediate conflicts to generating long-lasting visions for urban development, all of the paradigms provide a mandate for urban planning and a specific notion of legitimacy. The paradigms also assign roles to actors, such as planners and citizens, thus giving rise to typical relationships and networks of actors.

Comprehensive-rationalist planning

Here, planning is a rational activity that serves the common good. While the general goals for planning are defined on the political level, the planner provides the means as an expert with one's allegedly value-free knowledge. The

tasks of the planner include the analysis of problems, the identification of alternatives and implementation of the most suitable alternative. Thus, the planner is expected to have the means and tools to objectively assess which alternative would optimally serve the common good and public interest. Planning is organised mostly hierarchically. The planner's activities are thus apolitical while opinions (as opposed to knowledge) are expressed by politicians and citizens (Allmendinger 2009; Bäcklund and Mäntysalo 2010). The minimum requirements for the legitimacy of adaptation measures are the contribution to the common good and welfare and their assessment and evaluation by knowledgeable experts.

Incrementalism

Incrementalism (Lindblom 1959; 1965) rejects the idea that the common good can be objectively assessed and maximised, and highlights the bounded rationality (cf. Simon 1979) of planners. Due to lack of time and resources, and the overwhelming complexity of planning problems, comprehensive rationality is not considered a possibility; instead, the planners are encouraged to develop skills of "muddling through" (Lindblom 1959) in the face of uncertainty and lack of information. This makes planning more political and opens the planning process deliberately to the influence of different interest groups that fill the gaps in the planner's knowledge with complementary views and interests. Every planning step can be subject to new negotiations with different interest groups (Bäcklund and Mäntysalo 2010). Hence, this bounded rationality prioritises short-term optimisation over adaptation with longer-term goals along strategic development trajectories. While no-regret options that yield benefits within a short time horizon (from the perspective of planners and powerful interest groups) can be legitimate, any strategic long-term planning can be contested. Within this paradigm, adaptation appears as a process of bargaining between different influential interest groups, including politicians and powerful citizens' representatives. While this power legitimates influence on adaptation, the actual planning activity would stay in the hands of the planner.

Communicative planning

In an ideal case of communicative planning, argumentation and persuasion free of power structures and domination would decide the justification of an action, i.e. of planning but also of adaptation (Bäcklund and Mäntysalo 2010; Forester 1982). This approach strives for the best solution for all stakeholders based on a mutually negotiated consensus. A wide set of stakeholders is not only included in the problem-solving process but participates in the problem formulation from the beginning of the process. The legitimation of adaptation within this planning paradigm is in line with the adaptation literature's request for the participation of stakeholders (Adger et al. 2009; Dessai and Hulme 2004). This approach would result in an adaptation network with rather equally distributed knowledge provision and production. The planners and experts do not necessarily stand out as central knowledge brokers or mediators. They might, however, take a more pronounced role in consciously selecting allies and integrating marginalised groups into planning or climate change adaptation (Forester 1993, p. 64–65). The communicative planning paradigm is viewed to advocate communicative rationality, following Habermas' (1984) validity criteria of public discourse. Legitimacy, then, is a matter of communicatively rational argumentation that not only affects the legal and normative, but also the cultural-cognitive level of legitimacy (Cashmore and Wejs 2014; Forester 1993).

Agonistic planning

The proponents of agonistic planning question the goal of consensus in planning (see Bäcklund and Mäntysalo 2010; Hillier 2002, 2003; Pløger 2004). Following Mouffe (2000), this paradigm rejects the idea of having a transcendental rationality—communicative or other kind—that would provide a shared and firm basis for reasoning in planning and decision-making. Hence, the aim is to "respectfully acknowledge differences" instead of aiming at a broad consensus (Bäcklund and Mäntysalo 2010; Hillier 2002, p. 343). This opens up a pathway to legitimacy of adaptation measures that are scrutinised openly from different actors' points of view, but an overarching consensus is not considered necessary. Similar to Forester's approach to communicative planning, the planner can and should play a role in enabling the truthful expression of views by all actors having a stake (Forester 1993, p. 94 ff.). This means that in agonistic planning, the rationales for climate change adaptation might be conflicting without impeding its legitimacy.

These paradigms build on different ontological concepts, different rationalities, and diverging understandings of democracy. Hence, the paradigms' rationales and expectations, what can and should be achieved by planning, suggest different sources of legitimacy for adaptation (see Table 1 for an overview). As clear-cut as the planning paradigms appear, they do not equal planning practice. Theory and practice rather inform and further each other in a continuous exchange, than representing a perfect match (Allmendinger 2009, 18–24; Bäcklund and Mäntysalo 2010).

Table 1 Planning paradigms and the rationales and sources of legitimacy for adaptation

	Rationale for adaptation	Sources of legitimacy for adaptation
Comprehensive-rationalist planning	Provision of common good based on rational evaluation; objective scientific knowledge; political strategic guidance, but planning itself apolitical	Decisions based on objective and scientific knowledge; legal mandate of the authority; political guidance via democratically elected representatives; contribution to the common good
Incrementalism	Bounded rationality of the planner; identified benefits within the current institutional settings; negotiation with established powerful actors; action driven by events and opportunities; stepwise approach	Generation of short-term benefits; legal mandate of the authority; consideration of (individual) interests that reflect the current power structures
Communicative planning	Communicative rationality; "power of the better argument"; consensus between stakeholders can be achieved; direct and unbiased participation	Equal consideration of all interests at stake; transparent participation process; due deliberation; consensus between stakeholders
Agonistic planning	Truthful expression of actors' views; mutually respectful dealing with difference; consensus is not a norm; no transcendental rationality; direct participation	Transparent participation process; continuous communication (continuous strife); acknowledgement of (irreconcilable) differences in views and interests

Materials and methods

Case study

In general, municipalities have large autonomy from the state in Finland: municipalities hold the planning monopoly (excluding the state and private actors from the right to municipal land use planning) and have substantial tax revenues. The activities of planners are guided on the one hand by law (most importantly by the Finnish Land Use and Building Act) and on the other hand politically by the local elected representatives (Hytönen 2014). In this context, Helsinki provides an interesting case from the perspectives of both planning theory and climate change adaptation. First, previous research has demonstrated that there is no clear domination of a single planning paradigm in Helsinki, but current planning practice is rather a stratification of different and partly contradictory planning paradigms causing a situation that Bäcklund and Mäntysalo (2010) call "institutional ambiguity".[1] This offers climate change adaptation several legitimate entry points, but it can also create the conditions for conflict. Second, the city of Helsinki has taken an active role in climate change adaptation (Haapala and Järvelä 2014; Yrjölä and Viinanen 2012), and is also influenced by external processes related to adaptation, such as the national and sub-regional adaptation strategies (HSY - Helsinki Region Environmental Services Authority 2012; Marttila et al. 2005), which can generate tensions between external expectations and sources of legitimacy for adaptation within the City of Helsinki.

It is of interest here to examine how the interviewees frame climate change adaptation in Helsinki, and which organisations and groups they mention in relation to climate change adaptation. The case study consists of semi-structured interviews[2] ($n = 16$) carried out in the summer and autumn 2013, a questionnaire, and social network analysis. The interviewees were selected based on their involvement in climate change adaptation projects in Helsinki or the relevant role of their organisation identified in earlier research (Lehtonen and Luoma 2006). The interviewees included representatives of nine local administrative departments, three sub-regional authorities, two research organisations, one political representative, one consultant, and a municipality-owned public service company. The interviews were transcribed and analysed with the help of atlas.ti qualitative analysis software.

A questionnaire was sent in early 2014 to all interviewees and those actors ("actors" means organisations and groups, not individuals in this paper, see supplementary material) that were mentioned by two or more interviewees by name in relation to climate change adaptation. These selection criteria resulted in 42 recipients for the questionnaire, out of which 40 answered (i.e. a response rate of 95 %). For the following analysis, the answers to two questions were taken into account:

- "Whom did you provide information to in the last two years (1.1.2012-31.12.2013)?"
- "Whom did you seek information from in the last two years (1.1.2012-31.12.2013)?"

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[1] A concept borrowed from Hajer (2006).

[2] The interviews were conducted in Finnish. The quotations in the article have been translated by the authors.

The possible answers included a roster of 39 identified actors[3] and additionally the possibility to add further important actors. The answers were translated into networks of information flow with the help of the network visualisation and manipulation software Gephi.

Interview analysis

The sources of legitimacy, both in planning and in adaptation, are connected to the rationale underlying those actions. Rationale here is defined as the framing and description of a particular way of understanding an activity, similar to what Rein calls a core set of shared ideas on which the work of a group is based on (Rein 1983) or aspects of framing such as scope or cause and effect of an activity (Gasper 1996). As Adger et al. (2005) point out, adaptation can be framed as promoting economic well-being or as the provision of safety. Adaptation can justify strategic public intervention if the underlying rationale is the provision of the common good, or it justifies incremental adjustments, if the bounded rationality of public planners impedes the effectiveness of long-term plans. It also taps into different legitimation mechanisms, whether adaptation is judged by its compliance with the established rules or whether the effectiveness of the outcome is a decisive factor (Mees et al. 2014; Rauken et al. 2014; Wejs et al. 2013). Within each paradigm of planning, these rationales are considered internally coherent, portraying those who act, how they act and for what reasons.

Our interview analysis aimed at identifying first, the rationales for adaptation, i.e. what informs and shapes the scope and objectives of adaptation according to the interviewees, and second, the interviewees' relations to the other involved actors. For example, under the comprehensive-rationalist paradigm, the formation of the scope of adaptation depend strongly on the guidance provided by the legal framework and the political representatives (in an urban context predominantly the city council and its boards), and the knowledge provided by science. In contrast, communicative planning means to work with all interests at stake by communicative means and to agree commonly on the scope and goal (see Table 1, second column). Equally, the planner takes the role of the expert that plans for the common good (communicative-rationalist) or the role of a mediator that safeguards the fair consideration of all interests and facilitates the communication process between actors with potentially very different initial interests and backgrounds (communicative) (see also Table 2, second column).

Social network analysis

Coordination of interests, cooperation between actors, availability and use of information, and formal and informal power in practice are relational themes that are discussed in both planning literature and literature on adaptation (e.g. Burton and Mustelin 2013; Forester 1982; Healey 2006; Naess et al. 2005). These themes depict relationships between people or organisations, which are central descriptors for theories and paradigms of planning. Therefore, social network analysis (SNA) is a suitable approach for the analysis of urban planning procedures (Dempwolf and Lyles 2012; Wasserman and Faust 1994) and adaptation (e.g. Dowd et al. 2014; McAllister et al. 2013). In SNA, relations can be mapped without being bound to specific concepts or codes of conduct that are associated with planning or adaptation.

The use of SNA enables us to examine what kind of networks emerge in climate change adaptation in practice, and the properties of these networks and involved actors let us place adaptation in the context of planning paradigms. Each planning paradigm implies a set of relations between the actors. These relations can be mapped in a network with actors taking specific roles and positions. Properties of the network and the involved actors can be measured with the help of SNA and numerical parameters (see Table 2).

The flow of information as a source of power is a central descriptor for paradigms of planning (Forester 1982). A planner's perception of one's role in the planning process influences what sources of information are seen as trustworthy, which information is passed on and to whom, and what the information is used for (Forester 1982). Also Toikka (2010), researching Helsinki's environmental policy, highlights the role of networks as communication structure in policy making. Therefore, the flow of information is used as a basis for the relations between actors.

The input data for the network analysis of this study were retrieved from the questionnaire based on the answers to the questions concerning information provision and seeking. The analysis includes only relations that build on the mutual recognition. This means, organisation A considers itself as providing information to organisation B; as well as organisation B considering organisation A as an information provider. The resulting network provides therefore a very conservative interpretation of the information flow.

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[3] The discrepancy between the number of recipients and the number of actors in the roster of the questionnaire can be explained as follows: (1) the roster of the questionnaire included only "Public Works Department (PWD)", but it was sent to representatives of two sub-departments of the PWD (PWD Administration Division and PWD Construction Management); (2) the roster of questionnaire included only "Real Estate Department (RED)", but it was sent to representatives of two sub-departments of the RED (RED Premises Centre and RED Geotechnical Division); (3) the roster of questionnaire included only "Citizens" as generic group, but it was sent to two citizens' associations (Mellunmäki citizens association and Viikki citizens association). These organisations are represented as separate nodes in the network illustration. The discrepancy between the answer options in the questionnaire and the network illustration might lead to an overrepresentation of the above mentioned groups.

Table 2 Planning paradigms and related social network analysis indicators

Planning paradigm	Roles and relations of actors	Implications for actor and network parameters in SNA
Comprehensive-rationalist planning	The planning expert has a central role in generating and providing knowledge, while the roles of citizens and politicians are rather margina	Planning experts have a high outdegree (d_O) and a high betweeness centrality (C_B)
		There is a high variance of nodal degrees (some actors have many ties, while others have only few)
		The overall network density is low (Δ)
Incrementalism	The planning expert has a central role, but is exposed to varying influence of different interest groups, which might engage also in negotiations and bargaining among each other	Planning experts have a high outdegree (d_O), but the betweeness centrality (C_B) is lower than in a comprehensive-rationalist network
		The network density is higher than in a comprehensive-rationalist network (Δ)
		The nodal degrees of actors (other than planners) can vary a lot
Communicative planning	In an ideal situation, all stakeholders (including the planning experts) engage in an open and balanced dialogue, and reasoned argumentation in search for consensus	The nodal degrees of actors have a low variation
		Indegree (d_I) and outdegree are balanced (d_O)
		The network has a high density (Δ)
Agonistic planning	Stakeholders negotiate, but do not necessarily strive for full consensus. Planning experts take a central role in enabling all stakeholders to express their views	Planning experts have a high nodal degree (d_I and d_O)
		The network density is similar to the incrementalism network (Δ)

The following network and actor parameters were calculated and used for the analysis:

- Indegree $d_I(n_i)$: the number of actors actor i receives information from
- Outdegree $d_O(n_i)$: the number of actors actor i provides information to. In Fig. 1, $d_O(n_i)$ is illustrated by the node size.
- Nodal degree $d(n_i)$: the number of relations of actor i to other actors independent of whether the actor receives or provides information
- Betweenness centrality $C_B(n_i)$: assuming that communication between two actors will follow the shortest path, $C_B(n_i)$ is an indicator for the probability that information between a pair of actors is communicated via actor i. Betweenness centrality was calculated with the algorithm used by Gephi (Brandes 2001). In Fig. 1, $C_B(n_i)$ is illustrated by the node colour (from dark grey: low betweenness centrality, to light grey: high betweenness centrality)
- Network density Δ: the number of relations of a network in relation to the maximum number of relations in a network.

Results

Adaptation framing: the dominance of the comprehensive-rationalist paradigm

The interviewees provided different rationales for adaptation based on their different views of the role of scientific knowledge, the need for deliberation, the relation of politics and planning activities, and the importance of legal regulation. While for some objective scientific knowledge was imperative for adaptation action, others stressed the need for consolidation of different views on climate change and adaptation. Consequently, depending on which organisation the interviewee represented and her/his conception of adaptation, they saw themselves in the role of implementing legal and political guidance, facilitating dialogue between stakeholders or competing with others for resources and influence.

All interviewees referred to a comprehensive-rationalist view on planning and climate change adaptation. This becomes clear when the role of science and assessments, the importance of the legal framework, and the separation of politics and planning are considered. References were prominently made to the role of (natural) science and assessments that can be provided by researchers, consultants, or in-house experts. One interviewee from the City of Helsinki expressed it in the following way:

> If you are all the time at the source of the latest knowledge, then you should use it. This is important work. (City Planning Department)

Also the lawfulness of activities was stressed.

> Health and safety. This is part of the legislation, the building and land use act as well as environmental legislation. Environmental legislation is really wide.

There is the protection and the water law, waste law and all that. (City Planning Department)

There seems to be wide agreement that the roles of planning and politics are clearly separated. While politics sets the general goals for urban development, experts and planners take care of the implementation. However, some interviewees hope for and see some change in this situation.

… the participation and role of politicians, this is nowadays a little bit more relaxed this administrators versus politicians. Before it was almost as if the administrators were not even allowed to talk to politicians, which is a little bit odd situation. (Environment Centre)

…then in these strategies, environmental issues are very much on display. The Greens have a lot of power in our city council, but also in the other parties there are people with a really positive attitude towards environmental issues. […] And these [environmental goals] are partly really tough, e.g. the new emission goal. There you have to think quite a bit, how to achieve it. (Public Works Department)

Despite the domination of the comprehensive-rationalist view, there are also examples where interviewees express a more incrementalist view of planning. This is reflected in project-driven work and negotiation between different actors. Although negotiations can also be seen as part of communicative (or agonistic) planning, this would require the ambition to consider all actors with a stake in the issue. This is often not the case. Event-driven actions can also be considered as incrementalist planning, since they serve those needs that are perceived important at the very moment.

The competition for funding, attention, and influence addressed by some researchers and consultants can be understood as an expression of incrementalist planning, too.

In general, adaptation is a rather expensive activity, for example flood constructions are expensive and require investments, which are then taken from somewhere else… sure, when there was the flood in Helsinki, in Marjaniemi, or where was it, and also the market square was under water. After that things went on in a totally different "track", so to speak. But I don't know, since then maybe too much time has passed by already … (Public Works Department)

Indeed, we offer expert services when we are asked to, even if nobody asks, then we try to offer our services in seminars or by being in contact. This is our role in this case.

… our goal is to somehow influence the climate issues. That is a bit like our ideology, that we try to push things forward. (Gaia Group)

Maybe there's the same kind of trend as in research, because they [administrators] live hand-to-mouth on project money. The knowledge increases via the projects that are applied for and realised. It takes place through a kind of pulse. (Aalto University)

Only four interviewees look at climate change adaptation in a way that could be interpreted to represent a communicative planning perspective, e.g. when they actively strive for the inclusion of a wide set of stakeholders, or when they aim at providing a broad access to relevant information and enable wide participation in an informed discussion.

I think especially for the adaptation strategy the process how it was done was the most important. That was actually a real discussion. Different groups were brought together for discussion. And in these discussions comes a lot of these 'So, it can be also like this' or 'Indeed you have the same issue'. And then they could consider together what could be done in this situation. (Helsinki Region Environmental Services Authority)

Explicit expressions of the agonistic planning paradigm could not be identified. Though interviewees mentioned conflicts, solutions beyond acknowledging diverging views were not mentioned explicitly.

The network

The network in Fig. 1 illustrates the flow of information between the actors involved in climate change adaptation in Helsinki.

In Fig. 1, the Environmental Centre of Helsinki and the Helsinki Region Environmental Services Authority (HSY) are the dominant information providers (high outdegree and big node size) and at the same time the most important information brokers (high betweenness centrality, colour: light grey). The City Planning Department and Public Works Department also work as information brokers, which resembles their "traditional" role in urban planning (medium betweenness centrality, colour: medium grey). However, their role is marginal compared to HSY and the Environmental Centre.

While a fully connected actor could have up to 78 relations, the two best connected actors in this network (the Environmental Centre of Helsinki and HSY) have a degree of 33 and 32. This value drops significantly for the other actors, so that the average nodal degree is only 2.9. Eight actors are not connected to the network at all, i.e. there is no mutually agreed exchange of information. This means the network has a high variance of nodal degrees. The four
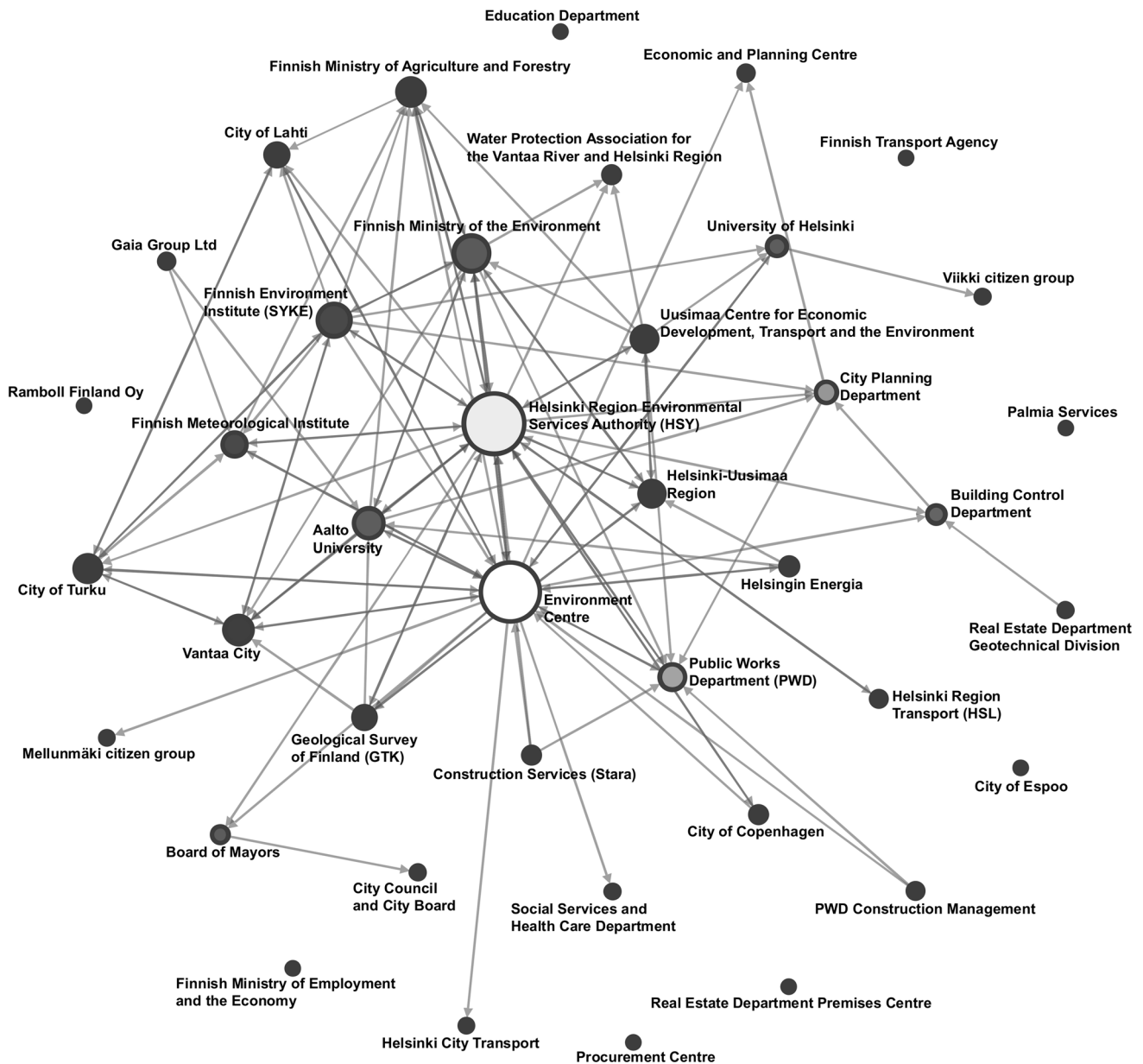
Fig. 1 Information transmission between organisations and groups for climate change adaptation in Helsinki

most central actors have a clearly higher outdegree than indegree, i.e. they mostly provide information, whereas citizen groups and political actors (Board of Mayors and City Board) are pure information receivers in this network.

Overall, the result resembles a network that could be expected in comprehensive-rationalist planning but this is not the case. When examined more closely, it can be seen the central actors, HSY and the Environmental Centre of Helsinki have a large number of reciprocal relations with other actors in the network, which points to a two-way communication. Furthermore, neither of them has the legal authority over local planning, but rather they are engaged in adaptation as a voluntary activity. The mandate for

steering and implementation lies with the technical division of the City Planning Department, as has been previously noted (Lehtonen and Luoma 2006).

Discussion and conclusions

The results of the interview analysis and social network analysis point towards an ambiguous legitimacy for climate change adaptation. There are contending understandings on what is or should be the rationale for adaptation, depending on the organisation or the involved person. Adaptation based on scientific data, expert planning and legal

prescriptions is considered legitimate following comprehensive-rationalist planning. Alternatively, a participatory process that considers different views and interests of a wide set of stakeholders is seen as source of legitimacy for climate change adaptation based on the communicative planning paradigm.

Our findings are in line with previous studies that suggest that adaptation as a new topic has fallen under the environment administration (Lonkila 2012), which means for the case of HSY and the Environmental Centre of Helsinki. While the legal framework and the influential comprehensive-rationalist planning places the City Planning Department as the central actor (Hurlimann and March 2012; Lehtonen and Luoma 2006), the network illustration shows an active involvement of a wide set of stakeholders coordinated by HSY and the Environmental Centre of Helsinki indicating a more communicative approach to adaptation, which would leave the City Planning Department mostly with the technical implementation.

This ambiguous legitimacy also leads to a contingency of the network of information flow. While the representatives of each of the organisations establish contacts and try to provide and receive information in a justified manner from their perspective, none of the organisations has control over the formation of the entire network. The network formation depends on all involved actors and builds on several and potentially contradicting paradigms. While the HSY strives for (two-way) communication with many actors, the City Planning Department might establish relations only with those actors that can provide expert knowledge useful for comprehensive-rationalist planning. Nevertheless, both the HSY and the City Planning Department are part of the same adaptation network. This network is not resting on one consistent rationale for adaptation (neither comprehensive-rationalist nor communicative), but represents a mixture of rationales that was intended by neither of the two organisations.

Ambiguous legitimacy and contingency in network formation can lead to a very high threshold for the practical implementation of adaptation, particularly if adaptation has to be legitimate in the view of several planning paradigms [e.g. (1) consensus and cooperation of a wide set of stakeholders and (2) support by comprehensive-rational assessments and scientific knowledge compete for higher priority as legitimacy sources]. The threshold increases even more when sources of legitimacy are considered incompatible, as for example when stakeholder participation questions the steering by democratically elected representatives as source of legitimacy and vice versa (Felli and Castree 2012; Hytönen 2014; Mäntysalo and Saglie 2010; Nyman and Mäntysalo 2014).

The inclusion of more actors, which is called for in both adaptation and urban planning (Adger et al. 2009; Carter et al. 2015; Harman et al. 2015; Innes and Booher 2010; Lund et al. 2012; Sager 2012) does not alleviate these challenges. In Finnish planning practices, local authorities are central actors irrespective of changes in planning culture (Hytönen 2014), and empirical studies have shown that the private sector is only poorly integrated into Finnish urban climate change adaptation (Juhola 2013). However, this does not mean, however, that planning or adaptation are necessarily public authorities' endeavours. As Tennekes et al. (2013) show, adaption to urban heat stress can be an urban planning activity as well as each individual's responsibility. Also in urban planning, the role and mandate of public authorities can be questioned from a postmodern perspective, when the dichotomy between the planner and the planned dissolves (Allmendinger 2009, 195).

Overall, the planning theoretical perspective in this study provides a view that is less centred on the sole needs of climate change adaptation. This allows for two insights regarding the success of climate change adaptation. First, climate change adaptation interacts with and aggravates inconsistencies that are already ingrained in the existing institutional context. Taking this into account, institutional change—as far as it happens—cannot be tailored to climate change solely, but has to be reconciled with the demands arising from other changes. Nevertheless, the need for adaptation can trigger changes that affect the planning practice in general. Second, while there is little doubt that the fairness of rules, the just consideration of interests, or the effectiveness of the outcome can serve as yardsticks for the legitimacy and success of adaptation, planning paradigms, or more broadly ontological concepts, rationalities and understanding of democracy can lead to very different perceptions of legitimate and successful adaptation.

This study adds to the current discussion on legitimacy of climate change adaptation. On the one hand, planning theory adds another perspective that overlaps with other aspects of legitimacy such as regulatory, normative or cultural-cognitive elements or effectiveness and efficiency. Planning paradigms also place different weights to input and output legitimacy. On the other hand, planning theory, seen as part of the given institutional context that informs both planning practice and adaptation, reduces the number of available and compatible sources of legitimacy for climate change adaptation. Therefore, it provides a narrower but in a specific urban context more targeted assessment of the legitimacy of adaptation.

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