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The impact of network management and complexity on multi-level coordination

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Abstract

In order to meet the challenges of an increasingly fragmented public sector and severe wicked problems, network structures has become an important part of contemporary public administration. Thus, managing networks is a central concern for public managers. The article focuses on networks being established in Norway in accordance with the EU Water Framework Directive. The mandatory networks are comprised with actors representing different levels of government and several policy sectors, having highly asymmetric interests, interdependencies and power-relations. Based on a comprehensive survey material, the article illuminates how the important role of network management on multi-level coordination is conditioned by complexity. Rather surprisingly, the more complex networks score better on coordination, and the most promising management strategy seems to depend upon institutional complexity. Direct and connecting strategies seems to be required in the most complex settings, while in less complex settings, indirect facilitative strategies are more effective to achieve coordination.

Key words:

Network management. Governance Networks. Coordination. Water Framework Directive.
Institutional Complexity.

INTRODUCTION

In order to meet the challenges of an increasingly fragmented public sector, as well as contemporary wicked problems, the construction of network structures and mechanisms is an important part of present-day public administration (O’Leary and Bingham 2009, Meier and O’Toole 2010). So also in water management. The EU Water Framework Directive (WFD) requires the instigation of networks containing actors representing different levels of (multi-purpose) government and several (single purpose) policy sectors - with highly asymmetric interests, interdependencies and power-relations. Thus, managing these networks is a central concern for public managers. This article illuminates the important role of managing such complex network structures, based upon a comprehensive survey-material covering Norwegian experiences.

The New Public Governance literature lays emphasis on coordination by network mechanisms as a way of dealing with institutional complexity (Peters 2010). Network complexity is, however, also assumed to restrict the outcome of governance networks (Verweij *et al.* 2013), and the need to steer the interaction within the network is therefore underscored (Sørensen and Torfing 2009). Network management (Klijn *et al.* 2010) or collaborative leadership (Ansell and Gash 2012) is emphasized for this purpose. So far, however, the literature on network management has mainly been concerned with identifying and classifying various strategies or tools – while fewer have studied how these strategies affect the *outcomes* of networks (Ansell and Gash 2008), or how the success of different types of network management strategies are influenced by different conditions (Klijn *et al.* 2010), as institutional complexity. In this article we aim to meet some of these shortcomings pointed to in the literature (Provan and Milward 2001; Kenis and Provan 2009; McGuire and Agranoff 2011), by studying one important aspect of network management outcomes; *achieved coordination*. After mapping the achieved coordination as this is perceived by the network actors and the network management strategies in use, we ask:

- How does institutional complexity of the network affect the outcome, understood as perceived coordination?
- How do different network management strategies influence the relationship between complexity and coordination? Do more complex networks require the application of more direct network management strategies than less complex settings?

Our study contributes to the multi-level governance literature (Bache and Flinders 2004; Marks and Hooghe 2004; Peters and Pierre 2004), as it analyses the effects of networks where local, regional and national authorities participate – ideally as equal parts. However, they are formally placed in a traditional hierarchical relationship, which might influence their interplay. Moreover, the study contributes to the network management literature, as it nuances the earlier findings that network management matters (Klijn *et al.* 2008; 2010), by studying how the effects of management strategies interact with institutional complexity. In addition, Norway has traditionally been one of the most fragmented water management systems in Europe (Hedin *et al.* 2007), and therefore represents a critical case of the EU WFD-implementation. Due to the Agreement on the European Economic Area (EEA), Norway is obliged to implement the WFD, even if it is not an EU-member. Due to strong Norwegian tradition of highly autonomous local and regional government, the formal and mandatory

regional networks represent a great variety as to size and complexity, thus representing a good point of departure for studying the effects of the variation.

THEORETICAL FRAMEWORK: MULTI-LEVEL GOVERNANCE, COORDINATION AND NETWORK MANAGEMENT

Multi-level governance and governance networks

Since the 1980ies, we have witnessed an emergent need for coordination in more complex, fragmented political processes due to increased fragmentation of public affairs (Christensen and Lægreid 2011). In order to meet the challenges, the construction of network structures and mechanisms is an important part of present-day public administration (Meier and O'Toole 2010). One of the dimensions of complexity is the increasingly fluid negotiated and contextually defined relationship among institutions at different tiers of government (Peters and Pierre 2004:75). Hierarchical systems have been complemented by complex intergovernmental relations, reflecting a more egalitarian and diffuse relationship between national and sub-national authorities (Bache and Flinders 2004; Marks and Hooghe 2004). The trend is observed in the Nordic as well as in other Western European countries (Bogason 1998; Kelly 2006). National governments now utilise a broader variety of mechanisms to exercise power, and is increasingly reliant upon network-oriented coordination mechanisms as information, negotiation, deliberation, agreements and compliance (Bouckaert *et al.* 2010). Initiating multi-level governance networks has become a rather common steering and coordination mechanism. Governance networks are often defined as a relatively stable, horizontal articulation of interdependent, but operationally autonomous actors, who interact through negotiations, which takes place within a regulative and normative framework, that is self-regulating within limits set by external agencies, and which contributes to the production of public purpose (Sørensen and Torfing 2007, p. 9). One example is the newly established networks being responsible for implementing the EUs WFD.

Coordination in a multi-level governance context– the concept and types of coordination

Coordination is often the main argument for establishing multi-level governance network. So also in EUs WFD, where the aim is to ensure coordinated effort to reduce different pressures on water and to achieve the ambitious aim of ecological good status on all water (European Union 2000; Nielsen *et al.* 2013). However, measuring coordination is difficult, and few quantitative studies have tried. We are here measuring coordination as *perceived coordination* by the actors involved, more precise – the members of the River Basin Districts Water Boards.

Coordination can be defined as “(t)he instruments and mechanisms that aim to enhance the voluntary or forced alignment of tasks and effort of organizations” (Bouckaert *et al.* 2010, p. 16). Complex problems require both multi-level or vertical coordination, denoting coordination by a higher level authority of lower level actors’ actions (Bouckaert *et al.* 2010, p. 24) as well as horizontal (or cross-sector) coordination of public sector agencies at the same level of government, as well as private actors (Hanssen *et al.* 2013, p. 3). We are here interested in both.

In a situation of institutional complexity, one is often left with a *network mode of coordination* (van Bueren *et al.* 2003, Scharpf 1999, p. 20), as a hierarchical mode often will fall short due to the

autonomous positions of stakeholders, the uncertainties regarding causes and effects and the contested nature of the policy. Nevertheless, when talking about public authorities a network mode of coordination always operate in the shadow of hierarchy. The coordination effects can thus be restricted, or enhanced, by the interplay with a hierarchical mode. In order to measure the *effects* of a network mode of coordination, we have developed a cumulative “ladder of coordination”, each rung increases the level of coordination achieved (Hanssen *et al.* 2013; Arnstein 1969; Keast *et al.* 2007).

(FIGURE 1)

The lowest level illustrates a situation characterized by *mediation* - mutual exchange of information and knowledge. Actual coordination is not taking place before the second step, discerned by what we call *first order coordination*. Here, the bridging of different (professional) discourses and emergence of a shared language will be of special interest in our case. Especially deliberative theories are emphasizing this type of coordination (Habermas 1996). At the third step, *second order coordination*, the actors adjust their action to create synergies and avoid externalities and overlap, (Pedersen *et al.* 2011). This is denoted as “coordination” in Keast (*et al.* 2007), and ‘institutional interplay’ in water management literature – describing how the effectiveness of specific institutions is affected by other potentially intersecting institutional arrangements (Nielsen *et al.* 2013:438, Moss 2004). These adjustments can be a result of negotiated agreements, or a result of deliberation. It is, however, not before the fourth step that we find *cooperation* characterized by joint action and joint measures. This is often denoted collaboration in the literature (Keast *et al.* 2007). A topical form is partnerships, involving joint decision making and production between autonomous actors (Sullivan and Skelcher 2002). When handling wicked problems in a situation of institutional fragmentation, there is a need for institutional solutions that are able to reach *high levels* of coordination. Hence, the question of outcome as perceived *level* of coordination is relevant.

Institutional complexity, network management and coordination

Network governance is understood as a way of dealing with complexity. However, the *coordination capacity* of networks can be negatively related to the *complexity* of the network. The notion of complexity refers to the number of actors in the network which represent different interests, problem perceptions and solutions (Verweij *et al.* 2013). In our case, we are studying one policy area with mandatory governance networks between different public authorities. The networks are formal and permanent, but vary in size, complexity and which actor groups that dominates. The most complex water governance networks are comprised of actors not previously used to cooperate, which might add to the complexity, as experiences of cooperation in the past can foster trust and reduce transaction costs of cooperation (Feiock 2007).

“Network” is understood as structures involving multiple nodes – agencies and organizations – with multiple linkages, ordinarily working on cross-boundary collaborative initiatives (McGuire and Agranoff 2011, p. 266). There seems to be a consensus in the literature that *meta-governance* is

necessary to achieve coordinated action in networks (Koppenjan and Klijn 2004; Sørensen and Torfing 2009; Klijn *et al.* 2010). Meta governance involves providing direction to essentially self-regulating governance networks without reverting to hierarchical command-and-control. It involves attempts of politicians, administrators or others to construct, structure and influence the game (Sørensen and Torfing 2005, p. 202). We use a managerial perspective on meta governance, called *network management*, defined as “the deliberative attempt to govern processes in networks” (Klijn *et al.* 2010, p. 1065), or facilitating leadership (Ansell and Gash 2008). Many argue that such leadership requires other skills and strategies than ordinary leadership, in the absence of clear organizational context, fewer hierarchies and greater differences in perceptions of problems (Klijn *et al.* 2008; Steijn *et al.* 2011). It requires connecting actors, facilitating interaction and productive group dynamic, mobilize the participants to move the collaboration forward, extend the scope of the process, and ability to formulate credible and convincing decisions that are acceptable for all (Klijn *et al.* 2008; Koppenjan and Klijn 2004; Lasker and Weiss 2001; Ryan 2001; Vangen and Huxham 2003).

The literature has for long been occupied with *identifying* the various ways in which this can be achieved, and to classify tools, strategies or roles (Sørensen and Torfing 2009). Surprisingly few have aimed at exploring *the effects* of different types of network management. Klijn *et al.* (2010) represents an exception, examining the links between different process management strategies and outcomes. They find that network management matters, as the number of managerial strategies, and thus the intensity of network management is an important factor for achieving successful outcomes (Klijn *et al.* 2010, pp. 1076). They also find evidence that the strategy of *connecting* is the most promising. The ability to identify which actors are crucial, and to activate and connect these actors, is important.

The literature on collaborative leadership make a distinction between three facilitating roles of collaborative leaders, the roles of convener (or steward), mediator and catalyst (Ansell and Gash 2012; 2008; Susskind and Cruickshank 1987). *Conveners* facilitate collaboration by convening and safeguarding collaboration and maintain its integrity. *Mediators* facilitate collaboration by managing conflict and arbitrating exchange between stakeholders. *Catalysts* facilitate collaboration by helping to identify and realize value-creating opportunities. According to Ansell and Gash (2012, pp. 18-19) “facilitative leadership will typically require leaders to play all three of these roles”. However, networks that encompass public actors, includes another dimension of complexity, as network managers have to deal with organizations that have both *political and administrative* leaders. This requires a special intuition for when to anchor decisions on the administrative level and on the political level. We therefore add a fourth role; the *bridge-builder*. A bridge-builder knows how to maneuver in and between political-administrative authority levels, knowing how, when and how much political anchorage and administrative anchorage that is necessary to ensure accountability and legitimacy (Holmen and Hanssen 2013). This role covers important aspects of the strategy of connecting identified by Klijn *et al.* (2010) and the need for democratic anchorage (Sørensen and Torfing 2005; Peters 2010).

In line with Ansell and Gash (2013), we expect network managers to play all these roles, - but to a varying degree. This article analyses how the network management strategies applied varies across degrees of institutional complexity. Both Klijn *et al.* (2010) and Ansell and Gash (2012) are underscoring the demand for studies aiming at exploring how different mixtures of roles or strategies are functioning under different conditions. As the number of actors increase and the network

connections between the actors weakens, we believe successful coordination requires more active strategies to achieve higher levels of coordination. In line with Klijn *et al.* (2010), we emphasize the need for more direct, or connecting, strategies, or the role of *mediator* or *bridge-builder*.

OUR CASE: THE COORDINATION CHALLENGES OF WATER MANAGEMENT IN NORWAY

Water management represents a good case for studying multilevel coordination, as responsibility and instruments are distributed to public authorities on several levels of government and to various sectors of government.

The EU Water Framework Directive (WFD) addresses the problems of a fragmented public sector. The ultimate aim is to achieve good environmental status in all of Europe's waters, as well as distributing the relative advantages and costs as equitably as possible (EU 2000). In order to achieve comprehensive water management, the WFD introduces catchment area as the functional unit (Hammer *et al.* 2011). The idea is that water planning is to be integrated across all water uses as well as integrated with other related policy-sectors (Nielsen *et al.* 2013). While most countries have adapted the administrative structure of river basin management to the existing administrative structures (Nielsen *et al.* 2013), Norway has designed *new units* – 11 River Basin Districts (RBD) and 104 Sub-Districts (SB), cutting across existing municipal (429), County (19) and regional state administrative borders. Each River Basin District is guided by a cross-sector, cross-level *RBD-Water Board* comprising all affected authorities at local (municipalities), regional (county municipalities) and national level (regional state authorities). The participating regional state authorities are first and foremost the County Governor, The Directorate for Fishery, The Norwegian Water Resources and Energy Directorate, the Norwegian Food Security Authority and the Norwegian Public Roads Administration. The RBD-Water Boards are formal, permanent networks and can be characterized as *enforced*, as they have not emerged from below, but are a compulsory part of the implementation of the WFD in Norway. There is a large conflict potential within the networks, as they comprise authorities representing interests that *use* water, thereby representing pressure on water, as well as authorities responsible for the *protection* of water.

The most important role of the RBD-Boards are to be in charge of *formulating mandatory Management-plans* which, by consensus, identify all environmental threats and risks to water bodies within the catchment area, formulate a joint plan for goal-achievement, and give an overview of relevant measures. One of the Counties in each River Basin District is assigned a role as the *network manager* (called coordinators), leading the RBD-Water Board. The plan-process follows the EU's 6-year planning schedule. In this process, Sub-Districts (SB), with their *SD-Boards*, are important arenas giving input, each of them being managed by full/half-time network managers (called project leaders). Private actor interests are included in *advisory groups*. The organizational structure is presented below.

(FIGURE 2)

The article draws attention to *the performance of the network managers; the coordinators* of the River Basin Districts and *project-leaders* of the Sub Districts, and discusses how their performance – as well as institutional complexity of the network - affects the outcome, understood as *perceived achieved coordination*. The network manager role seems complex and riddled with pitfalls, as they are supposed to coordinate the efforts of municipalities and different regionalized single-purpose state agencies, over which they have no binding authority. Many of these public authorities operate in regions with different geographical size than the Counties. Some RBDs consist of several Counties, which also need to be coordinated. Hence, operating as network managers in these networks is highly challenging.

DATA

The data being analyzed stems from two national surveys, conducted in the research project “*Water Pollution Abatement in a system of Multi-level Governance: A study of Norway's implementation of EUs Water Framework Directive*” financed by the Norwegian Research Council. The first was sent to all members of the RBD-Water Boards in the 11 River Basin Districts in Norway (digital survey distributed by e-mail in 2013). The actors represented are municipalities, county municipalities and regional offices of national sectors authorities representing the interests of agriculture, hydropower, fish-farming, environmental authorities, road and traffic authorities etc. The size of the Water Boards varies a lot, from 12 to about 270 participants. The total number of respondents in the survey was 733, 301 answered, giving a response rate of 41. All River Basin Districts are represented in our sample, and there is only small variation in the response rate among districts. The response rate varies slightly with affiliation, as the municipalities are somewhat underrepresented (74% of the boards and 64% of the sample) and the state authorities somewhat overrepresented (19% of the boards and 24% in our sample). Even though this bias is rather small, we will control for the respondents affiliation in our analysis.

We conducted a second survey to the coordinators of the 11 River Basin Districts and the project managers of the Sub-Districts. Many of the project managers were responsible for several Sub-Districts, and thus the total respondents in the survey to coordinators and project managers were 71. 53 have answered, giving a response rate of 75. 10 of the 11 district coordinators responded and 43 project managers from 10 of the 11 water districts responded.

As our indicators of coordination and network management are indexes constructed from the respondents’ answers to single items, we now continue with the presentation of our findings regarding achieved coordination and use of network management strategies, before we turn to the operationalization of the variables in our empirical model.

FINDINGS: COORDINATION ACHIEVEMENTS AND NETWORK MANAGEMENT STRATEGIES

Coordination achievements of the WFD-work

One of the main objectives of the new networked structure is coordination of the efforts of different governmental levels and sector-authorities. As presented earlier, network outcome is measured by

the members' *perception of achieved coordination*. In our survey, the members were asked if the WDF-work in general had contributed to different coordination-results, categorized as the different "steps" of the coordination-ladder. In figure 3 the findings are presented, showing the percentages answering either "To a great extent" or "To some extent".

(FIGURE 3)

The figure reveals interesting tendencies. Firstly, the perceived coordination achievements decrease as we reach higher rung on the ladder. Almost 60 percent reports that the WFD work have contributed to the lowest level of coordination; information and knowledge sharing among the actors. This is an important achievement, as knowledge transfer is a prerequisite to achieve higher level of coordination. As much as 55 percent report achievements of coordinating different actors' understandings and world views, by discussions and deliberative processes. This is also an important achievement, as different world views often will result in lack of coordination and cooperation. Less participants report about achieving the two highest step of coordination. The third step is that the different actors adjust their behavior to avoid externalities or to gain synergies. Here 40 percent report that the WDF-work has contributed to this. Almost half of the participants do report that the WDF-work has contributed to the highest step of coordination, which is cooperation about joint goals and measures. Summing up, the figure shows a tendency that the WFD-work in Norway primary is achieving relatively basic forms of coordination, having potential for reaching higher levels.

Network management strategies

We are, furthermore, interested in the performance of the network managers of the River Basin Districts and Sub Districts. The four main roles of collaborative leaders: convener, mediator, catalyst and bridge-builder are operationalized in different sub-strategies. The convener is characterized by ensuring the information flow, producing documents, as well as role clarification and compliance with obligations. The catalyst is characterized by motivation, raising awareness and ensuring ownership, and the mediator by being a broker and facilitate discussion. The bridge-builder is operationalized by linking aims at different levels and ensuring political anchorage. We asked the network managers to what extent they apply these sub-strategies. Table 1 shows the results for the coordinators and project managers respectively, and also how this is perceived by the members of the RBD-Water boards.

(TABLE 1)

In order to compare network strategies, the figures in table 1 should be compared between strategies within each respondent group, not between groups, as the board members tend to be more modest in their evaluation.

The results presented in table 1 show that none of the different collaborative leadership roles are dominant across districts and sub-districts. On average, the District coordinators and the Sub-District project managers are emphasizing all four roles, as every sub-strategy gets a mean score above 3 (the theoretical mean), and sub-strategies representing all four roles are ranked among the top six. The District coordinators lay, however, most emphasis of the *convener* role, as the score of three of five sub-strategies are among the top five. There are no such tendencies in the project managers' response. From the perspective of the Water Board Members, the coordinators taking a role of *bridge-builder* is most visible, as two of three sub-strategies scores among the top three. All three groups agree that the least important sub-strategy is broker. The role of *mediator* does not seem to be dominant.

These average scores hide some variation among the District Coordinators. When focusing on the sub-strategies that they report to apply to *a large extent* (see table A1 in appendix), some interesting differences appear. While most coordinators emphasize several of the sub-strategies characterizing a *convener*, the use of sub-strategies describing the three other roles varies. The *bridge-building* strategies get highest score among three coordinators, the *mediator* strategies among one, while none of the coordinators rank the *catalyst* strategies at top. The convener sub-strategies are dominant for four coordinators. The responses from the three remaining District coordinators do not indicate any priority between different leadership roles: The coordinators emphasize either many different sub-strategies (two regions) or a few sub-strategies representing different roles (one region). These results support the findings of Ansell and Gash (2008) that different collaborative leadership roles are combined. How they are combined varies, though, as the dominant role or role combination varies among the District Coordinators.

Considering the Water Board members assessment more closely, there is no tendency that some board members rank one manager strategy high, while others rank a different strategy high. (Indexes measuring mean score of each management role correlates strongly, and a factor analysis results in one single factor). Thus, from the perspective of the Board members, there are no tendency of regional variation in which role that is dominant.

EMPIRICAL MODEL

We are also interested in how institutional complexity affects the perceived outcome of the networks, and furthermore, how different network management strategies influence this relation between complexity and coordination.

When measuring *outcome in form of perceived coordination*, we apply the "ladder of coordination" (see figure 3). We have constructed an index variable taking account for both the individual Water Board members' assessment of the extent coordination is achieved and the rung on the coordination ladder. The assessment of coordination at rung one is given the weight 1, the assessment of rung two the weight 2, of rung three the weight 3 and of rung four the weight 4. The index is then transformed back to the original scale with a minimum score of 1 ("not at all") and a maximum of 5 ("to a large extent"). We will argue that coordinated action (rung 3) and joint measures (rung 4) is required, in order to reach the WFD-goal of good water quality. Therefore, we choose to use a measure that

takes account of not only the board members assessment of the extent coordination is achieved, but also the level of coordination.

We measure *institutional complexity* by a set of dummy variables indicating whether the water region is comprised by several counties (complex region), two counties (medium complex region) or mainly one county (least complex region). The number of counties indicates variation in number of participants (number of municipalities, county municipalities and state agencies) involved in the region. The complex regions, and to a lesser degree the medium complex regions, are typically comprised by several parallel hierarchical structures (silos).

Our second question asks how network management strategies influence the relationship between complexity and coordination, i.e. the interaction effect of management strategies and complexity. Regarding *network management strategies*, we have identified the dominant network management role of the RBD-coordinator. Four dummies are constructed, distinguishing between the 11 regions according to whether the coordinator reports a dominant network management strategy of convener, mediator or bridge-builder, or no dominant strategy. When testing *the interaction effect* of institutional complexity and network management strategies, we use a set of dummy-variables distinguishing between the regions according to the combination of the coordinators dominant management strategy and institutional complexity.

In order to test for the effect of *network management intensity*, pointed to in several previous studies (Klijn *et al.* 2010; Steijn *et al.* 2011, Agranoff and McGuire 2001), we include a variable measuring how this is perceived by the RBD-water board members. The variable is constructed as the mean score of the members' assessment of the coordinators performance on the sub-strategies reported in table 1. (A valid answer on at least 5 sub-strategies is required). As indicated in table A2 (in appendix) there is quite a variation in the members' evaluation of the District Coordinators performance. While some members perceive the coordinator as an active network manager, others perceive the coordinator as being rather passive.

We introduce the following *control variables*, potentially affecting the Water Board members' perception of achieved coordination.

- *Extent of participation*, the number of arenas and working groups the board member attain. (eight potential arenas, see figure 2): District board meeting, the executive meeting, political steering group, administrative steering group, Sub-District Board meeting, project groups, sector groups and meeting with the advisory group of stakeholders).
- *Nodality*, whether the respondent is member of the executive meeting of the water board or not.
- *Institutional affiliation* (municipality, county, regional state, other).

The descriptive statistics of the variables are presented in table A2 (appendix).

FINDINGS

How institutional complexity influence coordination?

So, how does the institutional complexity of the network influence coordination, as this is assessed by the members? Table 2 below presents results from a regression analysis where the perceived level of coordination in the most complex and medium complex regions is compared with the perceived level of coordination in the least complex regions (reference category). Network management intensity, and the members extent of participation, nodality and institutional affiliation (representing a state agency is the reference category) are included as control variables in the analysis.

(TABLE 2)

Rather surprisingly, the most and the medium complex regions are most successful and the less complex regions least successful, according to the board members, and the differences are rather substantial. On average the medium and high complex regions score 0,33/0,31 higher on the coordination index than the least complex regions (the reference category), both coefficients being statistically significant. This is contrary to what we expected, as we did expect the coordination efforts to be more successful in regions comprised by fewer actors and more dense network relations. Furthermore, the board members' perceptions of coordination outcomes are strongly linked with their perceptions of network management intensity. A one unit increase in the intensity index does on average lead to a 0,47 increase in the coordination index. As expected, the more active the members believe the district coordinator to be, the higher level of coordination they believe is achieved.

Nodality is negatively related to perceived outcome. The members of the executive meeting believe that less coordination is achieved than those members not attaining this meeting. Participation is positively – but not statistically significantly - related to perceived outcome. Affiliation does not seem to matter much to the board members perception of coordination. The respondents representing neither municipalities, counties nor state, are most satisfied with the achieved coordination, but they are too few to mention.

Is the influence of institutional complexity on coordination conditioned by network management strategy?

In order to explore this rather surprising result further, we have identified the coordinators' dominant network management strategies, and investigate how the combination of institutional complexity and network management profile is linked to the members perceived coordination outcome.

Table 3 reports the scores on the coordination index for the different existing combinations of institutional complexity and network management profile. The combination of low institutional complexity and no profile is the reference category. We have controlled for network management intensity, participation, nodality and affiliation (The estimated coefficients for these control variables are very similar to those reported in table 2, and are therefore not reported here).

(TABLE 3)

As the empirical combination of institutional complexity and management profile is limited, we are not able to test the complete interactive pattern between these two variables. In table 3, the low complex regions with no management profile is the reference category. The regression coefficients show the differences in achieved coordination between this and each of the other combinations of complexity and management profiles. Three of these combinations receives higher scores than the other, and significant higher than the reference category. In the most complex regions, the *bridge-builder* seems to be a promising strategy, while the *convener* seems to be promising in both medium and low complex regions. In these low and medium complex regions, the more direct manager roles as bridge-builder and mediator are not that promising. The three low complex regions where the coordinator does not choose a leadership profile (the reference category) are performing the worse. Thus, it seems to be important whether the coordinator *has* a dominant strategy or not. The importance of which strategy he or she choose, seems to depend on institutional complexity. Thus, we do not find any support for an expectation that the direct roles of bridge-builder and mediator are more effective than the indirect roles of convener and catalyst (see Klijin *et al.* 2010). This seems to depend on how complex the network is.

The differences in emphasis on the bridge-building strategies are rather striking (see Table A2 in appendix). The coordinators in both complex regions give all three bridge-building sub-strategies top score. In the four most “successful” low- and medium complex regions, no one or only one get top score. In complex institutional settings where new network relations have to be build, a bridge-building role seems promising. In less complex settings and in a situation of dense network relations, a convener role seems promising. These findings, we will return to in the following discussion.

DISCUSSION AND CONCLUSION

We believe our findings have implications for our understanding of the potential for managing of governance networks. In the study, network output has been measured as perceived achieved coordination. Coordination is one aim of the networks, but only as an instrument to achieve the ultimate aim, which is to improve the ecological status of water. It is important to note that this study says nothing about the latter. However, coordinating the effort of different sector authorities is considered to be necessary to improve the ecological status of water. Based on the members’ perception reported in a broad survey, we found that the networks primary have achieved relatively basic forms of coordination (information distribution, developing of mutual understandings), having an unreleased potential for reaching higher levels (adjust behavior in own sector and developing joint measures). Hence, the coordination can also be characterized as “intermittent coordination” (Mandell and Steelman 2003, O’Leary *et al.* 2009), denoting a situation where interaction in the network is relatively low, commitment is at arm’s length and resource sharing is limited in scope.

Our first question was how the *institutional complexity* of the network affects the outcome, understood as perceived coordination. Surprisingly, the more complex networks score better on

coordination. Hence, our findings do not support the general assumption of a negative relation between network complexity and outcome. Our study indicates that the least complex regions had achieved less coordination than the medium and most complex regions.

When it comes to *network management*, our study supports the established knowledge that network management does matter. Network management intensity, implying that the coordinators are active, visible and make use of many strategies, is important for achieved coordination. This is in accordance with Klijn *et al.* (2010), finding positive effect of the application of intensive network management strategies, and others finding that a range of different strategies matter (Steijn *et al.* 2011, p. 1239, Agranoff and McGuire 2001; Mandell 2001, Vangen and Huxam 2003; Crosby and Bryson 2005). Our findings support Ansell and Gash (2008) argument that effective leadership of such networks is likely to be time-, resource- and skill- intensive. The human elements in collaboration, which has been less focused in the literature (O’Leary *et al.* 2009:7), seems to be relevant here: A coordinator that is active and use many different strategies, but at the same time has a clear profile or give priority to one leadership role, is the most successful.

Here we end up with our second question, *how different network management strategies influence the relationship between complexity and coordination?* We find clear indications that what is the most promising network management strategy depends upon institutional complexity. In the two most institutionally complex regions the coordinators have quite a success with playing the role of *bridge-builder*. In the medium and low complex regions, the coordinators playing a *convener* role have most success. It is interesting to note that network managers have to emphasize different aspects or strategies, depending upon the institutional complexity, to achieve coordination outcome. Thus, it is no “one size – fits all”-solution. In networks which at the same time are highly complex and new, the network manager role of bridge-builder is promising. This can be related both to the novelty and complexity of the network, as the role has a strong multi-level governance-dimension. Our definition of the bridge-builder role includes linking aims at different governmental levels and the importance of ensuring political anchorage. The ability to know which decision to be anchored in the participating organizations is probably particularly important in complex situation, in order to avoid veto-points. Networks crossing several counties is breaking the normal division of responsibilities and authority – which probably also makes such anchorage necessary. The coordinators of the complex River Basin Districts have to *bridge* many political-administrative regional systems. Coordinators in the least complex regions function *within* the existing political-administrative system, and can utilize existing network relations. Here we find that the more indirect role of convener is more promising, as the participating actors know each other and are used to cooperate in regional planning processes. The interests and positions are probably well know, and thus also the potential conflicts. Thus, there are reasons to believe that the need for coordination is highly recognized by the participating public actors.

As mentioned, Klijn *et al.* (2010) found that the direct management strategy of connecting was most promising, and “connectivity” has been argued to be the most important capability for public organizations, in order to create and leverage participation in network-designed and -delivered solutions (McGuire and Agranoff 2011). Other studies have emphasized similar characteristics, described as “bridge-building strategy” (Holmen and Hanssen 2013) viewing multiorganizational collaboration as essential (McGuire 2009). A bridge-builder work in positions between two or more

systems, and have deep understandings of the mechanisms and “logic of appropriateness” (Olsen 2007) in each. They deal with actors on both side of the boundary and specialize in negotiating the interaction between them (Van Hulst *et al.* 2012). In the study of McGuire (2009:90-91) the capability to work with multiple jurisdictional and organizational partners, thus knowing the relevant “logics of appropriateness”, was highlighted. Our study contributes to this strand of literature, as our findings indicate that what is required by the network manager depends on characteristics of the network. In low complex and long lasting networks, an indirect role of convener might be effective in promoting coordination. A bridge-building capacity seems most important when managing complex networks.

Thus, our study not only supports the overwhelming consensus that the complexity of network interaction makes network management of utter importance - especially for connecting the variety of actors at different policy levels (Koppenjan and Klijn 2004; Sørensen and Torfing 2007; 2009; Klijn *et al.* 2010). By linking network management strategies to institutional characteristics of the network, our study indicates that complexity affect the success of different network management strategies. However, the study is limited to 11 networks of water management in Norway, and the actual combinations of complexity and management strategies are few. Our findings must therefore be interpreted with caution. General conclusions across policy fields or countries are hard to draw, based on our findings. Still, the policy area of water management is broad and cuts across traditional sectors, and encompasses the classical growth/conservation cleavage. Therefore, the study has potentially identified conditions and relations of general relevance for similar environmental and multi-level governance networks, in Norway and elsewhere. The findings must also be interpreted with caution as the output of networks is measured by the actors’ *perception of* achieved coordination, and perceptions might diverge from reality. Further studies are needed in order to test the relations indicated in this study, when the networks have matured and it is possible to map real coordination as a result of the network activities. Nevertheless, this study has been able to map the perception of a wide range of different actors in an early phase, which might form basis for longitudinal studies of networks.

Having the reservations of generalizability in mind, it still is interesting to discuss the broader implications of our findings. *First and foremost*, the findings illustrate the challenges related to the new roles for public authorities, increasingly striving for coordinating their effort by attending, managing or meta governing networks. In our case, the coordinators represent the elected regional level (County-municipalities), a level which has been delegated new coordination roles in order to reach national political aims in Norway. This role, however, can also be interpreted as a decentralization of dilemmas from national to regional level. The governance networks in this study are meant to function as coordinating arenas, while the actual measures (and change of behavior) are meant to happen in the different sector authorities. Thus, the networks can be characterized as “shared governance form” (Kenis and Provan 2009: 446), as the coordinating County municipality has no instruction authority, whatsoever, over the participants.

The fact that the governance networks are “enforced”, being formal and mandatory, seems to complicate the task further. The history of recognizing the needs for coordinating the efforts of the members found in voluntary networks, are often lacking in mandatory networks (Van Raaij 2006). Thus, the anchoring of the work in all participating institution are crucial for such mandatory “shared governance” networks, at least in the early stage. As these participants are linked to different

hierarchical structures and responsible for different territories, the anchorage of the work requires enormous efforts, particularly in the most complex regions. As McGuire (2009:90) also emphasizes the professionals acting like coordinators are seldom trained in interorganizational relationships or collaboration between public agencies. Our study show how essential this competence is. As the successful network management strategies vary due to institutional complexity, the coordinators need knowledge on what strategy that fits the specific network, as it is embedded in many institutional settings and organizational cultures. They therefore need to develop a competence denoted “transitory social capital” (McGuire 2009: 90) or “interagency collaborative capacity” (Bardach 1998:20).

Secondly, one of the main arguments for establishing governance networks is that deliberation will take place between equal parts, resulting in the best possible solution. Our finding of the importance of the bridge-builder role indicates that this is an ideal-situation. In reality, the bridge-builder is needed to work strategically towards all partners, constantly working with anchoring suggestions and solutions, and knowing how to handle the different patrons from national, regional and local level. This is in accordance with findings in the studies of Vangen and Huxam (2003) and Crosby and Bryson (2005), showing that the network manager constantly work for finding the right balance between how the participants in network approach each other in negotiations within the network, and their commitments to their patrons. This implies a high risk of ending up with the solution that is the lowest common denominator, and that the chances for real deliberations are low. Thus, the question is if there is a limit for complexity, and when is an introduction of network mode of governance worth the effort? Would traditional hierarchical mode of coordination be more effective for ensuring good ecological status of water, by coordinating different public authorities through the use of command-and control?

However, there is an even more severe consequence. When the “shadow of hierarchy” is so dark and overwhelming, governance networks risk functioning as parallel systems – concealing the real power-structures, thus, reducing the accountability of public authorities. Hence, this study also contribute to the literature of the challenges of governance networks related to loss of public accountability (O’Leary and Bingham 2009, O’Leary et al. 2009) and “re-hierarchization” of governance networks (Davies 2011), describing the merging of the governance modes of network and hierarchy. Thereby, the advantages of the network mode of governance might disappear, and the outcome of the governance network might be reduced to more blurred lines of accountability.

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APPENDIX

(Table A1)

(Table A2)