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Implementing EUs Water Framework Directive in Norway: Can the New River Basin Districts Ensure Environmental Policy Integration?

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Abstract

This article is an empirical analysis of Norway's implementation of the EU Water Framework Directive. Aiming at achieving good environmental status in all of Europe's waters by 2015, the Directive is seen as a case of 'environmental policy integration' because it requires all relevant branches of government to comply with the provisions of the directive. Norway is currently in the process of finalizing the first comprehensive round of planning. Results from a survey in two rounds to key actors indicate that some branches of government seem to have made less progress than others in terms of achieving environmental policy integration. These differences are analyzed by reference to variations in the institutional set-ups and regulatory mechanisms available in each sector. The structural preconditions for effective environmental regulation appear to be highly varied, and this may affect the potential for achieving the aims of the directive related to all stressors to the aquatic environment.

Keywords: Climate change adaptation; Policy innovation; Local government; Water framework directive

1. Introduction

This article investigates Norway's implementation of the EU Water Framework Directive (WFD, Directive 2000/60/EC), mandated by the Water Regulation of 2006. The WFD

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is designed to counter fragmentation tendencies in water management, in the sense that it addresses the full plethora of stressors to the aquatic environment, and the encompassing nature of the Directive means that its implementation affects a broad range of policy areas. Norway, having arguably a very fragmented system of water management, is an interesting case for studying the implementation of the WFD. Norway's political-administrative system allocates water issues horizontally between numerous sectors such as hydropower, fisheries, and agriculture. Inside each sector, moreover, there is a vertical division of competencies between the ministry level and the subordinate agency level. A common perception among actors involved is that the process towards fulfilling the environmental objectives laid down in the directive has progressed with a slower pace in some policy areas than in others (Hanssen, Hovik, & Hundere, 2014; Hovik & Hanssen, 2015; Indset & Stokke, 2014). Thus, within this context, this article seeks to answer the following questions:

1. What is the impact of the coordinative instruments of the water management system, and how can we understand the variations in compliance among the affected authorities?
2. What can the Norwegian case tell us about the specific relationship between horizontal and vertical coordination in order to attain environmental policy integration?

Our point of departure is to conceptualize the WFD as a case of *environmental policy integration*. As will be elaborated upon in the following section, such integration refers to the extent to which the WFD objective of achieving good environmental status has become integrated into the goal structures and policy priorities in each individual policy area, and across governmental levels. The relative degree of policy integration in each policy area is investigated by examining particulars of the regulatory instruments at stake, the institutional structures and policymaking traditions among the different sectorial authorities.

The article seeks to contribute to the growing body of studies that focus on regulatory and coordinative structures pertaining to WFD implementation within single countries (Galaz, 2006; Junier & Mostert, 2012; Lundqvist, 2004; Moss, 2004; Nielsen, Frederiksen, Pedersen, Saarikoski, & Rytkönen, 2013; Thiel & Egerton, 2011; Watson, Deeming, & Treffny, 2009), from a legal perspective (Albrecht, 2013; Louka & Louka, 2008) or with emphasis on the local level (Andersson, Petersson, & Jarsjö, 2012). Such studies strengthen the basis for comparisons of WFD implementation in various countries (Hedin et al., 2007; Liefferink, Wiering, & Uitenboogaart, 2011; Mednis, Matisovs, Teirumnieka, Martinovs, & Vaļģis, 2011; Organisation for Economic Co-operation and Development, 2011; Pahl-Wostl, Lebel, Knieper, & Nikitina, 2012). The article also contributes to studies of the spatial aspects of implementation related to planning (Borowski, Le Bourhis, Pahl-Wostl, & Barraque, 2008; Carter, 2007; Grindlay, Rodríguez, Molero, Zamorano, & Urrea, 2011; Parés, 2011), stakeholder participation (Blackstock, Waylen, Dunglinson, & Marshall, 2012; Carter & Howe, 2006) and the question of territorial fit/misfit with existing boundaries (Cohen & Davidson, 2011; Fish, Ioris, & Watson, 2010; Moss, 2008, 2012; Moss, Medd, Guy, & Marvin, 2009; Mostert, 2003; Norman, Bakker, & Cook, 2012; Young, 2006).

The following section points out the main stressors to aquatic environments in Norway, and presents the five spheres of activity that will be dealt with in empirically. In section 3, the

article elaborates on the concept of ''environmental policy integration'' and lays down the groundwork for analyzing the perceptions of the informants with reference to the structures and systems for such integration. Data and methods are described in section 4. Following this, section 5 presents the perceptions of key actors concerning the degree of policy integration in the five policy areas in question, and these perceptions are analyzed in light of varying legal and institutional structures in these areas. Section 6 concludes the article.

2. The Norwegian context: the aquatic environmental problems and the new water management system established to implement the EU's WFD

2.1. The aquatic environmental problems

Norway is an interesting case of WFD implementation due to its particularly diverse composition of water-related activities and, as a result, the highly composite pattern of aquatic environmental stressors that needs to be dealt with in order to achieve the WFD aims. A coastal country with high mountains and deep fjords, water has played a pivotal role in the industrial development of Norway. Norway is Europe's biggest and the world's number 6 hydropower producer (IEA, 2013) with a total production volume of 122 TWh, and the EU Renewables directive has set the pace for further development. However, manipulation of natural water quantity levels for storage purposes and drainage of river sections by the use of pipelines poses severe threats to biodiversity, fish stocks and flora. Because about 70 per cent of Norwegian water courses are regulated for the production of electricity, hydropower has been rated as the most important stressor to the aquatic environment in Norway. The full list of top ten stressors is presented in table 1.

Eutrophication is a significant problem in parts of Norway, mainly in calcareous waters in heavily populated areas where agriculture is a dominant industry. Nutrients leakages (phosphorous and nitrogen) from farmland causing eutrophication constitutes a significant pollution problem in the south-eastern and south western part of Norway, as well as in some intensive farming districts in other parts of the country. Another source of eutrophication is pollution from waste water. The main problem is the total number of discharges from houses and cottages in sparsely populated areas, due to ineffective or absent treatment systems. Discharges from cities and towns are less prevalent, due to intensive remediation in the last 30 years. But it is still a significant stressor in some places.

Table 1
Ten most important stressors to the aquatic environment in Norway. Source: Factsheet (Mdir, 2012)

1. Hydropower	**6. Run-off from urban areas**
2. Pollution (long distance transport)	**7. Sewage**
3. Agricultural run-off	**8. Polluted sediments**
4. Run-off from households	**9. Dams**
5. Foreign species	**10. Effects on salmon**

In later years, coastal aquaculture has developed with a tremendous speed. Sales of Atlantic salmon and Rainbow trout has almost tripled the last decade to more than 1,3 million metric tons in 2014 (DoF, 2016), generating significant export revenues and much sought-after activity in remote areas. Aquaculture has several impacts on the environment, such as eutrophication caused by emissions of nutrients, sea lice and escaped fish, which is seen as a significant threat for wild fish stocks, both genetically and ecologically.

Point-source pollution from the processing industries has traditionally represented significant stressors to the aquatic environment in Norway in a number of localities. New technologies as well as a general decline in some industries have however caused the significance of these stressors to decrease substantially. While they are no longer on the top ten list, they are still however prevalent in some localities. All in all, achieving good environmental status in all of Norway's waters implies potentially running against powerful actors and dealing with several conflicts of interest. Large profits are at stake, and the political clout of some of the industries involved is very significant.

2.2. The new water management system in accordance with the WFD

The WFD is designed to addresses the full plethora of stressors to the aquatic environment - not only chemical stressors, but also ecological aspects such as biodiversity and continuous habitats as well as 'hydro morphology', which denotes barriers and modifications to the flow of water. The main objective is to achieve 'good' environmental status, as well as to distribute the costs and gains associated with this aim as evenly as possible (EU, 2000). This requires coordination of a variety of policies and of public actors at different governmental levels (Nielsen et al., 2013). To this end, the WDF requires states to adopt an ecosystem-based principle of management.[1] This involves designating river basins as management units. The basic idea behind this is that water planning should be integrated across all water uses as well as integrated with other related policy issues (Hammer, Balfors, Mortberg, Petersson, & Quin, 2011; Nielsen et al., 2013). In the words of Cohen and Davidson (2011), the directive calls for a high degree of scalar fit between watersheds, 'problem-sheds' and 'policy-sheds'. Following this, the WFD clearly reflects the more general approach of 'environmental policy integration', a point that will be elaborated further on.

Norway has chosen to adhere to the ecosystem-based principle of management more closely than most other countries (Nielsen et al., 2013). A total of 11 national River Basin Districts (RBD) as well as 5 RBDs shared with Sweden or Finland have been set up. These are furthermore subdivided into 105 Sub-Districts (SDs). The RBD system is presented in figure 1.

The borders of these units cut across various other territorial demarcations, including municipalities (428), counties[2] (19) and regional branches of central state agencies. Each

[1] The WFD requires that «Member States shall identify the individual river basins lying within their national territory and, for the purpos of this Directive, shall assign them to individual River Basin Districts (Directive 2000/60/EC art. 4)

[2] The counties are multi-purpose authorities headed by a political county council that is elected every four years. While the formal term is 'county municipality', the term 'county' will be used henceforth for simplicity.

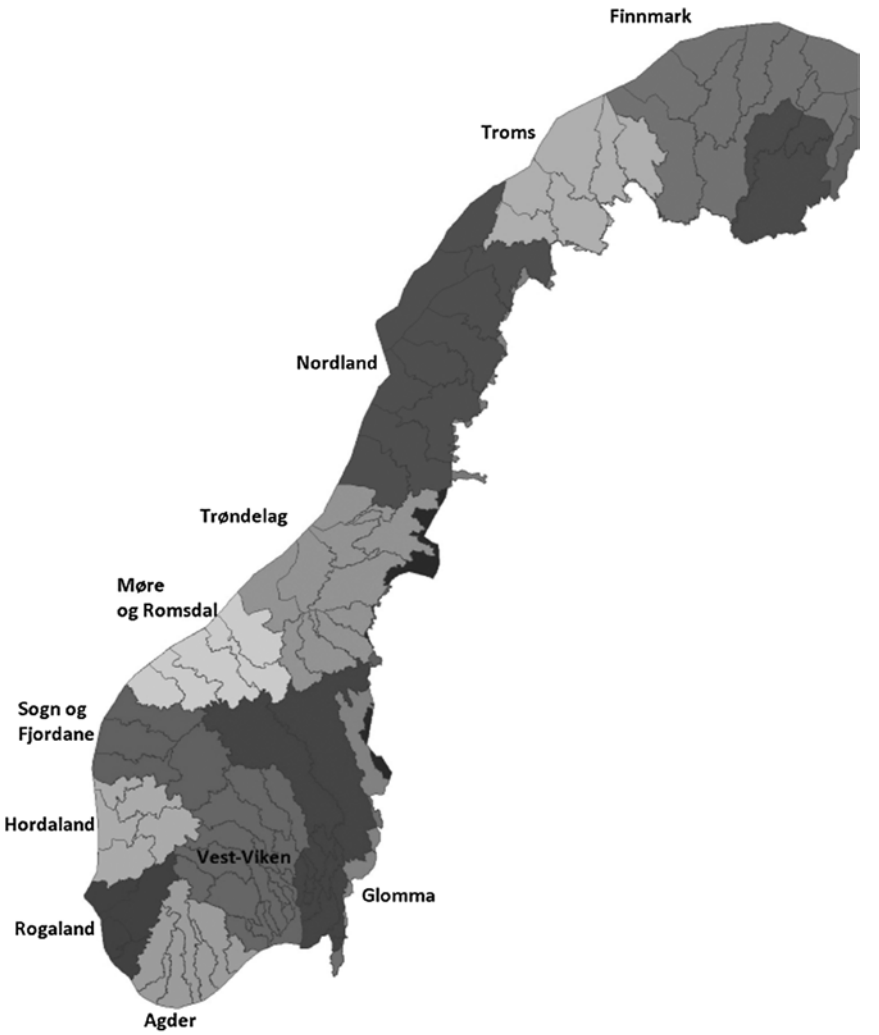

Figure 1. Norway's 11 River Basin Districts and 105 Sub-districts.
Source: Mdir (2016)

RBD is headed by a cross-sector, cross-level RBD-Water Board comprising all affected authorities at the local, regional and national levels[3]. Local level participants in the RBD boards are representatives from municipalities, often the Mayor and the chief executive. The national level is represented by the regional branches of national agencies and relevant regional state authorities[4]. The regional level is represented by counties.

[3] 11River Basin Districts (RBD, Vannregion), RBD Boards (RBDB, Vannregionutvalg), Sub-Districts (Vannområder), Sub-District Boards (Vannområdeutvalg)

[4] County Governor, The Directorate for fishery, The Norwegian Water Resources and Energy Directorate, the Norwegian Food Security Authority and the Norwegian Public Roads Administration

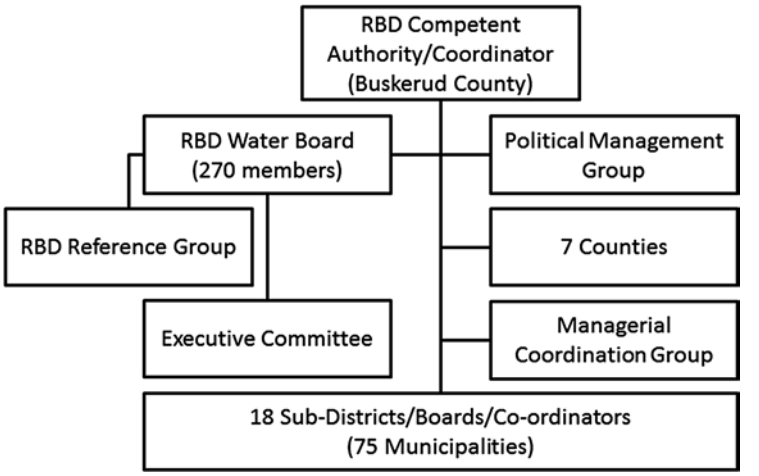

Figure 2. Illustration of the complex cross-sector, multi-level organization of Vest-Viken[6], one of Norway's 11 River Basin Districts

The regionalized implementation of the WFD in Norway is in line with the traditional emphasis on decentralization in Norwegian government, and sets Norway apart from many EU member states that have chosen a more centralized approach (Hedin et al., 2007; Nielsen et al., 2013). Each RBD may cover parts of the territory of several counties. One County in each RBD is 'RBD competent authority' and is in charge of coordination and facilitation of the planning process. This County chairs the RBD board, and designates a fulltime-coordinator for this task. The coordination role entails the coordination of different regionalized state agencies over which the Counties have no binding authority, such as for instance the County Governor[5], The Directorate for Fishery, The Norwegian Water Resources and Energy Directorate, the Norwegian Food Security Authority and the Norwegian Public Roads Administration. Many of these regional subdivisions, however, are not of the same size and shape as the Counties. The Counties are also expected to coordinate the efforts of the several municipalities within their RBD, but these enjoy extensive autonomy and their authority is traditionally compatible or even stronger than the Counties. Finally, the office of the County Governor maintains the role of coordinating professional actors and knowledge.

This institutional complexity is illustrated by the organization chart of RBD Vest-Viken, presented in figure 2.

Private actor interests are included by the establishment of broad advisory reference groups. The RBD-Boards are charged with drawing up 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

[5] The County governor is a general-purpose regional office of the central government.
[6] Source: Vannportalen (2013)

relevant measures. The planning process follows the EU schedule, in a 6-year planning cycle[7]. In this process, 104 Sub-Districts (SB), with their SD-Boards, are important arenas giving input. All the SBs have a full-time/half-time coordinator, often financed by groups of municipalities, but also by private actors like hydropower firms.

The first comprehensive round of RBD management plans in Norway was completed in late 2015. Because other European countries with few exceptions completed their first full cycle in 2009, Norway is one round behind most of the EU member states. The reason for this is that Norway as a non-member of the EU was required to implement the WFD only when it was deemed relevant for the ''European economic area'' (EEA) agreement (EEA, 1994). EEA is an agreement between the EU and Norway, Iceland and Liecthenstein that grants these states access to the internal market.

It is for the time being premature to assess the relative success of WFD implementation based on data on the effects of actual measures taken to achieve or maintain the environmental aims laid down in the WFD. A comparative analysis of the measures implemented in the various water-related sectors needs to be postponed until the measures decided upon in the first round of planning have been implemented.

3. Environmental policy integration

The concept environmental policy integration has its origins in a discourse initiated by the World Commission on Environment and Development (Brundtland, 1987). The Commission's call for making '. . .the major central economic and sectoral agencies of governments (. . .) directly responsible and fully accountable for ensuring that their policies, programs and budgets support development that is ecologically as well as economically sustainable' (*ibid*., p. 314) was integral to *Agenda 21* following the Rio summit in 1992. It was adopted by the OECD, and was given a legal basis through its inclusion in the Single European Act (EU, 1987) and later on in the Maastricht Treaty (EU, 1992).

The concept of environmental policy integration has been thoroughly explored by William Lafferty (2004) and associates (Lafferty & Hovden, 2003; Lafferty & Ruud, 2006). A definition of environmental policy integration emanating from this work is as follows:

'. . . the incorporation of environmental objectives into all stages of policymaking in non-environmental policy sectors, with a specific recognition of this goal as a guiding principle for the planning and execution of policy; accompanied by an attempt to aggregate presumed environmental consequences into an overall evaluation of policy, and a

[7] The cycle has five mandatory elements, starting with a baseline in which the existing conditions are mapped and analyzed. In Norway this has implied a classification and categorization of the quality of all 17 000 water bodies in the country. In the next step, essential challenges are formulated and pressures on water bodies identified, and then analyses of necessary measures are conducted, and environmental targets and norms for river basins defined. Then comes the formulation of a Management plan and a Programme of measures (PoM) and a Monitoring Programme. As in Poland and Sweden (Nielsen et al 2013), the processes of producing the Management plans involve several levels of government.

commitment to minimize contradictions between environmental and sectoral policies by giving principled priority to the former over the latter' (Lafferty, 2004, p. 201).

Lafferty and Ruud (2006) presented a simple conceptualization of environmental policy integration based on two dimensions; one horizontal and one vertical. ''Vertical'' policy integration denotes the ''greening'' of each sector of government; the extent to which each sector has integrated environmental concerns into its operational goal structure and implements this vertically through its internal organization. 'Horizontal' policy integration is about the coordinated pursuit of environmental concerns horizontally, across sectors – mediating conflicts between sectors, between environmental and other social concerns or between ''alternative possible consequences of specific environmental initiatives'' (*ibid*. p. 457). This article deals primarily with the vertical dimension.

Neither the World Commission nor Lafferty and Ruud provide a clear definition of the term ''sector of government''. In order to pinpoint the exact meaning of 'policy integration' the term however requires further elaboration. Moreover, by referring solely to 'government' the term downplays the role of non-governmental actors in policymaking processes. This is unfortunate in the present context, since empirical observations in our study indicate quite extensive patterns of interaction between various water-related regulatory agencies and actors in the industries they are set up to regulate, as well as NGOs. We choose therefore instead to use the term 'policy subsystem'. Such subsystems consist of groupings of actors and institutions who engage in more or less routinized patterns of interaction, in the context of a more or less well-defined policy issue (Freeman, 1962; Howlett, Ramesh, & Perl, 2009; McCool, 1998). The actors and institutions in question may include government bodies as well as industrial actors and civil society groups.

While such subsystems have been found to play a crucial role in policy development and enactment in many countries (Lowi, 1969), the nature of the interaction and not least the degree of mutual commitment between the actors have been found to vary a lot – from closed, tightly woven 'iron triangles'(Cater, 1964) to loosely formulated 'issue networks' (Heclo, 1978). The literature contains a plethora of terms referring to largely similar phenomena (Jordan & Schubert, 1992; Waarden, 1992). In later years, the much-hailed 'shift to governance' (Kickert, Klijn, & Koppenjan, 1997; Kooiman, 2002; Rhodes, 1997) has put terms such as 'policy networks' and 'network governance' in the forefront. In this literature, however, the main focus is on largely non-hierarchical, self-regulating networks of actors that are operationally autonomous yet mutually interdependent (Schmitter, 2002). This seems inappropriate in the context of the present article, however, because our main interest in what is to follow is in legally mandated regulation and formal systems of government. The term joined-up government (Davies, 2009; Kavanagh & Richards, 2001; Pollitt, 2003) might be more descriptive, a concept that has been coined to describe the need of coordinating an increasingly fragmented public sector in order to tackle 'wicked' issues which are not the responsibility of any other department. This term however to a limited extent include private actors. Because of this, the more generic term 'policy subsystem' will be used henceforth, to denote ecologies of governmental agencies and private/civil society actors whose vital interests are related to the same policy issue, such as agriculture

or hydropower. We make no specific assumptions concerning the nature of the patterns of interaction inside of these subsystems. Our key aim is rather to make empirically grounded assumptions about how the regulatory and institutional set-up of each subsystem affects their relative degree of environmental policy integration, related to the environmental aims of the WFD.

The policy subsystems in question in the context of the present paper are hydropower, aquaculture, agriculture, sewage and waste water, and the processing industries. We assess the policy subsystems in terms of how their engagement and commitment to the WFD processes are perceived by actors in the system, as a proxy for actual 'integration of environmental concerns into goal structures'.

Policy integration reflects EU policy development on a more general level than environmental politics. It is essentially similar to 'mainstreaming', a concept that originated in gender policy (Bruno, Jacquot, & Mandin, 2006; Geyer & Lightfoot, 2010) and has since made its way into other policy fields, notably health policy. It was given a legal basis in the Amsterdam Treaty in 1997 (article 3.2 TEC). Mainstreaming is, alongside with benchmarking and the 'open method of coordination', a main feature of 'the new soft law governance' or the 'new governmentality' which has become staple in EU governance, as an alternative approach to the traditional 'community method' which is based on negotiated hierarchical regulation (Bruno et al., 2006). These have been termed as 'cognitive forms of intervention', which 'does not exert sovereign power to enforce rules' (*ibid*., p. 5). The implementation of the WFD however certainly involves an abundance of rule enforcement, in the form of regulatory instruments in the various areas of water policy. This apparent incongruence points the attention to a crucial feature of WFD implementation in Norway which will be a recurring theme in what is to follow.

Norway implemented the WFD not in the form of a law, but in the form of the *Water regulation*, in 2006. This regulation does not take precedence over the laws that mandate water policy measures (Andersen, 2013). Furthermore, whereas the Water regulation resides with the Ministry of the Environment, the laws that mandate actual measures are enforced by a number of authorities subsumed under several ministries. There is in other words no legally mandated institution for enforced coordination below cabinet level. Following this, 'policy integration' has an element of 'cognitive intervention' in the sense that successful implementation of the WFD to a certain extent relies on the compliance and active support of a quite broad and diverse group of operationally semiautonomous authorities.

These authorities furthermore exert their regulatory powers in the context of legal and institutional structures that have developed more or less independently over the years. The thrust of the present article is to demonstrate how these legal and institutional structures vary, and to explore how this variation affects the feasibility of achieving policy integration. How do the institutional structures and procedures in each policy area negotiate the tradeoffs between environmental goals and the primary aims of the policy area, such as power production or agricultural output? What kinds of legal and institutional arrangements may reasonably be expected to help or hinder vertical integration? Here we will investigate the scope and boundaries of the existing arrangements, how these arrangement mandate

enforced regulation, and if so, what are the potentials and limitations for such enforcement? In order to study this, we will analyze the policy areas along several dimensions;

- *Institutional structures*; Legal mandate for environmental regulation; level of government of regulatory agency; the location of the regulator
- *Policy instruments*; Regulation of activity; regulation of stressors; nature of policy instruments
- *Policymaking tradition*; Degrees of goal conflict with environmental goals in WDF; hierarchical or corporative traditions

As noted, measuring actual policy integration with any degree of accuracy is difficult at present, due to the fact that the first comprehensive round of planning has only recently been completed. Our dependent variable is, following this, the perceptions of involved actors concerning the degree of vertical integration. The article presents findings from a survey to all members of the RBD boards concerning the feasibility of reaching agreement on a number of water-related issues.

4. Methods

This article is based on a pragmatic-constructivist methodology (Gordon, 2009), in the sense that it analyses involved actors' interpretations of institutions as the 'rules of the game' of social life (North, 1990). Rather than seeing environmental policy integration in an objectivist light, as an entity measurable independently of subjective experience (Warren, 1992), the strategy of the analysis is to assess such integration by exploring the interplay between the institutional set-up of the water management system on the one hand, and the respondents' views on the degree of policy integration achieved in the various subsystems. Because the aim of the analysis is to investigate the effects on policy integration of specific institutional arrangements, the study can be seen as a 'plausability probe', which is which are an intermediary step between hypothesis generation and hypothesis testing (Levy, 2008, pp. 6–7). In such studies, a mixed-methods approach drawing on qualitative and quantitative data is often appropriate (Hammersley & Atkinson, 1995). Accordingly, the study makes use of three sources of data.

Firstly, a study of public documents was conducted in order to lay the foundations for describing and analyzing the institutional structures and policy instruments in the various policy subsystems. The documents included white papers and annual reports, as well as information materials describing the newly established water management system. The document study also included materials from the three RBDs that were selected for the case study. These materials included minutes from meetings in RBD fora, hearing documents from public and private actors, as well as the plans and documents that are mandatory outputs of the planning processes carried out by the RBDs in accordance with the Water regulation (documents on 'significant issues', Water management plans, action plans).

Secondly, we conducted a survey in two rounds to all members of the boards in all the 11 RBDs in Norway. The survey was conducted in 2013 and 2015 (digital survey distributed by e-mail in April 2013 and April 2015, analyzed by SPSS© statistics 22). The respondents

included representatives of municipalities, counties and regional offices of national agencies, including authorities responsible for agriculture, hydropower, fish-farming, environmental authorities, road and traffic authorities and others. The size of the RBD boards varies, from 12 to around 270 participants. In 2013, the number of respondents was 733, and 301 answered, giving a response rate of 41. In 2015, the number of respondents dropped to 231, a response rate of 31,5.

Due to the modest response rate, we conducted a test for sample selection bias, and found that all RBDs are represented, and there is only small variation in the response rate among them. 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). Although this bias is small, we will control for the respondents' affiliation in our analysis. This strategy should allow statistical inference even in light of the modest response rate.

Thirdly, semi-structured interviews were conducted with key actors in the three RBDs that were selected as cases. These include the coordinators of the three RBDs and of a number of SDs, as well as local and regional level politicians, various regional branches of state agencies, and administrative representatives from the Counties. We also interviewed actors from relevant NGOs and large businesses, including power companies. Altogether, more than 50 individuals were interviewed, and the interviews were transcribed. The interviews are used to improve our insights and thereby being better able to explain and elaborate upon the findings in the survey and document studies. The research has been carried out by [project title withheld in blinded MS]. The bulk of empirical research has been carried out by the authors.

5. Results

5.1. Perceived degree of policy integration

According to our informants, the policy subsystems vary a lot in terms of environmental policy integration. As shown in Figure 3 below, the members of the RBD boards tend to note that it is more difficult to reach agreement on issues to do with aquaculture, hydropower and agriculture, than what is the case with the processing industries and waste water. This pattern was reinforced in the second round of the survey, and especially so on the RBD level.

The results indicate that it is most difficult to reach agreement on issues related to aquaculture and hydropower, when such issues are raised ion the RBD level. Agriculture is the third most difficult issue. From 2013 to 2015, the share of informants who found it very difficult or difficult to reach agreement on these issues rose from 30% to 36% (aquaculture); from 25% to 38% (hydropower) and from 24% to 29% (agriculture). Agreement was on the whole seen as a lot easier to achieve on issues pertaining to pollution and waste water, in both periods. Note that perceptions about the difficulty of reaching agreement on the sub-district level vary somewhat. For agriculture, pollution and waste water, perceptions do not vary substantially between the RBD and the SD levels, and they change little over

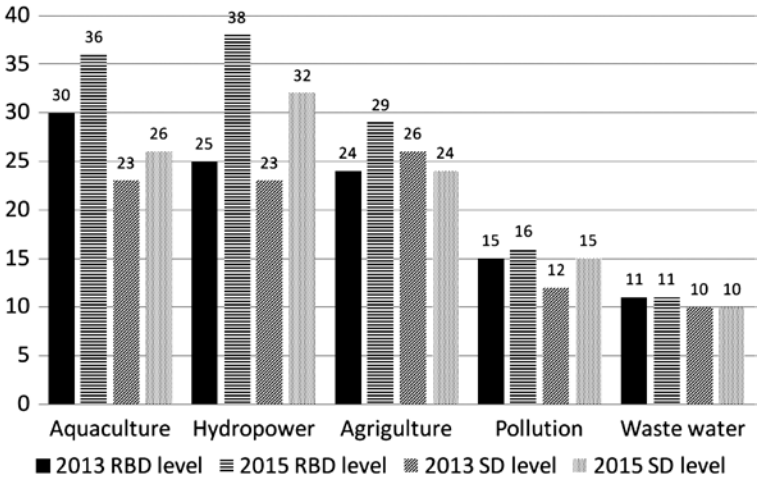

Figure 3. It is very difficult/difficult to reach agreement on issues related to the five policy subsystems*, on the RBD and the SD levels (Percentage, survey to the participants in the River Basin District Boards, 2013: N=301; 2015: N=231)
* 'Pollution' refers to pollution from the processing industries

time. It is seen as easier to reach agreement on issues pertaining to aquaculture on the SD level than on the RBD level. Note however the substantial increase in respondents who find it more difficult to reach agreement on hydropower issues on the sub-district level in 2015, as compared to 2013.

Key policy goals in the aquaculture, hydropower and agriculture subsystems frequently compete with, and in some cases directly contradict, environmental goals. The results reported in Figure 3 can be taken as a very coarse indicator of variations in vertical environmental policy integration. Why is it, according to the respondents, more difficult to reach agreement on environmental issues pertaining to aquaculture, hydropower and agriculture than in other sectors? In the following section, the regulatory and institutional set-up of the five policy subsystems in question is presented, along with the respondent's opinions. The results are summarized and discussed in the section that follows.

5.2. How can variations in vertical policy integration be explained?

Agriculture Although the Pollution act includes a general prohibition against all sorts of pollution, agriculture is exempted from this provision. The legal basis for enforced reduction of nutrient leakages from farm land is largely absent. As a consequence, economic incentives and voluntary measures are predominant means for achieving environmental policy goals in the agriculture subsystem[8]. Three mechanisms stand out as particularly important.

[8] Point source pollution from manure storage and silos is regulated by legal instruments, and is no longer an important pollution problem in Norway

Firstly, as a precondition for receiving general production grants, farmers need to fulfill a number of requirements, including the preparation of a fertilization plan for the farm. Secondly, there is an environmental program for the agriculture sector. The farmers may apply for grants provided they construct buffer zones along watercourses, avoid plowing in the autumn or implement other measures. Thirdly, local incentive schemes have been designed, aimed at stimulating environmentally sound investments, such as for instance constructing or repairing drainage systems or sedimentation ponds. These schemes are handled by the municipalities. Economic incentives are combined by environmental agreements and other voluntary programs, designed at the local level. These incentive schemes and regulations are handled by the agricultural authorities at national, regional and local level. The role of the municipalities is mainly to execute state policy.

The agricultural agreement is subject to annual negotiations between the Ministry of Agriculture and Food (MAF) and the farmers' associations. The total amount of money spent on the regional and local environmental programs is part of these negotiations. The profile of the four-year regional environmental programs is subject to consultation between agricultural authorities and the farmers organizations at central and regional level.

Among actors in the agriculture subsystem, there is a dominant perception of goal conflicts between agricultural policy aims and environmental aims. In particular, the stated policy goal of increased national foodstuff self-reliance is seen as irreconcilable with the WFD goal of dramatically reduced pollution. '(. . . .) there are limits to how much we can impose on agriculture and still expect an increase in food production' (County governor's agriculture agency).

Furthermore, central paradigms of agriculture policy that obstruct the implementation of the goal of good water status are not called into question or discussed. A common contention among the informants is that current agricultural policies favors monoculture quite strongly, by supporting highly intensive production of grains and vegetables in low-lying areas, and grass production in hilly terrains. This mode of production is however less than ideal from an environmental point of view, as it may exacerbate problems related to sedimentary pollution caused by erosion, as well as eutrophication caused by increased need for fertilization. Furthermore, the preference for voluntary incentive-based policy measures above hard regulatory measures is seen by many as inadequate. As a representative of a farmer's organization expressed with reference to the process of formulating the regional environment programs:

> '(. . .) *you are sort of checkmate before starting, because there is the white paper (on agriculture policy) which sets the guidelines for how farming should be in Norway. This white paper defines a tool kit and presupposes continuation of the so called channeling policy: The lowlands shall have a monoculture of grain, and the livestock districts shall keep the number of domestic animals*'.

The local and regional incentive schemes are adjusted to the WFD implementation. The grants given for reducing discharges of nutrients are increased in counties facing problems of eutrophication. Considerations about potential distributional effects on farmers' income are effectively limiting both the size of the reward for environmental friendly farming and

the use of legal instruments regulating the farming in catchment areas facing severe problems. The policy formulation processes is dominated by policy subsystem actors including government representatives and farmers. Actors representing other interests and perspectives are largely excluded. As a consequence, environmental considerations are to a great extent relegated to a less prominent status than that of the primary aims of the policy subsystem. The resulting degree of vertical policy integration is, following this, quite limited.

Aquaculture Fish farming requires a license. The licensing process is mandated by the Aquaculture Act from 2006. The main objective of this act is to secure profitability for the industry in a sustainable way. Licenses are granted subject to approval by a number of authorities including the Environmental Department at the County Governor's office, the Food Safety Authority, the Norwegian Coastal Administration and the WRED, in addition to the relevant municipalities. A 2010 reform delegated the responsibility for issuing aquaculture licenses mandated by the Aquaculture Act to the County Councils. The license period is 5 years, and environmental stipulations may be included in the license. All in all, the licensing process is quite complex and involves several government agencies on three levels of government.

According to the informants, goal conflicts seem to be particularly salient in the Aquaculture subsystem. These conflicts are played out in the context of a regulatory structure that is, as noted, tenuous in terms of the status of the Water regulation. Because the Water regulation is not mandated by the Aquaculture Act, the aquaculture authorities contend that it cannot be applied in individual licensing processes. Doing so would imply 'a legal short-circuit' according to an official. This means that new activity may well be permitted as long as it doesn't cause any deterioration of the respective water body. If deterioration is expected, exemptions can be made pursuant to art. 4 §7 of the WFD of the Norwegian Costal and Fisheries Ministry, since licensing should be carried out based on the Aquaculture Act (Interview 04.02.2013). As a consequence, vertical policy integration in aquaculture has been problematic (Indset & Stokke, 2014). This applies not just to case-handling of new aquaculture licenses, but also classification and impact assessment of significant pressures. There has been a continuous conflict between the aquaculture authorities and the County Governor on how to characterize and assess influences from aquaculture.

Hydropower The Norwegian State holds several roles in the management of water resources. On the one side, the state owns a number of hydropower plants as well as large parts of the hydropower grid, and on the other side it is also the regulator and the licensing authority for hydropower production[9]. The Ministry of Petroleum and Energy (MPE) is responsible for the energy policy and the energy system, including hydropower. Two of the most important tasks in Norwegian hydropower management are the issuing of licenses for

[9] State responsibility for electricity transmission and ownership of the grid is managed through a state owned enterprise called Statnett. The tasks as hydropower plant owner and an actor on the free energy market is handled by a state owned company called Statkraft. The state's ownership of Statkraft is managed by the Ministry of Trade and Industry.

new hydropower production, and revision of terms (including environmental) put down in existing licenses. Revisions are a separate legal procedure involving a reassessment of the legal terms and requirements set out in licenses every 30 and 50 years, but not a revision of the license itself. In Norway, the licensing authorities for hydropower are the Parliament and the Government, the MPE and their subordinate agency, the Norwegian Water Resources and Energy Directorate (WRED). Other Ministries and subordinate agencies, like the Ministry of Environment (ME) and the Norwegian Environment Agency (NEA), have important roles as advisors in the case handling procedures, but they are not considered a part of the licensing authorities.

The WRED is responsible for managing the main regulatory instruments for hydropower[10]. WRED is also charged with the task of issuing regulations, to make decisions in individual cases and to perform preparatory procedures for cases to be resolved by the MPE. Furthermore, it calculates the quota arrangements for the energy market and is the supervisor of hydropower production. As for the revision of terms set out in existing licenses, MPE is the final decision-making-authority, while the WRED prepares the cases and provides proposals. Thus, much of the case-handling and all the decision-making authority is kept within the subsystem licensing authorities. The implication is that whereas the state's overall engagement in hydropower is shared between the MPE and ME and their subordinate agencies, the regulatory powers are held by the energy authorities alone. As a result, the mediation between environmental goals and the key aims of the subsystem is, at the end of the day, in the hands of the energy authorities.

The informants regard the procedures required for revising the terms of hydropower licenses as particularly rigid and cumbersome. According to WRED informants, this can partially be explained by conflicting policy objectives. Norway has committed itself to increased renewable energy shares, and is thus looking to expand hydropower production. The government has instructed the WRED to continued hydropower licensing. Not least, the delegation of RBD authority tasks to the Counties has brought up the issue of where to define the environmental objectives in Management Plans that may affect environmental terms granted in existing licenses. While these issues have been in the control of the state executives and reserved for the revision procedure, the WFD suggests that such questions should be dealt with in the Management Plans.

The processing industries According to the Pollution act of 1983, industrial plants that discharge pollutants to air or water need to apply for a pollution license to be able to operate. These licenses are granted by the NEA. Licenses for smaller plants are granted by the County Governor's office. The pollution license is a highly 'flexible' regulatory instrument, in the sense that it provides considerable leeway for direct intervention. Firstly, §16 of the act empowers the NEA to lay down stipulations as preconditions for being granted a license. Such stipulations may include measures for pollution abatement or damage reduction,

[10]The Energy Act and the Water Resources Act. The WRED assists the Ministry of Petroleum and Energy in managing the Industrial Licensing Act and the Act Relation to Regulations of Water courses

energy efficiency, filtering/cleaning measures or recycling. Furthermore, according to §18 of the pollution act, licenses can be revoked by the NEA and the licensee can be presented with entirely new preconditions for being granted a license. The polluter may for instance be required to implement new pollution abatement technologies that were not available at the time when the original license was granted. Licenses may also be revoked if the environmental impacts of the industrial activity turn out to be substantially different or more significant than expected when the license was granted. Furthermore, requirements of different severity may be applied to similar plants in different locations, in case the sum total of stressors to the water body in question is greater in one location than in another. Licensees are required to monitor and report on their discharges, production volume, energy consumption and waste disposal.

Compared with the regulatory processes in the other subsystems described above, the licensing process mandated by the pollution act is not very complex. The informants underscore that the licensing process and the legal mandate provides the environmental authorities with a great amount of discretionary powers. At the same time, point-source pollution from the processing industries is not regarded as being among the most prominent threats to the aquatic environment in Norway (Source: Vannportalen, 2013).

Sewage and waste water Discharges of waste water require an allowance, or a pollution permit. Allowances for single households, small settlements (less than 50 pe) and towns (less than 2000 pe to fresh water/10 000 pe to ocean) are granted by the municipalities. The County Governor's office, which is a multi-purpose regional authority subsumed under several ministries, grants allowances for larger towns and cities. National and local regulations define the standards for waste water treatment and the maximum allowed limits of discharges. As for discharges from smaller settlements, the municipalities can decide local regulations covering the whole or parts of the municipality. They can also demand that households get connected to the municipal waste water pipelines, if this is not too expensive. All municipal expenses are covered by waste water fees. The system of pollution allowances and local regulations constitutes a highly flexible regulatory regime, both in time and space. The regulations can adjust to new technologies as well as to the vulnerability of the recipient.

Local waste water policies are often laid down in long-term waste water plans. These plans describe the need for upgrades and extensions of the waste water treatment system, the necessary economic and professional resources are identified, and a time schedule is formulated. The planning process is dominated by engineers, but the final decision is made by local council members.

The respondents report on a high degree of environmental policy integration in the waste water subsystem. This is not too surprising, because the WDF goal of good ecological status in water bodies is shared by key actors who deal with waste water. The aims of waste water policy are not perceived as in any way conflicting with WDF aims. On the contrary, the implementation of the WFD is to a large extent perceived as a continuation of existing policy. The management plan of the pilot areas and the WDF work in general is

used to defend the existing practice. In cases where members of the target group do question the requirements; '. . . we use it [the WFD] for all it is worth' (waste water manager at municipal level).

Furthermore, the WDF planning processes were in several cases found to have influenced municipal waste water policy and practice. Within the pilot RBDs, the WFD processes seem to have been a key driver for the instigation of local waste water regulations, or for revisions of existing regulations. These regulations have in many cases imposed stricter requirements for waste water treatment in sparsely populated areas. We also observed examples of minor adjustments of waste water investment plans, including accelerated pace of investments as well as changes in prioritizations.

The waste water policy subsystem has a unitary regulator vested with sufficient and flexible regulatory powers, and the WFD aims seem to have been incorporated into policy-making and practice. Even though agriculture is a more significant stressor to the aquatic environment than waste water, we observed that the waste water subsystem actually takes on the bulk of the efforts to counter eutrophication. As expressed by a coordinator of the local WDF-work in one municipality:

> '(. . .) *we do still lack the opportunity to do anything with the agriculture, as long as the state do not put in requirements in the agricultural settlement (negotiations with the farmers organizations) (. . .) Regarding waste water from sparsely populated areas, there we have laws and regulations making it possible for us to do something*'.

6. Discussion

The brief exposition in the preceding section has shown that the five subsystems vary tremendously in terms of their regulatory frameworks and institutional set-ups. Table 2 summarizes a few key features presented so far.

Institutional structure Variations in the institutional structure of the five policy sub-systems seem highly significant for explaining the variations in environmental policy integration identified earlier. Three indicators are included in the table. 'Legal mandate' refers to the legal instrument that mandates environmental regulation in each subsystem. The Water regulation does not provide a legal mandate for enforced vertical policy integration by the environmental authorities. Mandates for environmental integration needs, as a consequence, to be found in other laws.

The legal regimes in the five policy subsystems vary a lot in this respect. Whereas there is a clear and unambiguous mandate for environmental regulation in the waste water and processing industry subsystems, the situation is somewhat different in the tree other subsystems. In agriculture, the absence of a legal mandate for regulatory intervention should be noted. Agriculture is exempted from the provisions in the Pollution act, and there is no 'Agricultural act' in existence to mandate coercive regulation. As for aquaculture, it should be noted that the Water regulation is mandated in the Pollution act, the

Table 2
Key features of regulatory frameworks for WFD relevant issues in five policy subsystems Source: Document study by authors

	Institutional structure			Policy instruments			Policymaking tradition	
	Legal mandate	Predom. level of government	Regulator	Regulation of activity	Regulation of stressor	Nature of instrument	Degree of goal conflict	Hierarchical/ corporative
Agri-culture	None	Regional	General-purpose government	None	None	Incentive-based	High	Corporative
Aqua-culture	[Aquaculture Act]	Regional	Mixed	License	License terms	Flexible	High	Hierarchical
Hydro-power	Water resource act	National	Subsystem authority	License	License terms	Time-limited	High	Hierarchical
Processing industries	Pollution act	National/regional	Environmental administration	None	Pollution permit	Flexible	High	Hierarchical
Sewage and waste water	Plan & building act, pollution act	Municipal	General-purpose government	Local regulations	Local regulations, pollution act	Flexible	Low	Hierarchical

Water resource act and in the Planning and building act, but not in the Aquaculture act. Some of our informants have noted that this may partially explain why the aquaculture policy subsystem to a considerable extent has been able to resist environmental policy integration. In the hydropower subsystem, however, the fact that the water regulation is mandated in the Water resource act, implies that the regulator has a clear legal mandate for environmental regulation.

There seem to be no grounds for assuming that the varying degrees of vertical policy integration reported by the respondents can be explained by variations in the predominant level of government of the regulator. We would however note that the regulatory authorities in the Processing industries and Sewage and waste water subsystems seem to enjoy a higher degree of autonomy vs. the polluters than what is the case in the Aquaculture and Hydropower subsystems. In particular, the fact that pollution permits are granted by the environmental administration, whereas hydropower licenses are granted by a subsystem authority could possibly explain some of the perceived variation in environmental policy integration in these subsystems.

Policy instruments As for regulatory instruments, 'regulation of activity' and 'regulation of stressor' refers to the instruments available for regulating the activity in question and/or the associated stressors to the aquatic environment. The absence of either in agriculture should be noted, and this could potentially explain to some extent why agriculture is seen as one of the subsystems marked by the lowest degree of vertical policy integration. Note also the difference between the Processing industries subsystem on the one hand, and Aquaculture/Hydropower on the other. There is no license as such for running an industrial plant. Rather, the object of regulation is the environmental stressor itself. In Aquaculture and Hydropower, however, the environmental stressor is regulated through the introduction of terms in a license which otherwise has the activity itself as the object of regulation. This could possibly contribute to explaining why the Processing industries subsystem is seen as more 'integrated' than Aquaculture and Hydropower. Possibly, licenses that balance environmental aspects with the primary aims of the activity in question are less prone to ensure environmental integration than those that target the pollution directly.

The *nature of the regulation* refers predominantly to the scope for regulatory intervention. In agriculture, policy measures are predominantly incentive-based. The County governor may issue binding regulations, but this instrument is seldom used. As for hydropower licenses these are, as noted, time limited. This constitutes a major impediment to regulation, because the license terms are not open to revision until the end of the time limit – which may be as long as 50 years. This is very much in contrast to the scope for intervention in the Processing industries and Sewage and waste water subsystems. The term 'flexible' implies that the regulator is very much at liberty to introduce new environmental demands to the polluter. All in all, variations in the nature of the regulatory instruments seem to fit quite well with the variations in vertical policy integration reported by the respondents.

All in all, variations in the policy-making traditions in the five sub-systems, in conjunction with variations in the institutional structures and policy instruments available seem to

provide feasible explanations for the differences in aquatic environmental policy integration reported by the informants. The corporate, incentive-based system in Agriculture, the tenuous legal basis for environmental regulation and high degree of goal conflict in Aquaculture, and the rigid licensing system in Hydropower, which is furthermore managed by the key subsystem authority, are among the observations that seem to provide parts of the explanation for why these subsystems are seen as lagging behind. On the other hand, the strong regulatory instruments and the relative autonomy of the environmental regulators in the Processing industry and Sewage and Waste Water subsystems seem to provide a more promising basis for vertical environmental policy integration.

These observations correspond to the analysis of Andersen (2013), who identifies specific legal areas where the Norwegian regulatory framework is insufficiently adapted in order to secure a legal fulfillment of the environmental quality norms of the WFD. The WFD (and the Norwegian water regulation) requires that deterioration of the aquatic environment must be prevented for both ongoing and new activities. According to Andersen (2013), the no-deterioration requirement of the WFD is applied differently by the regulatory agencies. While the pollution authorities apply the no-deterioration requirement as material limits for the licensing of discharges in each case, the hydropower authorities seem to have incorporated a general reference to 'the exemption provision in the Norwegian water regulation §12', without explaining the specific assessments that were made in each case.

7. Conclusion

Pending the availability of hard data to assess each policy subsystem's relative contribution to WFD goal achievement, the observations and contentions made by the informants possibly provide the best picture of the present situation currently available. While this picture is not unequivocally bleak in terms of the feasibility of achieving environmental policy integration, it does give grounds for concern regarding Norway's potential for achieving the WFD's aims. Institutional and regulatory issues seem to be a significant factor in this regard. These issues are often found in the vertical silos.

In Norway, issues to do with the aquatic environment have the potential to set off potent conflicts of interest. As noted earlier, some of Norway's key industries cause adverse environmental impacts on water, including prominently aquaculture, agriculture and the hydropower industry. As a consequence, the economic and social impacts of restrictive environmental regulations, in terms of not least export revenues and employment in rural areas, may potentially be very substantial. Furthermore, environmental policies that lead to a reduction of hydropower output may hamper Norway's ability to reach the goals for increasing share of renewable energy production laid down by the EU renewable energy directive (Directive 2009/28/EC). The implication of this is that environmental regulations required to meet WFD aims may meet with opposition not just from resourceful business actors, but from various public authorities as well.

The analysis in the present paper indicates, however, that this kind of situation seems to require a system of governance, which is a great deal more consistent and authoritative than is the case today. Legal inconsistencies seem to provide 'loopholes' for shirking environmental demands. The fact that the Water regulation is subordinate to the laws mandating the measures, that the Aquaculture act does not mandate the Water regulation and that article 12 in the Water regulation is used somewhat indiscriminately by the hydropower authorities suggests that conflicts of interest need to be addressed with a more consistent and unambiguous legal framework than the one currently in place. Again, this is a rather clear-cut indication of how vertical and horizontal policy integration is linked together. Furthermore, the use of a network-like system of 'voluntary' coordination may prove less than ideal in a situation where a number of actors are motivated to shy away from the most costly measures. Such a course of action would seem to be especially tempting in a policy subsystem marked by absence of binding regulation – agriculture. It has become conventional wisdom that municipalities carry a disproportionate part of the costs related to diffuse source nutrient leakage, and the incentive-based system of regulation in agriculture probably has a lot to do with this.

This is not to say that environmental aims are not taken into account by decision-makers in the aquaculture, hydropower and agriculture subsystems, but it remains an open issue to what extent this can be attributed to the system for 'horizontal' environmental policy integration – the RBDs and the SDs. For the time being, their most important functions seem to be one of deliberation and knowledge sharing, to a lesser extent reaching mutually binding and enforceable agreements. The regional coordinators – the counties – are probably (and quite paradoxically) the least powerful actors in the entire system, in the sense that they hold very limited formal powers over the measures that have to be implemented. As long as regulatory power largely remains in each subsystem's domain, the question is whether this is sufficient to achieve the aims laid down in the WFD. Thus, this case study has raised the important question of to what extent horizontal policy integration depends on legal conditions and adaptations. There is certainly evidence suggesting that legal adaptation fosters effective implementation. But then again, other case studies suggest that legal adaptation in Norway most likely would have triggered veto holders (Indset & Stokke, 2014). Thus, this study exposes that the concept of environmental policy integration seems to rely on institutional trajectories of the pre-existing political system. In this sense, the results of the study highlights more general dilemmas related to key features of EU environmental governance, notably "mainstreaming" and "policy integration" (Bruno et al., 2006). Effective implementation of political commitments such as the aims laid down in the WFD depends crucially on the set-up of institutional structures and regulatory instruments in each member state government – not just on the degree of political commitment.

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