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To cite this article: Jon Naustdalslid (2015) Multi-level water governance – the case of the Morsa River Basin in Norway, Journal of Environmental Planning and Management, 58:5, 913-931, DOI: [10.1080/09640568.2014.899895](https://doi.org/10.1080/09640568.2014.899895)

To link to this article: <https://doi.org/10.1080/09640568.2014.899895>



Published online: 14 Apr 2014.



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Multi-level water governance – the case of the Morsa River Basin in Norway

Jon Naustdalslid*

Norwegian Institute for Urban and Regional Research, Gaustadalléen 21 Oslo, N-0349 Norway

(Received 19 March 2013; final version received 27 February 2014)

Management of fresh water resources meets a range of often conflicting interests. Waterways usually run across political and administrative borders and hence make management difficult and collective action politically challenging. In order to meet these challenges, multi-level bioregional approaches to water management have been called for. Such an approach is institutionalised in the EU's Water Framework Directive (WFD). This paper presents the experiences of the Morsa water sub-district in southern Norway, a pilot for implementing the WFD. The paper discusses Morsa in the light of four principles for multi-level water governance: management on a bioregional scale; polycentric governance; public participation; and an experimental approach to water governance. Contrary to widely held assumptions that collective action in polycentric networks will be difficult because actors will follow their own narrow interests, the findings demonstrate how this is not an absolute truth, and how social action cannot be fully explained by rational action theories. The analysis concludes that the relative success of Morsa relates to a complex of factors, including openness of practices and active involvement of key actors, strong but including leadership, and a knowledge based 'hybrid' type of multi-level network combining horizontal and vertical network governance.

Keywords: water management; multi-level governance; Water Framework Directive; local government; leadership

1. Introduction and background

The management of freshwater resources confronts managers and politicians with a multitude of complex and intertwined challenges. Water is a common good. However, at the same time, water is also exploited for a wide range of different and often conflicting usages that may be a threat to the common good (Global Water Partnership Technical Advisory Committee 2000; Martinez and Hofwegen 2006). Water management takes place in the intersection between nature and society and has biological and biochemical as well as human and physical components

This interwoven complexity of water presents water management with fundamental challenges such as sector coordination, harmonisation of conflicting interests and territorial border-setting. Such challenges are not always met in adequate ways (Global Water Partnership Technical Advisory Committee 2000; Martinez and Hofwegen 2006). Water management has been accused of being "poorly integrated with other activities" (Barrow 2006, 242) and "notoriously compartmentalized into specialties devoted to different aspects of water management" (Burton and May 2004, 36). It has been maintained that traditional hierarchical and sector-oriented government is poorly suited

*Email: jon.naustdalslid@nibr.no

to manage water issues (Moss and Newig 2010). Since water issues are ecologically linked in space and usually cut across administrative and political borders, such issues call for coordination, not only across administrative levels and sectors, but also between local authorities at the same level (Pahl-Wostl, Gupta, and Petry 2008). It is therefore claimed that water management should build on an integrated, flexible and ecosystems-oriented approach to governance based on network-oriented models of governance rather than hierarchy (Global Water Partnership Technical Advisory Committee 2000; Kallis and Butler 2001; Armitage 2008; Pahl-Wostl, Gupta, and Petry 2008; Huitema *et al.* 2009).

On the other hand, it may also be claimed that network-based management of water resources across administrative borders may fail because network governance lacks binding decision-making mechanisms and democratic legitimacy (Lundqvist 2004; Papadopoulos 2008; Stoker 2011). The logic of common pool resources invites free rider behaviour, leading to actors not being willing to participate in joint action if there is no authority with the power to enforce such decisions. In water management this may be particularly problematic in the relations between upstream and downstream actors. Pollution from an upstream community may not be a big problem for the community causing the pollution, but may lead to reduced water quality and eutrophication in downstream communities (Lundqvist 2004).

The challenges confronting water management may be seen as ‘social dilemmas’, whereby uncoordinated actors pursuing their own immediate interests undermine the interests of the collectivity – and also in the long run their own interests (Ostrom 2009, 6). Conventional theory of collective action predicts that social dilemmas can hardly ever be solved by self-regulation (Olson 1965; Hardin 1968), and therefore some form of external higher level regulation is required in order to prioritise conflicting interests, avoid free riding and secure the public good (Dahl 1989, ch. 21; Flynn 2000). However, this conventional knowledge has also been challenged (Ostrom 2009), and as Elster (1989, 17) noted, cooperation may also be achieved “by decentralized, un-coerced means ... Decentralized solutions are more fundamental than centralized ones, since compliance with central directives is itself a collective action problem”.

The European Union’s (EU’s) Water Framework Directive (WFD) may be seen as one institutional approach to overcoming such problems and challenges. The Directive calls for an integrated multi-level and ecosystem-based planning system for managing European fresh water resources by establishing a knowledge-based system for river basin planning and management with the aim to secure ‘good status’ for all European waters by 2015. The system aims at integrating and coordinating water and land use within the borders of river basins. This is to be achieved by coordination and stakeholder participation at the local level through network governance, at the same time as local plans are coordinated in a multi-layered system, eventually ending up at national and EU levels (EU WFD 2000; Kallis and Butler 2001; Lundqvist 2004; Kampa, Weppen, and Dworak, 2011; Keskitalo and Pettersson 2012; Newig and Koontz 2013).

This paper analyses one particular case – the Morsa River Basin in Norway. In the terminology of the WFD, Morsa is a sub-district within the wider regional context of the Glomma River Basin District (RBD). Based on a short theoretical discussion of multi-level governance, identifying four basic principles for multi-level network governance of water resources, and after a presentation of the Morsa case, I shall describe and discuss the experiences with Morsa as seen from inside, based on documentary sources and extensive interviews with key actors.

The main question asked in this paper is how the Water Framework Directive has been implemented in the Morsa case, with a particular emphasis on examining how and

to what extent the network organisational model of Morsa has been effective in developing and implementing collective action, legitimacy and democratic practices. Since Morsa has been a pilot case for implementing the WFD in Norway the Morsa experiences ought to be useful for the wider implementation of the WFD. Therefore, the choice of Morsa as a case was motivated by the fact that this is one of the first pilot projects for implementation of the WFD in Norway, and that the network cooperation between the involved actors was already established before Morsa became a pilot for implementing the WFD. This makes it possible to study not only the planning but also the implementation of measures and policies. Second, Morsa has been chosen because it is seen as a fairly successful example of collective water management through network governance (Stokke 2006). By examining this case in more detail, we may therefore hope to identify knowledge which will be seen as useful for other river basins and more generally for the implementation of the WFD.

2. Theoretical framework

Multi-level governance has been defined as “negotiated, non-hierarchical exchange between institutions at the transnational, national, regional and local levels” (Peters and Pierre 2001, 131). Multi-level governance may hence be related to the classical distinction between ‘government’ and ‘governance’, where *government* refers to traditional Weberian forms of hierarchical public administration, and *governance* refers to societal steering more based on networks, public private cooperation and more polycentric and participative forms of government (Rhodes 1994; Newig and Koontz 2013). Multi-level governance is therefore also frequently referred to as one form of network governance (Sørensen and Torfing 2005).

Hooghe and Marks (Marks and Hooghe 2003; Hooghe and Marks 2010) have made a distinction between two types of network governance: Type I governance is concerned with the formal multi-level system of government, ranging from the national through regional and down to local tiers of the government system. In this nested system of government authorities, legitimacy of decisions is generally rooted in elected political bodies and in more or less clear distinctions between politics and administration. On the other hand, Type II governance is more independent of formal jurisdictions and formal lines of authority. It consists of purpose-specific networks “intended to respond flexibly to changing citizen preferences and functional requirements” (Hooghe and Marks 2010, 21). The overarching goal has been said to be “greater effectiveness in tackling the problems that the public most care about” (Stoker 2011, 18). Network governance can be analysed at various territorial levels from the national and sub-national to international and cross-border networks (Peters and Pierre 2001).

Based on a review of governance literature, Huiteima *et al.* (2009) formulated four institutional prescriptions for water management according the principles of multi-level network governance: *management at a bioregional scale*; collaboration in a *polycentric governance* system; *public participation*; and a *knowledge-based* and experimental approach to resource management.

In water resources management *the bioregional perspective* would mean watershed/ river basin management. Water resources seldom (or in practice never) coincide with administrative and political borders. Watershed management may therefore be achieved either by establishing network governance structures as cooperation between existing jurisdictions, or by creating new river basin authorities. This may be interpreted as a choice between Type I and Type II governance. In either case the potential conflicts

between upstream and downstream local authorities will be a challenge (Lundqvist 2004, 420).

Polycentric governance is understood as governance systems with multiple centres or nodes of decision making rather than hierarchical systems radiating from one superior centre of control (monocentric). Polycentric systems are expected to be more flexible and resilient for coping with change and uncertainty. However, polycentric forms of governance may undermine the role and power of elected government (Stoker 2011) and be democratically problematic (Lundqvist 2004; Sørensen and Torfing 2005; Papadopoulos 2008).

Public participation refers to collaboration between governmental and non-governmental stakeholders. Involving stakeholders and the civil society in the actual management process is claimed to improve the quality of decision making by making better use of knowledge and information available in society, and by improving the public understanding of management issues at stake (Newig and Koontz 2013). In this respect, the scope of participants, i.e. the identification of participants seen as relevant for the task at hand, has been claimed to be important for the outcome (Özerol and Newig, 2008). On the other hand, unclear rules for participation may favour strong groups and individuals and again be a democratic problem. There may also be a trade-off between democratic legitimacy and effectiveness (Newig and Kvarda 2012).

Multi-level water governance should be *knowledge-based* and organised as a learning process (an 'experimental approach'). According to Huitema *et al.* (2009), this may refer to two different meanings: management as based on testing of hypotheses on ecosystem response to management interventions, and management itself being 'experimental', i.e. a learning process.

The rest of this paper presents an examination of the Morsa River Basin structured around these four principles for multi-level water governance and in the light of the distinction between Type I and Type II governance.

3. Data and methodology

The paper is based on two main sources. The first is documentary data, including reports, brochures and minutes from meetings of the Governing Board¹ and the sub-committees of the Morsa network. The second source is a number of in-depth interviews with key actors in the Morsa organisation selected in order to cover all groups of stakeholders. In total 22 interviews were carried out during the autumn and winter of 2011/2012. The interviews were semi-structured, following a rather open interview guide, with possibilities to ask follow-up questions and for bringing up more specific experiences which individual respondents might have. The interview guide covered factual questions about Morsa as well as questions about assessment of results, functioning of the organisational model, factors facilitating and hampering cooperation (particularly between upstream and downstream communities), the role of research (and researchers), and a particular emphasis on agriculture and farmers. The interviews aimed more generally at gaining as broad and detailed in-depth picture as possible of how the multi-level network of Morsa looked and was experienced, as seen from the inside and in a bottom-up perspective. Each interview lasted from approximately two to four hours. Most of the interviews were recorded on tape and transcribed word by word. Some were documented by detailed notes written up immediately after each interview. The transcribed interviews were analysed qualitatively by extracting quotes and viewpoints and structuring these under each of the key issues as listed above. A few typical and representative quotes are included in the empirical sections below.

4. The Morsa River Basin case

4.1. Morsa from project to RBD sub-district

Norway has adopted the EU's WFD and a special regulatory framework (The Water Regulation) has been in place since 2007. The country is subdivided into 11 River Basin Districts (RBD) which are again subdivided into 105 sub-districts. Morsa is at the bottom of this hierarchy as a sub-district within the wider Glomma RBD (see map in Figure 1). The system for water management under the WFD in Norway is closely linked to Norway's system of local government. This is a two-tier system consisting of 19 counties and approximately 430 municipalities. Municipalities in Norway are generally small with an average population of approximately 10,000. At the county level, authority is divided between the County Governor as the central government's regional representative, and the County Municipality which is the locally elected body at county level. Both at the RBD level and at the sub-district level municipalities, elected and state county authorities, sector authorities (such as agriculture, health, roads, etc.) are supposed to participate on the respective water boards together with civil society organisations and stakeholder interests.

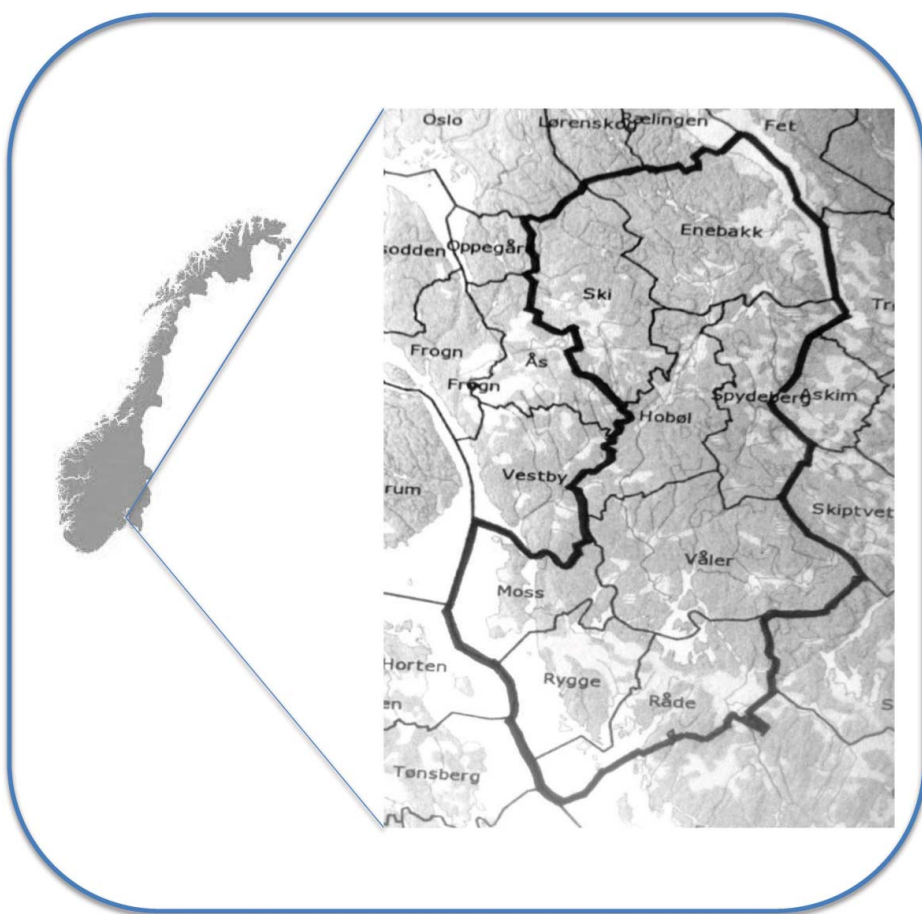


Figure 1. Map of Morsa.

Morsa started in 1999 as a voluntary cooperation project between eight municipalities along the Morsa River catchment, and with an aim to "... achieve environmental improvements concerning water quality, biological diversity, landscape and recreation, together with developing further a sustainable agriculture with a local basis" (*Handlingsplan for Morsa (Action plan for Morsa) 2002–2005*, 2003, 11) (my translation).

The eight municipalities include Enebakk, Hobøl, Moss, Rygge, Råde, Ski, Spydeberg and Våler, ranging in population size from the smallest, Våler and Hobøl, with approximately 5000 inhabitants (in 2012), to the city of Moss with just over 30,000.

The Morsa project was planned to last for four years until February 2004. It was first extended to the end of 2004, and from 2005 it was made a pilot project for the Norwegian implementation of the WFD. It was only in 2007 that the Morsa project was turned into a sub-district under the wider Glomma Water Region. In 2010 the timeframe for the Morsa Water District Board was extended to the end of 2015.² The study reported in this paper covers the whole period, both before and after Morsa was integrated into the WFD system. Different from other possible cases that would have started from scratch in 2007, Morsa therefore makes it possible to study not only the planning process of a sub-district but the whole process from planning to implementation. This is particularly important since the issue of implementation may be the real challenge of the WFD.

The Morsa catchment straddles the border of two counties, Akershus and Østfold, and covers a total area of about 1150 km². Morsa is a typical Norwegian lowland watercourse running from inland forest areas through agricultural landscapes before it drains into the Vansjø Lake, which is the biggest lake in Østfold, covering an area of 36 km² and a shoreline of more than 200 km. From its outlet, Vansjø drains into the eastern side of the Oslo fjord at the city of Moss. The Vansjø Lake is the drinking water source for more than 60,000 people downstream in the watercourse around the city of Moss, and the lake is an important source of recreation for a large number of people in the wider region.

4.2. Environmental challenges

The main problem which motivated the establishment of the Morsa project in 1999 was the increasingly serious situation concerning eutrophication of Vansjø and other smaller lakes in the river basin. An influx of nutrients (phosphorus and nitrogen) to the lake caused the growth of cyanobacteria (blue-green algae) and led to a ban on bathing in parts of the lake. The use of the lake as a source of drinking water was seriously threatened. The problems were seen to be caused by two main factors: (1) changes in agricultural practices, with a shift from grass to grain and vegetable production, more use of fertiliser and cultivation of wetland areas with draining, channelling and levelling of landscapes to allow more efficient use of modern machinery; and (2) population growth along the watercourse with a strong increase in the number of water toilets and local sewage emissions from dispersed sources. The infrastructure was old and inadequate and a large number of dispersed sources went straight into the water without any purification at all (*Handlingsplan for Morsa (Action plan for Morsa) 2002–2005*, 2003, 12).

4.4. Activities and achievements

In line with the integrated bioregional approach and a knowledge-based management perspective, planning activities, remedial efforts and policy measures have been directed towards three broad categories of activities.

First – and most important – Morsa has initiated, planned and coordinated a number of practical measures and activities to be implemented by municipalities, by households and

farmers, in order to reduce the inflow of phosphorus and nitrogen to the lake. Such measures include environmental contracts with 75% of the farmers around Western Vansjø. Contracts include measures such as reduced use of fertiliser, programmes to make farmers abstain from autumn ploughing, buffer zones close to open water, grass cover in areas most exposed to erosion and building of catch dams to prevent nutrient particles in the surface water going directly into the water course. The measures have been supported by government subsidies and grants, but substantial costs have been carried by the farmers. An extensive programme for purification of sewage from dispersed settlements along the whole watercourse has been carried out. This has cost the individual households substantial sums. Municipalities are working on new measures to treat surface water from denser settlements. In the lake itself, experiments changing the regulation regime have been carried out. Such changes are controversial since the economic interests of the hydro power producer to keep water levels high come into conflict with the interests of the farmers to protect their fields from flooding. Furthermore, a limited programme for changing the stock of fish in the lake has been carried out.

Second is research and monitoring. From the very outset, Morsa has been based on active involvement of researchers to map and quantify various sources of pollution to the watercourse (Vogt and Orderud 2013). After the first main report in 2001 (Solheim, Vagstad, and Kraft 2001) which formed the basis for the first action plan, activities have been followed up by regular monitoring. In turn, monitoring has been followed up by more research and testing, rejecting the claim that the lake is 'self-fertilising', i.e. that the nutrients are coming from the sediments of the lake itself (Andersen *et al.*, 2006).

Third and finally, Morsa has placed much emphasis on disseminating information about the projects, the situation in the watercourse, challenges and progress as well as popularised research results to the wider public. The project's web-site (www.morsa.org) contains extensive information about the programme.

The general understanding is that the water quality in Vansjø has improved, and this is also how our respondents have experienced the situation. Many of them mentioned that once again it is now safe to bathe and use the lake for recreation. Monitoring results show reduced levels of phosphorus and poisonous blue-green algae. Monitoring also shows lower levels of nutrient flow from rivers and creeks into Vansjø. However, in spite of this, monitoring results show less improvement in water quality than expected. The main reason is thought to be climatic changes with more washing out of nutrients from the ground. The monitoring research programme has also pointed to the possibility that reduction of acid rain has led to more eutrophication. Acid rain contains aluminium which reacts with phosphorus in order to reduce eutrophication. It is therefore assumed that without the measures implemented by Morsa the situation would probably have been even worse (Vogt and Orderud 2013).

5. Morsa as multi-level governance

How does Morsa fit in with the principles of multilevel water management as discussed in Section 2 of this paper, and how has Morsa met the challenges of this management perspective?

5.1. A bioregional organisation

The EU's WFD is based on the bioregional principles for water management, and the fact that Morsa was already based on such a principle made the transition to a water district under the WFD simple. As explained above, Morsa was initially established in order to

improve the water quality in the Morsa catchment area. Since the catchment crosses the border between two counties and is subdivided into eight municipalities upstream and downstream of the catchment, there was no possible way that the problems could be solved without involving actors, both public and private, along the watercourse. An important point to be borne in mind is that in Norway the municipalities (even though they are generally small) are responsible for land use planning and water and wastewater management. Hence Morsa was, and is, organised as a bottom-up network involving a wide range of public and private participants, and with the municipalities forming the territorial borders of the network. The core of the network is the Governing Board, consisting of the mayors of the participating municipalities, politically appointed representatives for the two county councils of Akershus and Østfold, representatives of the county governors of Akershus and of Østfold, one representative of Norwegian Water Resources and Energy Directorate, and one representative of Norwegian Food Safety Authority. In addition to the members, the Governing Board also includes a number of observers representing stakeholder interests: the farmers' organisations of Østfold and of Akershus, Forum for Nature and Outdoor Life, which is an umbrella organisation for a number of NGOs in the field of nature, environment and outdoor life, MOVAR (the inter-municipal water and renovation company in the region), Vansjø landowner association, Moss association for factory owners, and the municipality of Oslo. One of the mayors serves as leader of the Board.

A full-time project manager is responsible for the day-to-day running of activities and the preparation of agendas for the Board. The same project manager has been in office since the start of the Morsa project back in 1999 and has served an important role as coordinator and for keeping up continuity.

The project manager also serves as the link to the thematic groups, which are working groups concerned with preparation of professional and technical issues and preparing input and recommendations for the discussions in the Governing Board. The thematic groups comprise relevant technical experts, recruited mainly from the technical sectors in the municipalities and the regional state sectors for agriculture and for environment. The activity has been funded partly by contributions from the municipalities, differentiated according to number of inhabitants, partly by external contributions/funding from government, and partly by project funding to specific projects. In addition, the municipalities, individual property owners and farmers have benefited from government subsidies to activities and special measures carried out under the Morsa programme.

5.2. Polycentric and multi-level

On being asked what has been the biggest challenge for Morsa, one of the respondents answered that this had been a double challenge: one had been to keep the municipalities together, and the other to make sure that central authorities keep up their focus (#13)³. The answer reflects the multi-level *and* the polycentric character of Morsa; it is a horizontal network between the involved municipalities, but it is also a network involving regional and national authorities. On the surface, the challenge of keeping the municipalities together may be the most critical. According to rational theories, the municipalities along a water course should be expected to have conflicting interests. At least with regard to willingness to take on costs for environmental improvement upstream in order to improve the environment downstream, it would be expected that the upstream municipalities would not be interested in participating (Lundqvist 2004).

The respondents gave two main reasons why the upstream municipalities joined and continued to contribute. One was the support and pressure from national and regional authorities: “I would say that it is because the project was so heavily supported from the top with eight municipalities plus the County” (#7). Another respondent pointed out that one important reason why all joined was the ‘threat’ from the WFD. There was a widespread understanding that if nothing was done voluntarily, the government, backed by the WFD, would implement measures by regulations and duress (#14).

The other main reason which was mentioned repeatedly in the interviews referred to the sense of community and joint responsibility that had been developed over time in the network. One respondent said: “I assume it is some sense of community, that we have a joint responsibility for the environment, and that is why we choose to join in the first place. . . . Somebody needs to take responsibility and (participation) gives us knowledge which I think may turn out to become useful later” (#6). Or, as it was put by another: “I do also think that there was so much wisdom in people that they understood that we cannot shit – to say it directly – in a big source of drinking water for 60,000 people” (#7).

It is obvious that the project has succeeded in developing some sort of solidarity across municipal borders (Stokke 2006). In spite of the lack of any central or joint decision making body, Morsa has developed joint strategies, agreed on measures, and set targets for goal achievement in the participating municipalities. Supported by government incentives, agreed measures have been reasonably successfully implemented in the municipalities and among the farmers. Political leaders in Morsa have also taken advantage of their political contacts at the national level to secure economic support for Morsa (Stokke 2006). Formulation of policies and implementation of measures have taken place as an *ad hoc* process, supported by research-based knowledge about the sources and flow of nutrients, and is hence a practical example of adaptive management.

This seemingly harmonious situation did not fall from the sky. As already mentioned, the County Governors of the two counties had a strong hand in supporting the establishment of Morsa back in 1999. When Morsa was established as a network between the eight municipalities and the relevant state sectors, and with the County Governor’s Environment Department in the role as the organisation pushing for establishing the network, particularly one person in the County Governor’s Environmental Department in Østfold saw this as his ‘baby’ and as a top-down instrument, and in line with the idea that participation and involvement of stakeholders would support the implementation of state policies (Newig and Kvarda 2012). This was the feeling of the study participants when they looked back. However, when the position of project manager was announced, an external applicant was appointed to the post, and her approach was completely different. She argued for developing the network as a bottom-up structure where all partners should be involved and decisions reached through consensus building and voluntary action rather than top-down use of compulsion and duress.

According to a number of informants, this conflict and power struggle dominated the agenda of Morsa during the first project period. When the initial period ended in 2004 the opponents of the project leadership wanted to terminate the activity, and some of the municipalities took some time to decide whether they should join for a second phase. If the project can be seen as an example of network governance, the opposition also took the form of a network. As one of the informants noted, the opposition was not only a single person as it could be seen as an informal opposing network: “It was a network of men in different organisations, parties and businesses . . . like a spider web where they reappeared in various groups and forums, political parties and organisations . . .” (#1).

Gradually, however, the opposition lost ground. The top management in the County Governor's office supported the Morsa leadership and the most active opponent was gradually removed from working with the project.

5.3. *Participation and involvement of stakeholders*

In network governance theory, participation on equal terms of public as well as private stakeholders is seen as a condition for democracy and as a condition for effective decision making and implementation. The Morsa network meets this requirement, but with some qualifications. Morsa may best be described as a type of 'centrifugal network', where the core consists of the mayors of the participating municipalities, together with representatives of regional and government authorities who are full members of the Morsa Governing Board. There are also the observers on the Board, members without voting power. These include, civil society representatives from farmers' organisations, environmental organisations etc. Finally, there is the outer circle of network participants linked to the thematic teams. These are technical experts or members from civil society. The description of Morsa as a polycentric network is therefore only part of the story. Morsa is a polycentric network in the sense that the municipalities (i.e. the mayors together with representatives for relevant governmental sectors) form a horizontal network of decision-making nodes for planning and for implementing the recommendations of the Board. However, at the same time Morsa has a layered structure with the core network at the top.

Hence, Morsa is not a network where all stakeholders participate on equal terms. The 'power core' of the network consists of the municipalities and state sector authorities. Civil society representatives, such as environmentalists and representatives of recreational interests are playing a more marginal role. This was also reflected in some of the interviews. The feeling was expressed that almost all efforts had gone into documenting the sources and flow of nutrients, with little effort put into learning more about the wider use of the watercourse. Fishing and other activities related to outdoor life seem not to have had a big role. There has not been much concern about how the watercourse is being used in total, or as one respondent expressed:

No, not enough. And now, that needs to be said, we are touching on a theme where there are divided opinions among people . . . , and that is that Vansjø is an important recreational area . . . The divided opinions have to do with how we shall accept that Vansjø can be used for recreation when it is the source for drinking water for 60,000 people. (#13)

Most remarkable is the weak direct representation of farmers in the network. Farmers are represented as observers by their organisations at the county level, but practising farmers along the waterway are not directly involved in the network. They are involved only indirectly by being invited into programme activities organised by agricultural authorities and Morsa management, through direct contacts with individual farmers to discuss improved practices, and involved as discussion partners through seminars and conferences. A number of our respondents also underscored the importance played by pioneer farmers. Morsa has chosen a strategy of convincing selected opinion leaders among the farmers, and through their example change the attitude of farmers on a broader front.

5.4. *Knowledge-based management*

Mixed with the diverging views on strategies and working methods during the first phase of Morsa was the issue of the factual situation concerning the causes and sources of

eutrophication. Here the project manager insisted on founding policies and measures on research-based knowledge. Research institutions were brought in, and a research report was commissioned at the beginning of the project to serve as a basis for the action plan (Solheim, Vagstad, and Kraft 2001). A particular issue was the question of whether the lake was self-fertilising to a large extent. Much of the professional criticism against the project manager during the first phase of the project was based on a claim that this was the case. It was only when a scientific report documented beyond doubt that the inflow of nutrients into the lake is an important source of eutrophication that the opposition lost ground (Andersen *et al.* 2006). According to one of the informants, this report was decisive in settling the conflict between the project manager and her opponents, led by the most active critic in the Office of the County Governor in Østfold:

What finally led to the burying of the hatchet was actually the knowledge which came about the flow (of nutrients) from the sediments and from the local area. When the results came, it was only then that he gave up the fight, strictly speaking. (#1)

At the same time as Board members expressed a strong belief in research, their insight and comprehension of research was more limited, and some of them found it difficult to follow the presentations given by researchers. They strongly emphasised the key role of the manager as a disseminating link between the researchers and the Board members.

I have very good experience with the project manager when it comes to disseminating research. She has always been concerned that knowledge shall be available to members of the Board. It is more difficult when we meet the researchers directly. (#2)

Another politician on the Board said:

HG (the project manager) has the professional knowledge and we had to have confidence in her suggestions and proposals being the correct ones. (#6)

The interviews included a few knowledge questions to test whether the respondents had understood key research findings. Some of the respondents (those most active, and particularly the professionals in the thematic working groups) were reasonably well informed. Others, and particularly the politicians, who were the actual decision makers, showed far less insight. Or, as one of the mayors stated:

There are many things that we mayors need to get involved in ... and if I should protest and say that I disagree, then I would need to have knowledge about it. If not I wouldn't have much to show for me. I can't just start quarreling with HG and say that this is a measure that I don't believe in if I don't have a clue. (#6)

The general finding is that at the same time as there is a strong belief and confidence in research and research-based knowledge, the actual understanding and insight into the research results on which Morsa policies are based is rather weak. Research results have been presented and discussed in seminars and conferences, but there seems to have been little active and critical discussion of research in the Morsa Board. Some of the respondents expressed the view that there was more communication of research results than professional discussions:

But I do feel that the professional debate in a way is left out. You are told something, and then we go on. In a way we feel that with a strong and skilful project leader it becomes in a way a one man show. (#16)

Another critical voice concerning the role of research came from the outdoor life and environmental interests, reflecting the more marginalised role of such interests in Morsa, and pointing out that these interests had not been able to mobilise much research. Hence they were also seen to be more easily marginalised in the debate:

You are much more exposed to criticism if opposition against a measure is seen as more based on weakly founded opinions and feelings. And if we for example talk about environmentalists more generally, who may have other value judgements and priorities ... then it may be more difficult to argue in favour of one's cause ... if you don't have the scientific basis for what you are doing. (#10)

The importance of knowledge is also underscored as a key factor for keeping the network together. The clear documentation that emissions from upstream in the waterway had detrimental effects on water quality downstream, and that it would be impossible to clean Vansjø if the upstream municipalities refused to participate, was felt as a pressure:

The impact analysis – or what it was called – came on the table ... and it documented how many kg or tons of phosphorus were released and where it came from, from what rivers and creeks. These diagrams were very closely examined and were used in the process – in relation to politicians as well as ordinary people. ... It was constantly droned on the polluter pay principle, and they (the upstream municipalities) are obviously polluters to the watercourse, so that combination (together with documentation) was what in my opinion actually got approval at last. (#8)

The open process with publicity about the problems as well as information about achievements and results was also claimed to serve in a disciplinary manner:

In a way it works somehow as a form of self-discipline. We present, both internally and externally, information and statistics about goal achievement in the different municipalities. ... It shows where they have been good at abstaining from autumn ploughing, or which municipality is lagging behind concerning sewage renovation. It develops some kind of inner self control within the Morsa cooperation. (#13)

What we see in Morsa is obviously that a solid research- and knowledge-based management has been important, and we see that there is fundamental confidence in research and in the solutions and measures presented by researchers. However, we also see that knowledge does not 'work by itself'. There has been a need to translate knowledge into action. More clearly, most actors have a poor understanding of research but they have strong confidence in the policy recommendations based on research and backed by researchers.

6. Discussion

Morsa is an example of multi-level water resources management. At the same time that the problems and challenges exist and must be tackled at the local level and across municipal borders, local action is more or less dependent on national regulation or nationally controlled policy instruments. We also see, as has been observed in other

cases, a general trust in public authorities (Orderud and Polickova-Dobiasova 2010, 214), or in other words, in Type I governance. Seen in relation to Marks and Hooghe's conceptual schema (Hooghe and Marks 2010), Morsa may be seen as a Type II governance network integrated with and building on the structure of the Norwegian Type I governance. Contrary to what has been observed in other cases, that network governance has led to "the changing role of local authorities, away from a regulatory role towards one of enabling others to act" (Bulkeley and Betsill 2005, 56); in the case of Morsa the network has facilitated and supported the regulatory role of the municipalities *vis-à-vis* private actors, for example, in implementing municipal programmes for private sewage purification plants.

Morsa may hence be seen as a typical example of polycentric governance (Huiteima *et al.* 2009), and of how "... conventional sector policies to water management are insufficient to ensure sound water development" (Tropp 2007, 29). The experience of Morsa demonstrates clearly the need for extensive bargaining and deliberation in order to reach common solutions within such a network. Morsa also demonstrates how actors in the classical hierarchical system of government tend to be reluctant to give up their power positions (Huiteima *et al.* 2009). Instead, the common approach is to build networks from above as power instruments for strengthening hierarchical governance (Newig and Kvarda 2012; Newig and Koontz 2013). Hence a common theme in most interviews was the initial conflict between a top-down approach, based on the assumption that the network should and could be used as an instrument for implementing top-down sector policies based in the County Governor's office on the one hand, and a bottom-up approach on the other hand. The fact that Morsa seems to have succeeded with the latter has led to joint action and a more solid foundation of environmental measures in the municipalities, but still within the framework of national policies, demonstrating how national government depends on participation and consent from below in order to implement policies (Hanssen, Mydske, and Dahle 2012).

In Section 2, a distinction was made between two approaches to the use of science and knowledge, either as testing of hypotheses on ecosystem response to management interventions, or as elements in a learning process where the interpretation of scientific knowledge is itself a part of the bargaining and negotiation processes in the network. In the case of Morsa, research is used in the first of these meanings. Research results were disseminated, not negotiated. The researchers were not members of the network organisation. Research was commissioned and the researchers were brought in from outside and served to distinguish right from wrong. Researchers were 'judges' and 'truth tellers' more than 'discussion partners'. As has already been noted, research was an important element in strengthening the project manager's leadership in the struggle with the above-mentioned opponents and in running the Board. She was the main link between the researchers and members; and as the interviews disclosed, most politicians had only vague ideas about the professional content of the research. On the other hand, they expressed strong confidence in researchers, the research results and the recommendations from the researchers. We see a use of research that is more in line with what Carol Weiss called 'strategic' use of research (Weiss 1977) than with more participative uses of research and knowledge (Novotny, Scott, and Gibbons 2001; Funtowicz and Ravetz 2013).

Another factor concerning public participation, is that the Morsa network shows contrasts compared to the ideal principles for multi-level water governance. The core members are government representatives – or put differently – actors who are also placed in the Type I governance network. Representatives of civil society, such as

environmentalist organisations, farmers and businesses, are observers. Technical experts are placed in the thematic groups where they provide expert knowledge to the Board. How then should this construction be assessed as a democratic construct? In the Morsa model, decision-making power is not removed from any elected body. Decisions in Morsa are recommendations to municipalities and in some cases to state authorities. By the fact that Morsa is a network of the political leaders in the same institutions that are implementing authorities for the policies and measures recommended by Morsa, there is a strong pressure on these leaders to fight for and gain support for implementing the policies in their respective institutions/municipalities. This is also an important key to understanding the solidarity across municipal borders and the remarkable capacity of Morsa to overcome the up-stream-downstream dilemma without establishing a superior water authority with the power to force joint policies on the municipalities from above. In addition, in spite of the fact that the voluntary participation of farmers has been a key to the success of Morsa, the farmers have not been directly represented in the Board, only indirectly as observers through their organisation. The task of convincing the farmers and securing their support has taken place as more informal processes by representatives of their organisation, in internal processes in each municipality, and has basically been the responsibility of the mayors, together with the county agricultural administration and field advisory service.

Advocates of adaptive water management tend to favour Type II forms of network governance, based on direct participation of stakeholders and civil society. Such forms of governance usually relate directly to the bureaucracy and represent a type of ‘shortcut’, bypassing the elected politicians operating in the Type I hierarchical system of governance. This has also been referred to as ‘output democracy’ in contrast to ‘input democracy’ (Peters 2008; Christensen and Lægreid 2011). The criticism against output democracy is usually that it is lacking in democratic accountability (Lundqvist 2004, 421) and that it erodes “traditional bases of political power” (Eckerberg and Joas 2004, 406). Here the Morsa experience seems to represent an interesting hybrid by actually linking Type II and Type I forms of governance. More research and case studies in other water districts could indicate an answer to the question of whether Morsa is a unique case, or whether the Morsa model may actually have theoretical significance as a more general model for water resources management.

This brings us to the importance of leadership. What generally stands out through most of the interviews is the key role played by individuals for determining the success or failure of Morsa. The project manager has played a particularly important role. She is a professional with solid and relevant scientific background, but she has also shown a strong ability to communicate and to involve ‘everyone’ in the processes of Morsa; the respondents gave her much of the praise for what they saw as the success of the cooperation. One of the interviewees said:

I would say that in the beginning it differed in all directions. If it hadn’t been for the fact that HG is very patient and knows how to strike the right chords to make the municipalities cooperate, and not least involve farmers and all other stakeholders as observers ... and with her ability to listen – it would never have worked. (#14)

And another respondent commented more directly on the difference in working practice between the project management and the old practice in the County Governor’s office (see Section 5.2 above), noting that the difference was not so much different priorities:

... but he hadn't the ability to convince a single farmer. He ended up falling out with all of them. ... HG has succeeded in keeping on good terms with agriculture, while he was on bad terms with them. That is a substantial difference for getting something done. (#20)

Hence, as already noted, Morsa gradually changed from an early state as a top-down governance initiative aiming to harmonise municipal and farming practices into a more consensus-oriented network, based on negotiations and bargaining. When we undertook the interviews, respondents were quite unanimous in maintaining that with the 'old strategy' it would have been quite impossible to achieve what has actually been achieved.

The importance of leadership also extends to the role of the mayors. The fact that the municipalities have been represented on the Governing Board with their top political positions has given the network political weight in the individual municipalities. The involvement of the mayors was a key strategy when the Morsa network organisation was established. As one of the respondents noted:

When the project leader and the chairman of the Board visited the municipalities, they emphasised the importance of involving the mayor in order to secure support. There was obviously resistance among the farmers. It was therefore important that the municipality backed it. (#19)

Once the mayors had sat together on the Morsa Board and agreed on joint measures, they had also taken on a moral commitment for implementing the measures back home in their municipalities. More or less all respondents were unanimous in underscoring the importance of having the mayors representing the municipalities, and many related this to the network character of Morsa and the fact that Morsa as a network organisation had not delegated any decision-making authority from the municipalities. One answer may be quoted as representative for this view:

It is clear that the water district has absolutely no decision-making power. It has no formal authority and is in no position to do anything to anybody. Then it is important that it is the mayors who are sitting on the Board and who have impact on their own municipality. ... When we agree on something in the board, we take this commitment with us back to our municipalities, or the County Municipality or the County Governor. (#13)

Leadership has also been important for convincing the farmers to participate. One important reason why a majority of farmers gradually came on board and have signed environmental contracts was said to be the role played by highly respected pioneering farmers who have served as leaders and role models for other farmers.

7. Conclusion

The point of departure for this paper was the question of how effective the multi-level network organisation of Morsa has been for implementing the principles of EU's WFD at the local level, and with a particular emphasis on *collective action*, *legitimacy* and *democratic practices*. The analysis has been structured in the light of four principles for multi-level water governance: management on a *bioregional scale*; *polycentric governance*; *public participation*; and an *experimental approach* to planning and management.

Morsa has succeeded in mobilising collective action across municipal borders upstream and downstream the Morsa catchment. This has been achieved in a context of

multi-level governance organised as a polycentric network on a bioregional scale, but without moving decision-making power away from the democratically elected local government institutions. One key factor has been the combination of horizontal and vertical network relations. Morsa may be described as a 'hybrid' of Type II and Type I governance. Central and regional government support has helped facilitate many of the policy measures of Morsa. At the same time, the actors were fully aware that if they had refused to participate deliberately, the alternative could be use of coercion by state authorities backed by the WFD. Network governance, as Scharpf noted, always exists in 'the shadow of hierarchy' (Scharpf 1999).

It is widely assumed that collective action in polycentric networks will be difficult since actors will follow their own narrow interests (Olson 1965; Hardin 1968). Morsa demonstrates how this is not an absolute truth, and that social action cannot be fully explained by rational theories, assuming that actors will always follow their isolated self-interests. There is also a strong component of responsibility for promoting the common good. As we see demonstrated in this case, this is supported by openness, transparency and knowledge (Ostrom 1990). Morsa has served to build a strong feeling of trust among the participants, and particularly important, among the mayors.

On the other hand, this is linked to the importance of leadership. The project leader has played a decisive role in keeping the network together, and has, together with committed mayors as chairmen of the Board, been instrumental for creating consensus, trust and enthusiasm. As Olsson *et al.* (2006) noted, network governance requires leadership, and lack of effective leadership is frequently a cause for failure. The fact that the network included the mayors as the key participants is also important and has been decisive for implementing network policies in the municipalities and for securing support from local actors, households and farmers.

Another interlinked factor has been the emphasis on a knowledge- and research-based approach. Knowledge has played a double role: to support legitimacy and to support leadership. The project manager has served as a 'knowledge broker' who has translated scientific results into policy-relevant knowledge, and research and monitoring results have been actively used to convince the participants and the public of the necessity of the various measures to reduce eutrophication. To a much lesser extent, research and learning has been a result of broad, participative and interactive processes between researchers and network participants. Research has been used strategically more than interactively. It has been produced more than co-produced.

Morsa was selected as a pilot for implementing the WFD in Norway because Morsa already fulfilled many of the conditions for water planning and management under the Directive, and because it was seen as relatively successful. The in-depth study reported in this paper and summarised here has hopefully provided some answers that will be relevant for the further implementation of the WFD. However, this study has been restricted to this single case. Further comparative case studies are called for in order to test the robustness and more general validity of these findings.

Acknowledgements

The research for this paper has been funded by the Research Council of Norway, grant no. 190028/S30. The author wishes to thank his colleague, Geir Orderud, who has been project leader for the social science part of the project for support and feedback. Thanks are also due to the anonymous reviewers for critical but valuable comments on an earlier version of the paper, and to Helena Dell'Ara for assistance with language editing.

Notes

1. In the terminology of the WFD this is the local Water Board. However, in daily use Morsa has kept the terminology from before becoming pilot under the WFD and I shall use Morsa's own terminology in this paper.
2. From 2011 the geographical area was extended to also include the Hølen and Hobbøl watercourses and three more municipalities became members of the Water District Board: Vestby, Ås and Frogn.
3. Direct quotations are my translation of the transcribed interviews. For the sake of documentation the interviews have been numbered, and where direct quotes are included in the text these are numbered as follows: (# interview number)

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